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**Project Workshop n°2 – Rabat, 20 October 2009**

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Executive summary

The general objective of ESTEEM is to enhance and strengthen the links between the Maghreb and EU transport related research systems, focusing on the specific theme of transport safety and security. The report on the first workshop (held in Batna in June 2009) combined deliverables 3.1 and 3.2 related with sub-areas 1 and 2. This report combines deliverables 3.3 and 3.4 related with sub-area 3 (Information systems for transport safety and security) and sub-area 4 (Safety aspects for infrastructure design) and provides an overview of the second workshop organized in the framework of the project.

The objective of these activities is to bring stakeholders, technical experts, researchers, institutions and companies, dealing with the selected sub areas, from France, Italy, Spain, Morocco, Algeria and Tunisia. Especially the second workshop focused on the last two sub-areas selected in the work package 1 of ESTEEM:

- **Sub-area 3 - Information systems for transport safety and security**
  - ITS for road safety;
  - ITS for safety & security of port operations;
- **Sub-area 4 - Safety aspects for infrastructure design**
  - rail crossing safety;
  - vulnerable users;
  - safety audits & inspections;
  - maintenance.

Both European and Mediterranean institutions and companies have been invited to actively participate to the workshop and to join the network created by the project.

The workshop was hosted by the Moroccan partner of ESTEEM (Ecole Mohammadia d’Ingénieurs) and was opened to the participation of local and regional stakeholders, which was invited to present their remarks about the topics treated. The CNPAC (Moroccan National Comity for Prevention of Accidents of Circulation) was interested to the work of ESTEEM and has manifested his interest in collaborating to the organization of the second workshop. Therefore, EMI co-organized the workshop with CNPAC in its locals.

The workshop was organized in four sessions: two related with sub-area 3 (SA3) in Europe and Maghreb countries, and two others related with sub-area 4 (SA4) in Europe and Maghreb countries, followed by a debate session.

The discussions in this workshop provided useful and complementary indications to those of the first workshop in order to elaborate, after the surveys, the roadmaps for future researches on these topics.

Discussions with the participants to the workshop showed that the numbers of road accidents in Maghreb are still very high as compared to European partners countries: about 10 times more in Maghreb (1.156 in Algeria, 1.302 in Tunisia and 1.749 killed per million vehicles in Morocco) than in Europe (130 in France, 134 in Italy and 160 killed per million vehicles in Spain). In Maghreb countries, the number of killed didn’t even show a franc decreasing slope since 2001).

The human factor is the most important cause of accident (more than 90% in Maghreb countries); however information systems may be used efficiently in safety and security of transportation systems, especially in their management and control.

The complementary papers presented in the workshop sessions presented various tools used in safety and security management from both sides of the Mediterranean Sea. They
showed that conventional tools such as educating, training, communicating, sensitizing, enforcing, managing black spots must naturally be pursued and developed. Also, common tools of safety and security of transport in Europe should be immediately implemented in Maghreb countries, including legislation and road code.

Sub-area 3 sessions showed that the modernization of the information technology of transport systems in Maghreb will certainly help achieve the goals of a better management, control, education and training for an improved safety and security of transport systems. ITS systems presented during the workshop, may be helpful for that purpose, especially for electronic administration, electronic control, and driver assistance. In Maghreb countries, there is a lack of ITS hardware for signalisation, and traffic management and control of road transport. But these tools start being used in urban transport with the last structuring projects such as the tram of Rabat. TIC and ITS are however intensively used in rail, air, and maritime sectors were international standards imposes their use.

Sub-area 4 sessions showed that infrastructure management can be improved by the use of new technologies, intelligent infrastructures for enforcement, travel information, emergency management, and real time security assessment. Finally, infrastructure design safety standards seem to be missing, or unused, in some Maghreb countries. Especially, the workshop showed that specific safety audits and safety impact studies were not done for the tram in Rabat. Therefore, this aspect, of taking account of safety in the studies phases of projects through standards, is a major recommendation among infrastructure actions for these countries.

Cooperation between university and professional stakeholders appeared to be vital to improving safety and security of transport systems through research, higher education and professional training.
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1 Introduction

This document is prepared for the Directorate-General for Research of the European Commission as deliverable of the project ESTEEM (Enhancing Safety and security aspects in Transport rEssearch in the EuroMediterranean region).

The general objective of ESTEEM is to enhance and strengthen the links between the Maghreb transport related research system and three Mediterranean neighbouring EU countries (namely France, Italy and Spain), focusing on the specific theme of safety and security of transport systems and infrastructures.

In order to do this, it is deemed necessary to implement a strong coordination action among the relevant stakeholders in the two regions, ensuring that their future research policies on transport are defined at regional level and not only at the level of the individual countries.

The specific objective of the project is bringing the partners to share the identification of priority common research themes, responding to identified needs, which should be investigated in future research actions to be carried out at regional level. Thus, the project will contribute both to the definition of the future research roadmaps for both the FP7 Transport programme and the Mediterranean Partners Countries (MPCs) governments and to the coordination of high quality research and policies on transport in the countries involved in the project in the area of safety.

The strategy implemented to achieve these objectives foresees four main Work Packages, as follow:

1. identification and selection of thematic sub-areas to be investigated (WP1);
2. analysis of the above mentioned sub-areas in the form of structured surveys (WP2);
3. exchange of results and sharing of the knowledge acquired, in the form of workshops and production of roadmaps for future research actions (WP3);
4. creation of a Network among stakeholders and the project participants and a series of Dissemination Activities (WP4).

This deliverable relates with the activities of the Work Package 3 (Workshops). The workshop organized in Rabat (Morocco) aimed at highlighting the role of new technologies and the infrastructures in the safety and the safety of transport systems, in order to complete the vision already built through the phase of the literature review (desk analysis realized in WP2), to compare results and to meet by the way some of the key stakeholders (policy makers, researchers, practitioners, associations, etc.), some of whom interviewed during the surveys (WP2). All these entities were invited and participated to the workshop.

The goal was to exchange a maximum of views on the issue of Information systems for transport safety (sub-area 3 of the project) and about the safety aspects for infrastructure design (sub-area 4 of the project).

Then, the sub-areas concerned by the workshop were:

- Sub-area 3 - Information systems for transport safety ➔ Deliverable 3.3
  - ITS for road safety;
  - ITS for safety & security of port operations;
- Sub-area 4 - Safety aspects for infrastructure design ➔ Deliverable 3.4
  - rail crossing safety;
  - vulnerable users;
  - safety audits & inspections;
  - maintenance.
The Scientific Committee of the workshop tried to balance presentations between the European advanced experience and the practice of safety and security of transport systems in the Maghreb. Complementary topics have been chosen to cover the Intelligent Transport Systems for safety and their possible use in the short term and long term, and to discuss safety aspects for infrastructure design.

Finally, the workshop in Rabat was an occasion to complete the basis for the roadmaps to be prepared as final result of ESTEEM.

2 Workshop program

2.1 Program

The workshop was organized in four sessions (detailed workshop program is given in Annex I) accompanied by questions-responses and discussions. The topics of the four sections are the following:

Deliverable 3.3

1. Etat de développement des TIC en Europe (State of development of the ITS in Europe)
2. Etat de développement des TIC au Maghreb (State of development of the ITS in Maghreb)

Deliverable 3.4

3. Conception des infrastructures et de la sécurité des systèmes de transport: Partenaires ESTEEM (Infrastructure design and transport systems safety in the ESTEEM Partner Countries)
4. Infrastructure et la sécurité des systèmes de transport au Maroc (Infrastructure and transport systems safety in Morocco)

2.2 Participants

Invitations were sent to the ESTEEM partners, to stakeholders (decision makers and agencies at central and local levels) in Morocco, and to researchers from several universities and institutions. The detailed list of participants is given in the Annex II. A summary of guests is reported in the following paragraphs.

2.2.1 Foreign guests

CTL – Research Centre for Transport and Logistic, “Sapienza” University of Rome, Italy
IMED – Mediterranean Institute, Italy
TRAKTEPLAN, S.A., Spain
INRIA – Institut National de Recherche en Informatique et Automatique, France
ISTLS - Université de Sousse, Tunisia
Université El Hadj Lakhdar de Batna, Algeria
INRETS – Institut National de Recherche sur les Transports et leur Sécurité, France
PAT - Asociación de Prevención des Accidentes de Tráfico, Spain
STA - Spanish Traffic Engineers, Spain
ALSA – Coach and bus services, Spain and Morocco

2.2.2 Moroccan guests or their representative (Public Administration)

Ministry of Equipment and Transport
Ministry of Industry, Commerce and New Technologies
Permanent Secretary of the National Committee of Prevention of Road Circulation
General Director of National Security
General of Army Bodies Commandant of the Royal Gendarmerie
General of Division Inspector of Civil Protection
Director of Hospitals and Ambulatory Cures
Director of Roads of MET
Director of Information Systems of MET
Director of Road Transport and of Road Safety
Director of the Strategy and of the Transports Coordination
Director of the Mercantile Marine
General Director of the Local Communities
Regional Director of the Equipment and of the Transports of the Region Rabat-Salé-Zemmours-Zaërs
General Director of the Marocan Federation of the Insurance Societies
Colonel Inspecteur de l’Armée du Train Forces Armées Royales
Director of the Urban Agency of Rabat
Wali of the Region of Rabat-Salé-Zemmours-Zaërs
President of the Council of the Municipality of Rabat
General Director of the Agency for Settlements of the Valée du Bouregreg
President of the Council of the Municipality of Fes
General Director of the Office for Railways

2.2.3 Moroccan guests : representative of universities
Ecole Mohammadia d’Ingénieurs
Ecole Hassania des Travaux Publics
Ecole Nationale Supérieure d’Informatique et d’Analyse des Systèmes
Institut National de Statistique et d’Economie Appliquée
Institut National des Postes et Télécommunications

2.3 Opening session
The opening of the workshop included:

• A speech of the Minister for the Equipment and Transport (read by the Permanent Secretary of the CNPAC – see Annex III)
• Welcome on behalf of the Director of Ecole Mohammadia d’Ingénieurs (see Annex IV)
• Presentation of ESTEEM project and the goal of the workshop by Antonino Tripodi.

2.4 Deliverable 3.3 - Session 1 - State of development of the ITS in Europe
Ole Thorson: Traffic Safety in Spain, Objectives and results (PAT, Spain)
Mr. Ole Thorson is Civil Engineer, Ph.D., President of P(A)T and President of the International Federation of Pedestrians.

Mr. Thorson presents the objectives of the Spanish Traffic Accident Association P(A)T:

- Avoid personal injury accidents, adjusting conflicts between users.
- Attend the need of the victims and especially the affected persons (parents, family, and friends) who suffer from loss of a beloved person or have to take care of one the rest of life.

Then the evolution of safety in Catalunya and safety actions in Spain was presented. It can be summarized by:

- First speed limits and safety belt use in the end of 70’s.
- Next move started in the Traffic Act in 2002 with stronger limits on alcohol and excessive speed. Debate on license with points.
- In 2006 the actual system of License with points (12 points) and loss of license in special cases.
- In 2008 is entered in the Penal Act that it is clear a penal behaviour to drive with more than 1.2 g/l and with an excess of 80 km/h over speed limit (60 km/h over in urban areas).
- Extra police controls on-road have been established.
- Systems of education for drivers who lost points are spread over the country, and P(A)T takes active part (especially in Catalunya) in this education process.
- A great number of fixed and mobile Radars are being installed.
- Better treatment of road and street black spots.
- The ITV (Technical inspection of vehicles) is getting better and better.
- P(A)T is present in many public participation commissions. At State level, Regional level and municipal level.
- P(A)T forms part of groups to define mobility and safety policy in municipalities.
- P(A)T is participating in the public debate with messages to the society and press. The association is heard in TV, Radio and read in newspapers.
- P(A)T is active with proposals to political parties before each public elections.
- P(A)T organizes conferences and congresses on safety, prevention and victim items.

Spain actions have allowed to reduce traffic deads by a half between 2000 and 2008.

Claude Laurgeau, What are ITS (Mines Paris, France)

Claude Laurgeau explained what Intelligent Transport Systems are. ITS (Intelligent Transport Systems) qualifies the powerful movement of innovation in transport, resulting from the progress induced by new communication and information technologies. The large industrialized countries have their own ITS association (ITS America, ITS Japan, ERTICO for Europe, ITS France, TTS Italy, ITS Spain, …) and find themselves each year at the time of the world congress ITS World which moves each year on one of the three areas of the sphere, North America, Western Europe and East Asia.

Claude Laurgeau exposed the technical, economical and societal aspects of ITS by illustrating in his presentation of many examples. He especially described the principles behind the intelligent vehicle, and its impact on traffic congestion reduction and high impact
on road safety since technological devices have much faster reaction time than human can have (1/1000 of a second versus about 3 seconds for a human).

**Habib Hadj-Mabrouk, Analyse des risques des systèmes de transport intelligents (INRETS, France)**

Habib Hadj-Mabrouk discussed the factors affecting the development of the ITS, that are advanced applications which, while not representing the intelligence as such, aim at providing innovating services related with the transport modes and the management of circulation, and to make possible for various users to be better informed and to make a surer use, more coordinated and more “intelligent” of the grid systems.

Hadj-Mabrouk explained however that these ITS, even if they facilitate the increase, the treatments and the exchanges of information, are not the guarantors, in themselves, and can raise new problems which require a detailed attention. Various questions can be posed: How to validate, approve and certify the hardware and software equipment implied in the ITS? Is it necessary to set up an organization or independent engineering department (organization of certification) specific for ITS applications? How to make sure that ITS equipment is well installed, well maintained and suitably used to avoid potential risks? How to guarantee that exploited ITS equipment does not compromise the health and the safety of people and environment? The ITS are generally considered to satisfy technical specifications adopted in accordance with the regulation in force. Are there relevant standards devoted to the ITS? How to make sure of the correct operation of the applications and/or ITS services without taking into account and treating the data in personal and confidential matter? The data and the recordings of the ITS owe being protected from any abusive use, in particular the not authorized accesses, the modifications or the losses of information. How to take into account the problem of interworking of the ITS? How to take into account the personal elements related to the exploitation of the ITS? How to make sure that the exploitation of the ITS material equipment and software does not induce potential risks or dangers on people and/or environment?

Habib Hadj-Mabrouk convinced the audience that many ITS devices do not give all the guarantee of security, and there is still a lot to be done before that some ITS will be effectively used in practice.

**Antonino Tripodi, State of development of ITS in Italy (CTL, Italy)**

Antonino Tripodi focused on the existing ITS systems that can be immediately implemented. The main developments relate with the rail sector in which systems for safety and security are in the vanguard. Also for road safety, several systems exist in order to provide information, limit access to certain zones, protect road users, facilitate enforcement, etc. Also the research field is very active in Italy.

Despite several existing systems, the level of awareness of decision makers and public administrations about the existing systems to be implemented is still low. He noted the absence of a clear regulation about the systems to be implemented and about the standards to be respected. Guidelines for the ITS implementation exist but are very few used. The costs of some systems are still too high and, as their benefits are not clearly explained, they discourage the transport managers to invest in this field.

Main opportunities in this field relate with several experiences gained at national and European level. Technologies are now ready for the implementation of complicate systems like those allowing the communication between vehicles and between vehicles and the infrastructure. Security tools are also very effective and ready to be used in several transport fields (e.g. systems used on the national railway can be easily transposed to road transport field).
Main threats are related with the change of behaviour that some systems can produce (e.g. road navigators can be a source of distraction for drivers, the use of adaptive cruise controls on a large scale can change the usual driver habits). Also the costs for implementing the ITS systems can block their development, if a support from central administration will not be foreseen. Quality of the services provided by third parties has to be controlled in order to make sure that it is accurate and is not introducing any risk.

2.5 Deliverable 3.3 - Session 2 - State of development of the information systems in Maghreb

Hachemi Mabrouk, Road safety in Tunisia (ISTLS Sousse, Tunisia)

Hachemi Mabrouk presented the road network in Tunisia and its infrastructures and made an analysis of the accidents typology in Tunisia during ten last years and a comparison of the accidents typology in the countries close to the Maghreb and of Europe. Even if during these last years there was an important reduction in the accidents in Tunisia compared to the previous years according to the official statistics, the rate of accident compared to the number of the registered vehicles remains always important in comparison with other nearby European countries.

A reading of the state of the art of road safety in Tunisia and an attentive analysis can help to include/understand certain causes of this strong accidents typology which has very heavy consequences on the economy and the society. His analysis gives place to proposals for a project and research topics in the field of the safety of transport which are necessary and useful in this moment.

A. Chahli, Contribution of the NTI to the road safety in the Ministry for the Equipment and Transport (DSI/MET, Maroc)

Conscious of the contributions of new information technologies in the field of transport, the Moroccan Ministry for the Equipment and Transport began the realization of innovating projects (intelligent systems of transport) as regards to speed control, vehicle inspection, and delivery of electronic driving licenses and the automobile licenses. Through the realization of these projects, the Ministry for the Equipment and Transport aimed three types of objectives:

- The modernization and the improvement of the services to the users through the dematerialization of certain administrative procedures, the raising of the moral standard of the public utility, the adoption of international standards in the fields concerned as well as the creation of a synergy among various operators of the transport sector.

- To fight the road non safety by the observation and the automatic treatment of the infringements, the management of the application of the regulation in force, the management of the vehicles inspection and the e-teaching of the road code.

- The control of information by maintaining databases reliable for monitoring the management of the drivers and the vehicles in agreement with the laws in force, the guarantee of interworking between the systems and the availability of the decision makers of reliable indicators to act in the field of the road safety.

Rachid Smidi, Use of new technologies to supervise the traffic on bridge MOULAY AL HASSAN of Bouregreg, (AAVB, Maroc)

Rachid Smidi explained in his presentation the operation of a system of video and numerical analysis of image set up during the installation of the new bridge Moulay Al Hassan within the framework of the development of the valley of Bouregreg. It aims to measure the traffic on
the level of four strategic crossroads, like on the bridge connecting the towns of Rabat and Salé.

Data analysis makes possible to define the optimal strategy to offer an acceptable level of service during the life of the building site. Measurements are based on a whole set of variables obtained by video analysis and three principal sizes, incorporated temporally: Flow gives information on the total number of vehicles having been detected on a given zone and lasting one period of aggregation given the volume of obstruction (indicating of performance of the crossroads). It gives information on the congestion according to the direct measurement by average videos of the queues on a given zone and for a given period, that is to say the equivalent of an average latency in file: surface representative of the volume of obstruction. Concept of surface east to be interpreted within the meaning of the integral: it translates a volume of file over the period considered. The saturation of fires gives information as for the saturation of the lines of fire by real a time measurement length of queue obtained by average videos. Scenarios to publish reports/ratios on the analysis circulation, to suggest it solutions of clearing and to feed from the tools of simulation and analysis of circulation.

2.6 Deliverable 3.4 - Session 3 - Infrastructure design and transport systems safety in the ESTEEM partners countries

Farès Boubakour, Road safety in Algeria (Batna, Algeria)

Farès Boubakour presents the situation as regards to the road safety in Algeria while stressing the shutter infrastructures (role, insufficiencies, some cases of figures). He also presents the projects of the government recently realized or in the process of realization and which have an impact on safety: Railway roads and motorways, ways of treatment of black spots, urban furniture, and the new metal houses (corner-pieces for the maintenance of the roads). Boubakour focuses on the role of infrastructure in road safety in Algeria, and the role of structuring infrastructure projects to improve the road transport system and its safety.

Sebastian De la Rica, Road safety and Infrastructures, (Spanish Traffic Engineers, Spain)

It is frequently said that the infrastructure is responsible for one third of deaths caused by traffic accidents but the real truth is that infrastructure is only one of the three legs that, together with the driver and the vehicle, form the tripod over which road safety is based. It is not possible to analyze the behavior of one leg without considering the others. Road safety linked to infrastructure is so important that must be analyzed and taken into account as separately as possible from economic and environmental aspects. It is imperative to integrate safety in all phases of planning, design and operation of road infrastructure. Road safety impact assessment, road safety audits, ranking of sections with high risk of accidents, and road safety inspections are four essential tasks for the improvement and maintenance of road safety.

Completing the above-mentioned it is an analysis of the real meaning of the expressions "self explaining road" and "forgiving road side".

Francesco Filippi, Infrastructures design and their safety in Italy (CTKL, Italy)

Several aspects related with safety of infrastructures are of topical interest in Italy. The awareness about the road safety verification (audits and inspections) increased in the last years and some projects about these aspects have been carried out. Significant steps forward have been done concerning the protection of the vulnerable users, through mobility
management measures (to reduce the use of private vehicles), for instance creating pedestrian areas or cycle paths. Some guidelines and tools have also been created concerning the vulnerable users safety. The rail crossings protection is in the vanguard, with plans for the total elimination of the rail crossings.

To date the design of new infrastructure is sufficiently developed and the guidelines guarantee a sufficient safety level. Anyway, the verification of minimum safety conditions is not carried out to date. On the same way, the safety verification of existing infrastructure is not an habit and is rarely accomplished. A clear regulation about this is missing. Similarly, the maintenance of infrastructures is done case by case according to the necessity and quite never basing on well defined maintenance plans. The main cause is the low financing in this field. The protection of vulnerable road users has to be further improved. More attention has to be put to some user categories, like elderly, disabled, pedestrians. Plans aiming at increasing the vulnerable users safety do not exist.

Main opportunities relate with the extension of the existing guidelines and tools (e.g. for vulnerable users) at national level. The knowledge gained concerning the infrastructure safety can be a good basis for developing plans for increasing the safety (e.g. through maintenance and verification of safety).

Main threats are represented by the financing aspects. The investments in the field of road safety verification and maintenance have to be increased and supported by central administration. The financing is also crucial to improve the rail crossing safety, as the measures to be undertaken for their elimination at national level are expensive.

2.7 Deliverable 3.4 - Session 4 - Infrastructure and transport systems safety in Morocco

M. Benjelloun, Exploitation and safety of road infrastructures in Morocco (DR/MET, Morocco)

Mr. Benjelloun discusses the exploitation and safety of road infrastructures in Morocco, which includes the actions of management of the road traffic and information of the users intended to allow, to improve or to facilitate the use of a road network in all the situations. That covers particularly:

- collect, processing and spreading of statistical data on road traffic and corresponding people injuries;
- road signs and road equipment;
- adjustments of safety along the road network;
- management of exceptional transport and the sporting events organized along the roads;
- instruction of the files of temporary request for occupation of the road public domain;
- winter viability.

The approach that was adopted consists of determining the main stakes of the road insecurity on a representative sample of the road network (about 2,000 kilometers) by approaching the role of the infrastructure in the cause of accidents by analyses of conflicts based on observations of interactive behaviors User-Vehicle-Infrastructure.

That allowed the identification of the principal accident genes factors:

- the vulnerable users (pedestrians and 2 wheels) represent a significant part of killed (53,15% in 2008);
- the front collisions and the losses of control are dominating for the light vehicles;
• difficult cohabitation between the rural users who use traditional means of transport (2 wheels, animal haulage…) and other users largely using more recent, powerful and comfortable vehicles;

• users who pass without sufficient visibility;

• excessive speeds;

• movement of the pedestrians and cyclists along the expressways

The principles of design and exploitation of the lenient road infrastructures retained in Morocco and the total recommendations related are:

• Taking into account the local practices; (the sources of conflicts which can result from the superposition of the various functions must be sufficiently known, included/understood and controlled in order to limit their possible consequences).

• Taking into account the crossed medium (to make particularly readable the distinction between the close-cropped countryside and the agglomeration which requires a behavior associating a moderate speed and a raised level of attention, and to offer facilities to the light vehicles to carry out the passing in mountainous zones).

• Taking into account the behavior of drivers (to ensure the sedentary conditions of interaction Environment/Users by taking in account the possible human failures; in crossroads where control is particularly complex: to allow an easy and fast comprehension of the operating mode of the crossroads).

• Taking into account the evolution of the road network (the parallel roads with the motorways must offer a substantial profit of safety to the detriment of a extension of the time of course, by redefining the transversal profile and by refitting the intersections)

• Taking into account road signs and equipment (the road signs and equipment which, by nature, are designed in an objective of improvement of safety conditions, must be the subject of the greatest attention during the project study phases as well as in the phases of implementation and maintenance).

**Moha Khaddour, Management safety and security at ONCF (ONCF, Maroc)**

Moha Khaddour presented the ONCF structure and commercial creations: 30 millions of travelers, 10 million tons of goods, 30 million tons of phosphates, the important technical creations for 2002-2009 and the strategic development plan for 2010-2030. He described eleven steps Safety Management System based on the three Factors Human–Technical–Organization. Then he presented APR method based on risk analysis and risk management. Then he reviewed the Security Management System which requires:

• a reference framework for monitoring security and general principles relating to the organization and the animation of the security process;

• a security manual, indexing all the procedures as regards to security and its organization;

• an Annual Action Plan, a Security Plan, Internal Contracts;

• forms;

• recordings.

Finally, Methods of the Control of Proximity are explained as well as the Implementation and execution of Control.
Benaceur Boulajoul, Stakes of road safety in urban environment: case of Morocco (CNPAC, Maroc)

Benaceur Boulajoul explained that the road transport is very complex and dangerous. According to reports of the WHO and the World Bank, nearly 1.2 million people die each year in traffic accidents in the world, and the casualties could be 50 million, that is to say the combined population of five of the largest cities of planet. The tragedy that these figures mask less often holds the attention of the media than of other types of tragedies, less frequent but more unusual. Projections at mid and long terms show that without constant efforts and new initiatives, the total number of the world deaths and the ascribable traumatisms to the road traffic should increase some 65% between 2000 and 2020 and of 80% in the developing countries.

The majority of these deaths currently touch a vulnerable population made up pedestrians, cyclists and motorcyclists. And even if overall the deaths among the occupants of the cars continue to prevail, the risks per capita which are confronted with the vulnerable users are important. Today the traffic accidents occupy the ninth rank in the causes of the world burden of the diseases. Continuously on the same tendency, accidents would be found with the third rank from here 2020.

In Morocco, the plague of traffic accidents also constitutes a major danger to the public health whose economic as well social consequences are disastrous. Beyond the human drama which plunges into mourning of the thousands of families each year, the plague of the traffic accidents has harmful consequences on the economy of the country, mortgaging growth and productivity. The socio-economic cost is immense and represents for Morocco a loss of about 2.5% of the GDP, that is to say more than 11 Billion Dirhams per annum. Annually, close to 3/4 of the personal injuries to the road traffic and 1/3 of killed occur in urban environment. This being, and beyond the figures, the problem of the road insecurity in urban environment in Morocco remains ignored for lack of expertise on the one hand, and because of multiplicity of local actors concerned with the problem on the other hand.

The studies carried out by the National Committee of Prevention of the Accidents of Circulation in the five last years come to fill an obvious vacuum in the field of the road safety in urban environment. Three studies were carried out and which cover a field of study extended enough, Casablanca, Rabat-Salé-Témara and Fes. These studies were carried out to be used as models to meditate for the other towns of the Kingdom. Today, two other similar studies are being carried out, in Oujda and Marrakech.

The guiding principle of these studies is that they make the use of the new techniques of the information systems to determine the problem of the road insecurity on the level of the finest detail. Results obtained are of extreme importance and will certainly serve to reduce the risk of accidents and to improve safety conditions of users.

Through obtained results, it possible to note that the accidentogene behavior in circulation within studied cities is dominating and causes are multiple. It is noticed that there are few accidents compared to the multitude of dysfunctions observed.

Moreover, the road traffic is characterized by local habits from behavior acquired with the wire from time with the evolution from complexity of circulation.

As for infrastructure, the dysfunctions are multiple: broad road influences (boulevards and crossroads); bad assignment of spaces; bad taking into account of the vulnerable users: pedestrians and two wheels; failures of indication: tricolour, horizontal and vertical; lack of credibility of vertical indication related to speed; failing indication of the roundabouts; badly organized parking, etc.

The recommendations of these studies are multiple. They are referred, in particular with the framing of the behavior control, the adjustment of the infrastructure, the indication and the management of the traffic.
**A. Perez, Road safety, the vision of Alsa, an operator from both sides of Mediterranean sea (Alsa, Maroc)**

The presentation shows a view of the main general lines of safety system of ALSA and how it is focused over the three basics elements of operating safety: the vehicle (a suitable element for a greater objective control on behalf of the operator), the driver (an element with an important subjective component but on which the operator still can works) and the infrastructure/environment (which escapes from control of the operator who only can act through former elements) where the transport services pass.

Also it shows the actions ALSA puts in place over these three elements with the objective to guarantee operating safety.

It shows a view of the ALSA experience in Morocco where it can appreciate the differences between both sides of Mediterranean Sea regarding to passengers transport. At the end it adds some dates about accident statistics in Spain and Morocco.

### 2.8 Debates

The presentations by all speakers have been considered of high quality, and they lead to many questions, suggestions, debates and recommendations that are reported in the results section. In the following, we summarize the main questions and answers.

**Question:** Mr. Hamid, Ministère de la santé. The cost of ITS devices is very high and may not be accessible to Maghreb countries.

**Answer:** Mr. Laurgeau, INRIA. The cost of these systems decreases with vulgarizing. There is still a few years the cost of cameras, radars, lasers was still expensive, but today there are web-cams of high precision in all the PCs. As for the GPS chip, the prices fall down and all these technologies will spread in the near future.

**Question:** Mr. Hachemi, ISTLS. Will the piloting and monitoring system be limited to the bridge Moulay Hassan or all over the city?

**Answer:** Mr. Smidi, AAVB. The development of the system will be done in four phases. Phase 1: crossing of the river (transitional stage); Phase 2: startup of the tram, same security conditions on 65 crossroads on the line of the tram; Phase 3: development on all the zone of impact of the tram; Phase 4: development all over the city (strategic crossroads).

**Question:** Mr. Kerabi, Engineer, EMI. Do the embarked systems take account of the exceptional cases of operation, and in the event of an incident what is the logistic of evacuation?

**Answer:** Mr. Laurgeau, INRIA. The regulation of transport imposes that the driver has the responsibility for the vehicle and automation is not authorized. For example ESP acts and takes the decision in the last milliseconds before the incident, when the driver can do nothing any more. As another example, with the cruise-control, you drive at constant speed, and if there is an obstacle or that the vehicle in front of you decelerates and that you do nothing, there will be impact. With the ACC, Adaptive-Cruise-Control, if it detects that you approach too much the vehicle in front of you, it deactivates itself. The ACC is the way for intelligent speed regulators. Concerning the logistics of evacuation, the priority ways communicate by codes with the emergency vehicles so that traffic lights open the way to them.
Question: Mr. Hamed, MET. Which are the modes of facilitation of the chain of transport, and multimodal transport?

Answer: Mr. Smidi, AAVB. On the level of the intermodality, there will be in Rabat a single operator with obligation of folding back the users towards the tram but we are still negotiating with the operator. Concerning tickets, we will make sure of the interworking of the tram-cards that will have the same standards of bank cards. We will construct car parks relay at strategic points in order to allow the change of mode. But there is 200 million euros to deaden by the ticket of tram, over a period of 30 years. For the exploitation of the tram, the Wilaya wants to keep the property of the tram and to concede of it only the industrial risk over 4 years or 6 years.

Question: Mr. Khaddour, ONCF. What is security level today and at the time of the startup of the tram, and did you do a simulation on the improvement of this security level after the startup of the tram?

Answer: Mr. Smidi, AAVB. We did simulations through sensors of traffic and the Emme/3 software. Today there is not one rush hour, but the peak is all over the time. Space is badly managed and the traffic light cycles are badly adapted. We will make micro adaptive regulation and dynamic allocation of the lanes. As for the improvement of safety, I do not know. There are problems of behavior…

Question: Mrs. Idrissi, CNPAC. 1/ Does ESTEEM hope to have partnerships with the local level authorities. 2/ Concerning the pedestrians, counting were made before or during the project; the conflict may remain unsolved.

Answer: Mr. Tripodi, CTL. 1/ In the ESTEEM project, the actions of networking aim to approach other consortia and to establish agreements with other networks. The local manager, as within the framework of this workshop in Morocco, tends to create links between ESTEEM network and local stakeholders. The same actions are undertaken in the other countries.

Mr. Smidi, AAVB. 2/ Counting are taken on the bridge Moulay Hassan (before arriving in this zone). Then is it necessary to make pleasure to the 14% pedestrians or to support the Urban Transport.

Question: Mr. Filippi, CTL. As the tram is in the middle of the streets, what are the safety measures for pedestrians (problems of crossing the street) and for the passengers (problems of mount-descent in the middle of the street)?

Answer: Mr. Smidi, AAVB. Systra and Egis work on the subject. We will have stations tram-tram and stations bus-tram. Within the crossroads there is light signalization for the pedestrians. We have also installations for reduced mobility users.

Question: Mr. Hamid, Ministère de la Santé What are the in-vehicle devices of detection of tiredness, drug, alcohol, etc?

Answer: Mr. Laurgeau, INRIA. Does the breathalyzer test make it possible to detect if a person drunk too much alcohol? Have you foreseen also any systems for children and people with reduced mobility?

Question: Mrs. Benchekroune, EMI. You said that there are problems of changing behaviours. Which are behaviors to be changed?

Answer: Mr. Smidi, AAVB. It is not a problem of the tram. We make infrastructure. Other organizations must educate people.
Question: Mr. Mabrouk, ISTLS. I understand that the impact study on safety was not made for the tram.

Answer: Mr. Smidi, AAVB. We made traffic simulations. With our consulting engineers, the authorities gave the priority to the tram. We did a benchmark with certain streets of Paris. But we did not make an audit of safety.

2.9 Synthesis of the main results
As reporting of the workshop, Omar Drissi-Kaitouni (partner of ESTEEM and project manager for EMI) made at the end of the event a synthesis of the main aspects treated and of the main results.

2.9.1 Road safety situation in Maghreb
Statistics show that the number of killed in Maghreb countries is about 10 times more than in European ESTEEM countries and 15 times more than in Switzerland, as shown in Table 2.1.

Table 2.1 – Comparison of road safety statistics between Tunisia and other Countries

<table>
<thead>
<tr>
<th>Indicator Country</th>
<th>Number of killed / million inhabitants</th>
<th>Tunisia vs other countries</th>
<th>Number of killed / million vehicles</th>
<th>Tunisia vs Other countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tunisia</td>
<td>153</td>
<td>1.00</td>
<td>1302</td>
<td>1.00</td>
</tr>
<tr>
<td>Algeria</td>
<td>113</td>
<td>1.35</td>
<td>1156</td>
<td>1.12</td>
</tr>
<tr>
<td>Morocco</td>
<td>123</td>
<td>1.24</td>
<td>1749</td>
<td>0.74</td>
</tr>
<tr>
<td>Italy</td>
<td>89</td>
<td>1.72</td>
<td>134</td>
<td>9.71</td>
</tr>
<tr>
<td>France</td>
<td>77</td>
<td>1.99</td>
<td>130</td>
<td>10.01</td>
</tr>
<tr>
<td>Spain</td>
<td>94</td>
<td>1.63</td>
<td>160</td>
<td>8.14</td>
</tr>
<tr>
<td>Switzerland</td>
<td>50</td>
<td>3.06</td>
<td>87</td>
<td>14.96</td>
</tr>
</tbody>
</table>

2.9.2 Objective of the European Commission
The objective of Europe was to reduce the number of killed by 50% over the period 2000-2007. This has been relatively, more or less, satisfied by the European ESTEEM countries, but all show a real progress toward that objective as it is shown in the Figure 2.1.

However the Maghreb countries are still far from this objective since they are still trying to stabilize this indicator that was in an increasing trend. During the period 2000-2007, we observed in Algeria a stable trend, -11% injuries and -5% killed in Tunisia, and, in Morocco, good signs in 2005, but globally yet trying to stabilize the positive trend of these indicators.
20

2.9.3 Accident causes

Reported causes of accidents are related to three factors: vehicles, infrastructures, and human factor.

Maghreb countries relate more than 90% of accidents to human factors (see Figure 2.2) while the infrastructure of these countries is far from European quality standards. According to Algeria this contradiction can be explained by a bad reporting of the accident causes by the police.
2.9.4 Recommended tools for safety

During the workshop, tools and experiences of European and Maghreb countries have been presented. These can be grouped into three fields:

- Conventional tools
- Intelligent Transport Systems
- Intelligent Infrastructure

Among the conventional tools used in most of the countries, it was recommended multiplying the use and implication of:

- associations;
- education, training, Communication and public awareness campaigns;
- press, TV, radio;
- conference, seminars;
- support for victims and their families.

Immediate actions should be started for treatment of the black spots:

- geometry of the layout;
- modification of infrastructure;
- various means to force user to reduce speed;
- improvement of the visibility;
- sufficiently broad pavement for pedestrians.

Actions for improving safety and security should be done in the framework of integrated and planned safety actions:

- Safety Strategic Plans;
- Observatory of Safety;
- Institutes of Higher Education;
- Coordination between all stakeholders;

A specific action to be extended is “enforcement”. It should be generalized to all over transport network at all time, and reduced human intervention penalizing contravening. ITS will help to achieve that objective by its automation. Other major necessary actions to make repression efficient are:

- allocate more funds for transports systems safety;
- revision of the penal system;
- improvement of the legislative texts and road code;
- strict police controls;
- mobiles and fixed radars;
- vehicles technical inspections;
- introduce points license.

2.9.5 Research and training

Among the directives of the European Commission (Directive 2008/96) it is stated:

- Research is vital to improving safety on the roads within the European Union.
Training and certification of safety personnel

Elsewhere across the world, all the important innovations as regards to transport where developed in the universities. For instance many software of urban transportation planning (e.g. Emme/2 and stan from University of Montreal) and other micro-simulation of traffic. Many ITS devices where developed in universities (e.g. all patented devices designed at INRIA), etc.

Therefore, and as a result of the workshop, Ecole Mohammadia d'Ingénieurs and CNPAC (the National Comity for Prevention of Accidents of Circulation) have signed a Convention of Collaboration which should help develop researches and trainings between the two parts.

2.10 Deliverable 3.3 – Main results of sub-area 3

During the workshop, promotion of Intelligent Transport Systems and their benefits in transport systems safety, planning, management and control has been demonstrated.

In particular, since human factor is behind up to 95% of the road safety problem. French speakers might say to remove man from the wheel and use automated vehicles. This is probably the solution that it will be adopted in the long term. However, there are more than technical considerations that must be solved before that this kind of tools will be generalized all over the world. We can list at least the following problems:

- hardware and software to be homologated;
- hardware must be safe for human health;
- hardware and software standards must be developed;
- confidentiality of private life;
- human factors in the exploitation of ITS;
- risk on human and its environment;

Furthermore, someone must justify the cost and benefit of these systems before someone could be convinced of their efficiency for a practical use.

In short term and for an immediate use, it is recommended to use extensively ITS for the modernization of information systems related to safety and security of transport systems. Some recommended applications are described here below:

- **Electronic Administration**
  - Electronic driving license;
  - Electronic vehicle license;
  - Management and control of user services;
  - Information systems modernization;
  - Coordination between stakeholders (Police, Gendarmerie, Samu, Hospitals, Ministries, users, …);
  - Databases management.

- **Electronic control**
  - Radar management;
  - Infringement management;
  - Points and penalty control;

- **In-vehicle Intelligent devices**
  - Assistance to the driver to avoid the collisions;
- Collision warning;
- In-vehicle radar, cameras, stereo-vision;
- GPS guidance.

A summary of the results obtained during the workshop for sub-area 3 is reported in the following Table 2.2 and Table 2.3, respectively for Maghreb and European countries.

### Table 2.2 – Sub-area 3: summary of results for Maghreb countries

<table>
<thead>
<tr>
<th>Items</th>
<th>Algeria</th>
<th>Tunisia</th>
<th>Morocco</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITS for road safety</td>
<td>Transport plans, traffic plans are mandatory for chief cities, transport planning tools are required to be developed for large cities. Plans do not take account of safety. Computerized tracking system must be implemented for report of fatalities. Problem of homogeneity of data and methods for recording accidents. Data collection information system is required.</td>
<td>Lack of planning with a disparity between the Tunisians. Lack of coordination between national and local plans. Defects of the system of checks and sanctions: laxity and tolerance of the forces of order. ITS for control are needed for more systematic application of fines. Quality of the data on accidents is not detailed enough.</td>
<td>No law imposes cities to develop a plan of urban transport. Lack of competence in urban planning tools. Lack of geo-located data in urban areas, needed for analysis of urban safety. Computerization policy accompanied by the introduction of electronic records will improve the situation. Computerization policy made for several years ensures now consistency of data and information. Geo-location data and qualitative data are poor in urban area.</td>
</tr>
<tr>
<td>ITS for safety and security of port operations</td>
<td>A good availability scientifically based</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2.3 – Sub-area 3: summary of results for European countries

<table>
<thead>
<tr>
<th>Item</th>
<th>Spain</th>
<th>France</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITS for road safety</td>
<td>ITS applications are mainly related to enforcement, speed radar control, but also informative systems are available with positive effects. Systems related to vehicle safety are slowly introduced in new cars and cooperative traffic (V2V) is just starting, as well as V2I</td>
<td>The automated control system based on the deployment of speed camera has been well combined with the repression.</td>
<td>The automatic enforcement systems for highways provided very effective results. On-board applications exist.</td>
</tr>
</tbody>
</table>
### 2.11 Deliverable 3.4 – Main results of sub-area 4

Concerning infrastructures, several inputs have been done during the workshop. In synthesis, for road:

- **Intelligent infrastructures**
  - Enforcement (speed radars, red light cameras, “tutor” system [in Italy, reduction of 50% of the number of accident where installed], BAC control system).
  - Travelers information (Variable Message Signs, pre-trip information, security devices ["pink boxes" - satellite devices to send alarms].
  - Incident management.
  - Communication with vehicles.

- **Standards**
  - Maghreb countries should develop standards that must be used at the study level of infrastructure (in the project of the tram of Rabat, no safety audit and no safety impact study were made).

- **Rail**
  - Incident management.
  - Emergency management.
  - Real time security assessment.

- **Maritime**
  - Incident management.
  - Emergency management.
  - Real time security assessment.
  - Port security devices.

- **Structuring projects**
  - Underground in Algeria.
  - Tramway in Morocco.
  - Rehabilitation and extension of the rail.
  - TGV in Morocco.
  - National road and highway network extension.
  - Hoppers.
  - Intelligent vertical and horizontal signs.
  - Rest areas and help centres.
A summary of the results obtained during the workshop for sub-area 3 is reported in the following Table 2.4 and Table 2.5, respectively for Maghreb and European countries.

### Table 2.4 – Sub-area 4: summary of results for Maghreb countries

<table>
<thead>
<tr>
<th>Items</th>
<th>Algeria</th>
<th>Tunisia</th>
<th>Morocco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail crossing safety</td>
<td>The institutions charged of maintenance must be specialized. Investments are being given under nepotism.</td>
<td>It is necessary to develop awareness campaigns for road users to preserve the crossings tools.</td>
<td>The current laws and guidelines can be improved to take account of new technologies and new mentalities of the users.</td>
</tr>
<tr>
<td>Vulnerable users</td>
<td>Vulnerable users are not protected. A new policy must be developed for this group, including information and communication.</td>
<td>Vulnerable users are not protected. Pedestrian, cyclists and motorcyclists are also inadequately protected.</td>
<td>Vulnerable users are not protected and are rarely taken into account in the design and management of transport systems. Some actions are taken for this group, like distribution of free helmet and education campaigns.</td>
</tr>
<tr>
<td>safety audits and inspections</td>
<td>Absence of national strategy that takes care of infrastructure.</td>
<td>Necessity to increase the number of controls by qualified personnel and increase financing.</td>
<td>The most important problems concerning the safety audit are the follow-up of controls and qualification of personnel in charge of it.</td>
</tr>
</tbody>
</table>

### Table 2.5 – Sub-area 4: summary of results for European countries

<table>
<thead>
<tr>
<th>Item</th>
<th>Spain</th>
<th>France</th>
<th>Italy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail crossing safety</td>
<td>In urban areas situation is very bad with high flow of vulnerable users crossing in some parts.</td>
<td>There are some 16,000 crossing in France. It is necessary to install traffic lights, and avoid infrastructure projects (e.g. tunnels) because they are expensive. Radars could be established.</td>
<td>Lack of laws and guidelines concerning the rail crossings safety, but several high cost interventions and ITS applications exist in Italy especially for security aspects in rail transport. The situation of rail crossings is excellent, with plans for their total elimination.</td>
</tr>
<tr>
<td>Vulnerable users</td>
<td>A regulation improvement has been included in the law as well as in the practice at urban level and interurban. Good examples are the protection elements for motor bikers, at cities level self protection measures as well as ITS and infrastructural ones.</td>
<td>The actions concern both the occupants of vehicles with engines and vulnerable users.</td>
<td>For vulnerable road users insufficient efforts are done: vulnerable users are still few protected. There are still problems with road crossings, bicycle lanes, and absence of laws in favor of vulnerable.</td>
</tr>
<tr>
<td>safety audits and inspections</td>
<td>Audits are starting in Spain, inspection are widely applied. No trained people are available for inspection work. There is a lack of resources and tools.</td>
<td>It should be established joint committees at the departmental level so that management involves local stakeholders.</td>
<td>Safety verification is done occasionally and is not based on detailed analysis.</td>
</tr>
</tbody>
</table>
### 3 Dissemination aspects

In terms of media coverage, all measures have been taken to make an as large coverage as possible of the event. Many contacts and exchanges have been taken with the media before the event. These efforts were successful because all partners were present and especially the two main Moroccan National Televisions SNRT (First channel) and 2M (Second channel). The scientific event has been largely covered by both televisions in the 20h journal where most of ESTEEM partners have been interviewed: Antonino Tripodi (Italy), Claude Laurgeau (France), Farès Boubakour (Algeria), Hachemi Mabrouk (Tunisia), and for Morocco M. Chraibi (CNPAC) and M. Drissi-Kaïtouni (EMI).

A synthesis of the workshop event was sent to the MAP (Maroc Agence Presse) which spread it over newspapers of Morocco.

**2M**  🌟 Claude Laurgeau, France, has been interviewed by SNRT-TV (TV 20:30 news), SNRT-Radio (12:30 news) and 2M (TV 20:30 news). He explained that the new technologies and particularly ITS can enhance road safety in Morocco; he based his arguments on examples of such tools in other countries.

**2M**  🌟 Interview by 2M (TV 20:30 news) with Antonino Tripodi, Italy. The interview focused on the objectives of the project and on the situation of transport safety in Morocco. Tripodi explained the project objectives and the activities carried out since the beginning of the project. He underlined as the project is finishing fruitfully both for European and Maghreb research. He also explained the differences between transport safety in Europe and in Morocco and some possible inputs to make situations and contexts more similar. The benefits and importance of the second workshop of ESTEEM, held in Rabat, were explained.

**2M**  🌟 Interview by 2M (TV 20:30 news) with Farès Boubakour, Algeria. In this interview, Farès Boubakour was asked to talk (in Arabic) about the Intelligent Transport Systems and their importance within road safety. He answered that the ITS constitute an important research orientation in the ESTEEM project and that project partners have carried deeply thought on the question and highlighted the contributions of the ITS to the field. He said that the ITS are particularly important since they have given interesting results in the European countries, mainly the systems used in traffic management, those used for users information, and the information systems behind radars which reinforce in a significant way repression.

🌟 Omar Drissi-Kaïtouni, Morocco, has been interviewed by SNRT-Radio (12:30 news - Arabic). He was asked on workshop objectives and the application of its results in Morocco.
He explained the purpose of the project and its contribution to the coordination of the activities of research and the policies between the partner countries. He explained also that many of the tools used in Europe in the field of safety and security of transport systems can be used to Morocco and Maghreb countries, such as information systems behind the electronic management of road safety, training, and control.

**ALBAYANE 21/10/2009 – N° 10628 page 4 (French)**
Azedine Chraibi, Secrétaire Permanant du CNPAC explained that the introduction of NTI in transportation systems is a strategic choice.

Benaceur Boulaajoul, Head of the Studies Department at CNPAC explained that the way that our streets are designed and build makes speed take over safety on Moroccan cities streets.

**Le Soir 21/10/2009 – N° 427 (French)**
Azedine Chraibi, Secrétaire Permanant du CNPAC explained the importance of infrastructures and incidence localization to help prepare key indicators for local authorities. He said that preparing maps for each city cost about 1 to 1.5 million Dirhams, and decision makers must be more involved in that process.

**Transport News & Logistics – N° 38 page 28 (French)**
The paper presented the objectives of ESTEEM project and the results the workshop should produce.

Copies of these articles are given in Annex V.

### 4 Networking

The workshop has been a very important moment for the networking activities planned in ESTEEM. The workshop was a further occasion to introduce the audience ESTEEM project and ESTEEM website and to invite participants to visit the website and to log in as well as to participate in forum section and discussions.

A second newsletter containing workshop details and contents was spread out and shared among all ESTEEM partners and all related partner contact list in order to reach and involve the largest number of stakeholders. Moreover, all workshop presentations, brochure and press release were collected and uploaded on ESTEEM website in order to share the content and information among all partners. Finally, all contacts of workshop participants were collected in order to insert them in the existing ESTEEM contact list. In this way, they will be joined to ESTEEM network and will be updated on next final workshop to be held in Sousse and on projects results and activities and they will add to mailing list in order to receive next newsletter and other relevant information and materials.

Concerning the preparation of communication about the workshop, a great spread and advertisement of the event occurred: it was included and advertised in several European and Algerian web sites, like the following.

- Ecole Mohammadia d’Ingénieurs website (Morocco): www.emi.ac.ma
- CNPAC (Morocco) website: www.cnpac.ma
- ESTEEM project website: www.esteemproject.eu
- Research Centre for Transport and Logistics - "Sapienza" University of Rome (Italy): www.ctl.uniroma1.it
5 Conclusion

These deliverables summarize the organisation and outcomes of the second workshop organised in the framework of the work package 3 of the project ESTEEM. The workshop was held in Rabat (Morocco) on October 20th, 2009.

The workshop was hosted by the Moroccan partner of ESTEEM (Ecole Mohammadia d’Ingénieurs) and was opened to the participation of local and regional stakeholders, which was invited to present their remarks about the topics treated. The CNPAC (Moroccan National Comity for Prevention of Accidents of Circulation) was interest to the work of ESTEEM and has manifested his interest in collaborating to the organization of the second workshop. Therefore, EMI has decided to organize the workshop in the locals of CNPAC.

The workshop focused on two of the four sub-areas defined in the work package 1 of the project, especially:

- Sub-area 3 - Information systems for transport safety
- Sub-area 4 - Safety aspects for infrastructure design

The workshop was opened to the participation of local and regional stakeholders, which was invited to present their remarks about the topics treated. Several decision makers and agencies at central and local levels in Morocco and researchers from several universities and institutions participated to the workshop.

The discussions in this workshop, related with sub-areas sub-area 3 and 4, provided useful and complementary indications to those of the first workshop held in Batna, which was concerned with sub-areas 1 and 2, for elaborating the roadmaps for the future researches on the topics of ESTEEM project.

The workshop of Rabat was an opportunity to refine the knowledge about the transport safety situation in the Maghreb countries. The complementary papers presented in the workshop sessions presented various tools used in safety and security management from both sides of the Mediterranean sea, but showed clearly some gaps in Maghreb countries where the number of dead/vehicle is about 10 times much higher than in Europe and that the human factor is the most important cause of accident (more than 90%).

The problem related to users behaviour, some kind of unconsciousness and even an ill will is quiet generalized. Education actions and public awareness campaigns and repression are token in Maghreb, but the number of accidents trend is not yet clearly decreasing in these countries. Therefore common tools of safety and security of transport in Europe should be immediately implemented in Maghreb countries, including legislation and road code.

5.1 Main conclusions for sub-area 3

The sessions relating with sub-area 3 of the workshop showed that the modernization of the information technology of transport systems in Maghreb will certainly help achieve the goals of a better management, control, education and training for an improved safety and security of transport systems. ITS systems presented during the workshop, may be helpful for that purpose, especially for electronic administration, electronic control, and driver assistance. In Maghreb countries, there is a lack of ITS hardware for signalisation, and traffic management and control of road transport. But these tools start being used in urban transport with the last structuring projects such as the tram of Rabat. TIC and ITS are however intensively used in rail, air, and maritime sectors were international standards imposes their use.
Innovation in the field of transport safety is developed in European countries which are naturally better equipped for ITS than the Maghreb. Very good results are achieved through the implementation of these techniques in European countries including the establishment of information systems and speed cameras.

The Maghreb countries are aware of the benefits of implementation intelligent transportation systems. Embedded systems depend mainly from the car manufacturers, but all others systems like those for information to users and traffic management are easily transferable. We can identify at least the following topics:

- integrated planned safety actions;
- treatment of the black spots;
- development of ITS that reduce the human intervention in penalizing contravening;
- transport systems for safety, planning, management and control;
- development of information systems and devices behind electronic administration and electronic control;
- in-vehicle Intelligent devices.

Concerning ITS for transport systems, main aspects retained are:

- Morocco: Several projects are developed related to the port traffic management, like the VTS. A further step would be by starting with pilot experiments through systems of sea management of traffic, systems of trucking and traceability of the goods, and the installation of monitoring systems.
- Morocco: Use of the GPS navigation systems equipments for the public transport in urban and interurban areas.
- Morocco: Development of GIS and digitalized transport networks is necessary to better identify black spots in urban area.
- Algeria: Development of a reliable system for collecting and processing data.
- Italy: A unique and homogeneous informative standard should be defined and used.
- Tunisia: To develop plans and guidelines for the ITS implementation.
- France: Development in-vehicle intelligent devices and V2V and V2I communication, analysis of the risks related to ITS, standard and homologation of ITS devices.

5.2 Main conclusions for sub-area 4

The sessions relating with sub-area 4 showed that infrastructure management can be improved by the use of new technologies, intelligent infrastructures for enforcement, travel information, emergency management, and real time security assessment. Finally, infrastructure design safety standards seem to be missing, or unused, in some Maghreb countries. Especially, the workshop showed that specific safety audits and safety impact studies were not done for the tram in Rabat. Therefore, this aspect, of taking account of safety in the studies phases of projects through standards, is a major recommendation among infrastructure actions for these countries.

In Europe the infrastructure is far better than in Maghreb. European countries have developed standards, maintenance techniques, audit and inspection methods, tools for better protecting vulnerable users, technologies and intelligent systems for road infrastructure, for rail crossings and for port operations. Most of this knowledge is transferable to Maghreb countries:

- Road infrastructure : Intelligent infrastructures for Enforcement, Travelers information, Incident management, and Communicating with vehicles.
• Rail infrastructure: incident management, emergency management and real time security assessment.
• Maritime incident management, emergency management, real time security assessment and port security devices.

Concerning the rail crossing safety, the main aspects to be considered are:
• Morocco: Improve the signalization in non guarded rails crossing and continue the policy of rails crossing elimination (tunnel, bridge or close the crossing).
• Italy: Improve the implementation of technological devices in rural areas and elimination of the rail crossings near cities.
• Tunisia: The rail crossings safety should be increased by using new technologies in this field.

Concerning the maintenance management, the main aspects to be considered are:
• Spain: Improve information tools to manage the control actions with success.
• Italy: The interventions are done case by case, basing on political decisions or for solving problems arising to the infrastructure. The costs of the maintenance should be verified periodically and the financing increased.
• Tunisia: The preventive maintenance is done rarely and it’s not adequate. Possible improvements could be obtained through a better training of the personnel dedicated to maintenance.

Concerning the vulnerable users in front of infrastructure design, the main aspects to be considered are:
• Spain: It is necessary to project and edit multidisciplinary and coordinated plans to get vulnerable users are more protected.
• Morocco: Improve laws concerning security and safety of vulnerable users and take account of vulnerable users in the planning process.
• Italy: It should be necessary to include the vulnerable users aspects in the design of infrastructures and use infrastructural devices for their protection.
• Tunisia: Increase the risk awareness of the pedestrians by education.

Concerning the design, the main aspects to be considered are:
• Spain: New design criteria guidelines from the Road Authority.
• Morocco: Develop the use of methods of safety audits and the raising of competences.
• Tunisia: Improve training of personnel in charge of the controls and by defining strategies for a periodic control.

Concerning the laws and guidelines, the main aspects to be considered are:
• Algeria: Encourage a modal shift towards public transport.
• France: Maintain effort on education to orient and guide the society.
• Italy: Define a clear legislation about the safety verification with obligation to realize periodically the verifications.
Annex I - Workshop program

08:30–09:00  Enregistrement

09:00–09:45  Ouverture officielle

Mot de Mr le Ministre de l'Equipement et des Transports

Mot de Mr le Directeur de l'EMI

Présentation du projet Esteem (A. Tripodi, Italie)

09:45–10:00  Pause café

10:00–11:20  Etat de développement des TIC en Europe

M. Thorson, Traffic Safety in Spain, Objectives and results, (PAT, Espagne),

C. Laforgeau, What are ITS, (Mines Paris, France),

Habib Hadj-Mabrouk, Analyse des risques des systèmes de transport intelligents, (INRETS, France),

A. Tripodi, State of development of ITS in Italy, (La Sapienza, Italie)

11:20–12:20  Etat de développement des TIC au Maghreb

H. Mabrouk, Road safety in Tunisia, (Istls Sousse, Tunisie),

M. A. Chahli, Contribution of the NTI to the road safety in the MET, (Dsi/MET, Maroc),

M. R. Smidi, Use of new technologies to supervise the traffic on bridge MOULAY AL HASSAN of Bouregreg, (Aavb, Maroc)

12:20–13:00  Débat sur le Développement des TIC visant l'amélioration de la sécurité et la sûreté des systèmes de transport

13:00–14:30  Déjeuner

14:30–15:50  Conception des infrastructures et la sécurité des systèmes de transport – Partenaires Esteem

F. Boubakour, Road safety in Algeria, (Batna, Algérie),

S. De la Rica, Road safety and Infrastructures, (Spanish Traffic Engineers, Espagne),

F. Filippi, Infrastructures Design and their safety in Italy, (La Sapienza, Italie)

15:50–16:15  Pause café

16:15–17:35  Infrastructures et la sécurité des systèmes de transport au Maroc

M. M. Benjeiloune, Exploitation and safety of road infrastructures in Morocco, (Dr/MET, Maroc)

M. M. Khaddour, Management safety and security at ONCF, (ONCF, Maroc)

M. B. Boulajoul, Stakes of road safety in urban environment: case of Morocco, (Cnpac, Maroc)

M. A. Perez, Road safety, the vision of Alsa, operator in both sides of Mediterranean sea, (Alsa, Maroc)

17:35–18:00  Débat sur le rôle de la conception des infrastructures dans l'amélioration de la sécurité et la sûreté des systèmes de transport

18:00–18:15  O. Drissi-Kaitouni, EMI,

Synthèse et recommandations.
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Annex III - Speech of Mister the Minister of Equipments and Transport

Prononcé par Monsieur Chraïbi, le Secrétaire Permanent du CNPAC:

Monsieur Le représentant du Directeur de l'Ecole Mohammadia des Ingénieurs ;
Mesdames et Messieurs les Experts Européens et Maghrébins,
Mesdames et Messieurs les professeurs
Mesdames et Messieurs les représentants des organes média
Honorable assistance.

Permettez moi tout d'abord de vous transmettre les hommages de Mr Karim GHELLAB, Ministre de l'Equipement et des Transports qui a souhaité être parmi nous pour lancer personnellement l'ouverture de ce workshop scientifique. Cependant, un déplacement à l'étranger dans le cadre d'une mission officielle l'a empêché d'être parmi nous. Mr le Ministre m'a chargé de vous transmettre son message d'encouragement et son soutien infaillible pour cette noble initiative dont voici la teneur :

« Mesdames et messieurs

Je tiens à vous exprimer ma grande satisfaction quant au choix du thème de ce séminaire, et par la même occasion, saluer l'appui de nos partenaires du pourtour méditerranéen, européens et maghrébins représentant les institutions les plus prestigieuses dans le domaine de la recherche scientifique sur les systèmes de transport. Ainsi, ce workshop offre une plateforme d'échange des expériences de chacun de nos pays sur un secteur jugé comme le pivot des économies nationales mais aussi dont la sûreté et la sécurité constituent toujours un défi majeur pour les décideurs.

Mesdames et Messieurs,

Le rôle de la recherche scientifique dans le secteur des transports et de sa sécurité n'est plus à démontrer. Elle offre une assise et une légitimité scientifique aux actions entreprises par tous les acteurs dans ce domaine. La recherche, notamment la recherche appliquée permet également d'améliorer le rendement et la productivité tout en diminuant les risques qui leurs sont liés.

Conscient de ce rôle éminemment important, la réalisation des études dans le secteur des transports avec ses multiples dimensions était toujours une préoccupation du Ministère de l'Equipement et des Transports. Cette préoccupation se manifeste dans l'activité de ses différentes Directions opérationnelles, ses établissements de formation et les organismes sous-tutelle. Entre recherche académique et recherche appliquée dans les milieux professionnels, les acteurs concernés sont aussi nombreux que diversifiés dont on peut citer notamment, l'Ecole Hassania des Travaux Publics comme institution académique réputée dans la formation des ingénieurs de haut niveau et la recherche en matière de transport et d'infrastructure, l'Institut supérieur des études maritimes pour la formation dans les métiers de la mer, le Centre National des Etudes et de Recherches Routières (CNER) relevant de la Direction des Routes, la Direction de la marine marchande pour le volet
sécurité maritime et la Direction des Transports Routiers et de la Sécurité Routière pour les études concernant le transport de personnes et de marchandises.

Pour le CNPAC, la réalisation des études est non seulement une mission statutaire, puisque le législateur l’a chargé d’« Étudier et proposer aux autorités compétentes, toutes les mesures destinées à réduire le nombre des accidents de la circulation » mais c’est également choix stratégique. Ainsi, et conformément aux orientations de la stratégie nationale intégrée de sécurité routière et des plans stratégiques triennaux qui en découlent, le CNPAC a-t-il été chargé de développer des pôles de compétence dans le domaine de la sécurité routière, à travers le développement de différents types d’expertises, notamment :

• Une expertise thématique, pour améliorer la compréhension liée à des thèmes précis, tels que la ceinture de sécurité, le casque et la vitesse ;
• Une expertise comportementale et ciblée, qui s’intéresse essentiellement au comportement des usagers de la route de manière générale et au comportement de certaines cibles comme les enfants et les usagers vulnérables, etc.
• Une expertise technique, notamment en milieu urbain qui se focalise essentiellement sur les infrastructures, les aménagements de sécurité et la signalisation routière. Il s’agit notamment de l’élaboration de référentiels techniques pour assister les collectivités locales à mieux prendre en charge la sécurité routière au niveau local ;
• Une expertise sectorielle, dont l’objectif est de traiter des problématiques qui concernent un secteur ou un sous secteur précis tels que le transport public de voyageurs ou le transport public de marchandises.

Ainsi, l’implication et l’engagement du Comité dans ce workshop aux côtés de nos partenaires européens et maghrébins et aux côtés d’institutions prestigieuses de formation d’ingénieurs, est un indicateur parmi d’autres qui témoigne de son attachement à la recherche scientifique comme vecteur de changement et de promotion de la sécurité des systèmes de transport dans notre pays.

Compte tenu de l’importance de la recherche dans l’activité du Ministère, le Comité a pu cumuler à son actif depuis 2004, plus de 34 études dans différents domaines liés dont je cite notamment :

• 2 études relatives à l’identification des zones d’accumulation des accidents et victimes en milieu urbain dans les villes de Casablanca et Fès. Deux autres études similaires sont en cours de réalisation dans les villes d’Oujda et Marrakech ;
• Une étude relative à l’adaptation de la signalisation verticale relative à la vitesse en milieu urbain par rapport à l’environnement routier, cas des villes de Rabat-Salé et Témara
• Deux études spécifiques au milieu urbain dans le cadre de la coopération avec la JICA
• 4 études dans le cadre de la coopération avec l’Agence Suédoise pour le Développement International ;
• une étude se rapportant à l’identification de nouveaux panneaux de sensibilisation à installer dans les sections de route les plus accidentogènes ;
• Une étude axée sur le comportement, notamment sur les représentations, les attitudes et les pratiques des usagers de la route ;
• une étude sur les indicateurs liés au comportement des usagers de la route se rapportant aux thématiques suivantes : vitesses pratiquées, port de la ceinture de sécurité, port du casque par les cyclomotoristes, respect des panneaux Stop, respect des feux rouges et respect de la priorité à droite.

• Une étude de faisabilité pour la création d'une station radio dédiée à la sécurité routière.

Mesdames et Messieurs

Comme vous pouvez le constater, le développement du secteur de la recherche, notamment appliquée dans le domaine de la sécurité routière, n’est pas uniquement une ambition mais c’est une réalité. Notre objectif à terme est de mettre en place un observatoire national de sécurité routière doté des ressources humaines, techniques et financières nécessaires. Ce projet, une fois réalisé, sera d’un apport considérable pour consolider les énergies et les efforts de tous les acteurs pour se doter d’une batterie d’indicateurs permettant de mieux piloter la mise en œuvre de notre stratégie dans ce domaine.

Nous avons la conviction que le développement du secteur de la recherche ne peut être assuré sans l’ouverture réelle sur l’université à travers ses différentes institutions de recherches, comme les facultés et les écoles d’ingénieurs. Et c’est dans ce cadre les grandes écoles nationales concernées ont été conviées à prendre part à ce workshop pour identifier des axes d’intérêt commun et asseoir une collaboration fructueuse pour développer des pôles de compétence spécifiques. Je saisis cette occasion pour dire que le MET est ouvert à toutes les propositions des institutions académiques de formation et de recherches pour mettre en place une collaboration formalisée précisant les engagements des uns et des autres.

Par ailleurs, et en rapport avec l’un des thèmes de ce Workshop, l’intégration des nouvelles technologies comme outil de travail et de modernisation est un défi quotidien que nous relevons. Nous avons la conviction que les Nouvelles Technologies de l’Information et de la Communication (NTI) offrent de nouveaux espaces pour agir de manière rapide et efficace. Et c’est dans ce sens, que nous avons procédé dès l’année 2003 au lancement de projets innovants et structurants qui auront sans aucun doute un impact certain, tout d’abord sur notre façon de travailler en offrant un meilleur service public à l’usager, mais également sur l’amélioration des conditions de sécurité routière dans notre pays.

C’est dans ce sens que nous avons lancé des projets impactant comme l’automatisation de l’examen théorique pour l’obtention du permis de conduire, le permis de conduire et la carte grise électroniques, le contrôle automatisé de la vitesse et de la surcharge, la réforme des Centres de Visite Technique et leur mise en réseau, l’amélioration des bases de données liées au secteur. Ce sont là autant de projets appelés à façonner la vie du citoyen certes, mais aussi à améliorer sa sécurité.

Mesdames et Messieurs,

Avant de conclure, je voudrais souligner avec fierté l’engagement de nos grandes écoles d’ingénieurs et nos instituts de recherche dans cette cause nationale voire mondiale. Je rends un hommage particulier à l’école Mohammadia des Ingénieurs et à travers elles à tous les partenaires du consortium du Projet ESTEEM, pour cette initiative qui permettra, sans aucun doute, d’assurer un rayonnement de vos travaux à l’échelle nationale et internationale. Je sais que je nous pouvons également compter sur l’action de l’université.
marocaine à travers toutes ses composantes, facultés, instituts de formation et autres pour contribuer à assurer le bien être du citoyen dans ses déplacements.

Je souhaite plein succès à vos travaux et je vous remercie de votre attention.
Annex IV - Speech of the Director of Ecole Mohammadia d'Ingenieurs

Monsieur le Secrétaire Permanent du Comité National de Prévention des Accidents de la Circulation, je tiens à vous exprimer mes plus vifs remerciements pour les efforts que vous avez consentis pour la réalisation de ce workshop conjoint qui entre dans le cadre du projet Esteem.

Mesdames et Messieurs,


Le projet contribuera à la définition de plans futurs de la recherche pour le Programme Transport FP7 et pour les gouvernements des Pays Méditerranéens Partenaires.

Ce workshop permettra d’évaluer les développements possibles des TIC et plus particulièrement des ITS, Systèmes Intelligents de Transport, visant l’amélioration de la sécurité et la sûreté des systèmes de transport, et d’évaluer comment la conception des infrastructures peut être améliorée afin d’augmenter la sécurité et la sûreté des systèmes de transport par mode routier ou ferroviaire.

L’expérience des partenaires européens et maghrébins sera mise à profit pour animer et enrichir les débats.

C’est dans ce cadre que l’EMI et le CNPAC avec les partenaires européens et maghrébins du projet ESTEEM organisent ce workshop sur le Rôle des Nouvelles Technologies et des Infrastructures dans la Sûreté et la Sécurité des systèmes de Transport.


Bienvenue et bonne journée.
M. Azedine Chraibi, Secrétaire Permanant du CNPAC explained that the introduction of NTI in transportation systems is a strategic choice.
M. Benaceur Boulaajoul, Head of the Studies Department at CNPAC explained that the way that our streets are designed and build makes speed take over safety on Moroccan cities streets.
M. Azedine Chraibi, Secrétaire Permanent du CNPAC explained the importance of infrastructures and incidence localisation to help prepare key indicators for local authorities. He said that preparing maps for each city cost about 1 to 1.5 million dirhams, and decision makers must be more involved in that process.
Rôle des nouvelles Technologies dans les systèmes de transport


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