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ROADIDEA **Session**

ROADIDEA – Roadmap for radical innovations in European transport services

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Abstract

Weather plays a key role in most traffic accidents in Europe. Over 40.000 European citizens are killed and more than 1,2 million injured every year. Transport is responsible of 20% of green house gas emissions in Europe. These problems require new service innovations to improve traffic safety and to make traffic more efficient with reduced congestion.

ROADIDEA "Roadmap for radical innovations in European transport services" is a three-year European Commission co-funded Collaboration project initiated in 2007. See www.roadidea.eu for details and public reports. The main objective is to study the potential of the European transport service sector for innovations, analyzing available data sources, revealing existing problems and bottlenecks, and developing better methods and models to be utilized in service platforms. These will be capable of providing new, innovative services for various transport user groups.

ROADIDEA has fourteen partners from eight European countries. Differences of the existing transport systems and available data sources are analysed as well as the problems caused by local climate and geography. The innovation process is key activity of the project. It has produced more than 100 ideas during brainstorming seminars. Key results after the two innovation cycles are presented.

In 2010 ROADIDEA is extending outside Europe through an international cooperation project ROADIDEA-INCO with Federal Highway Administration and its Clarus initiative in the USA and Canada, where partners are ITS Canada and Environment Canada. ROADIDEA concept is mirrored to North-American transport systems. Innovation seminars will be conducted and results disseminated to local stakeholders. Final report will be available in July 2010.

1. Concept and project objectives

In the 14th SIRWEC 2008 in Prague, Project ROADIDEA (2007-2010) had just started and was briefly introduced (Saarikivi and Keskinen, 2008). During the 15th SIRWEC the project is almost completed. In this presentation the project concept will be described in more detail and results and recommendations discussed. ROADIDEA Partners will present several papers on key results of ROADIDEA in SIRWEC 2010.

ROAIDEA is a cooperative R&D project co-funded by the European Commission under the 7th Community Framework Programme for Research and Technological Development. Its objective is to study the potential of the European transport service sector for innovations, analysing available data sources, revealing existing problems and bottlenecks, and developing better methods and models to be utilized in service platforms. These will be capable of providing new, innovative transport services for various transport user groups. Project has fourteen partners from eight European countries, i.e. Finland, Sweden, the Netherlands, Germany, Italy, Slovenia, Croatia and Hungary. More information and public reports are available from http://www.roadidea.eu .

ROADIDEA work plan is organized in three main layers:

- Infrastructure layer, analysing and developing transport infrastructure, in particular sources and collection of data, development of methods such as data filtering and fusion, and weather and road condition models.
- Innovation layer, having two innovation cycles where new innovative transport service ideas are produced in a systematic way, first by organising Innovation Seminars followed by service development phase.
- Exploitation layer, including piloting and testing the new innovations in real service platforms, evaluating their business potential and user acceptance.

The working hypothesis of ROADIDEA is that effective accessibility to all kinds of useful background information combined with advanced data fusion methods are prerequisites for creation of innovative mobility services. Technological information platforms with high level of standardization are needed to create an information infrastructure, on top of which all kinds of systems and services can be built. This intelligent information infrastructure is a basic enabler for intelligent services in a similar fashion as any basic physical infrastructure such as roads, waterways, ports, communication networks, etc. The resulting transport service systems finally will serve as sources for added-value services for the whole transport chains, from pre-trip planning to execution. This general concept of exploiting transport information in a new, innovative way is also valid for developing better information processing tools such as weather or road condition models, traffic volume and congestion models and different alert services.

ROADIDEA analyzes the innovation potential of the European transport systems by developing a comprehensive methodology to collect very detailed and versatile traffic information, both static archived data and dynamic in real time from vehicles (onboard sensors) and infrastructure (e.g. roadside video monitoring, archives), and to process and

analyze this data for a large transport network in order to produce information on which a number of services can be provided.

To make the new data sources available for service providers there is a need to have access to the basic information and to develop methods to generate new information using all available data. The methods to be developed utilise a system platform making it possible to have access to wide data sources generated using exclusive methods. “Data” in the Figure 1 concept can be dynamic (on-line, up-to-date information, e.g. weather observations and forecasts, traffic and incident information) or static (e.g. various geospatial data registers such as climatic factors, road structures, accident statistics). Road weather forecasting models or road congestions models are examples of “methods”. “End users” are not limited to just road users, but is open to all transport users, whether private of professional: car, truck and bus drivers or passengers, pedestrians, bicycle and motorcycle drivers, marine or air travellers or those who are using multi-modal transport chains.

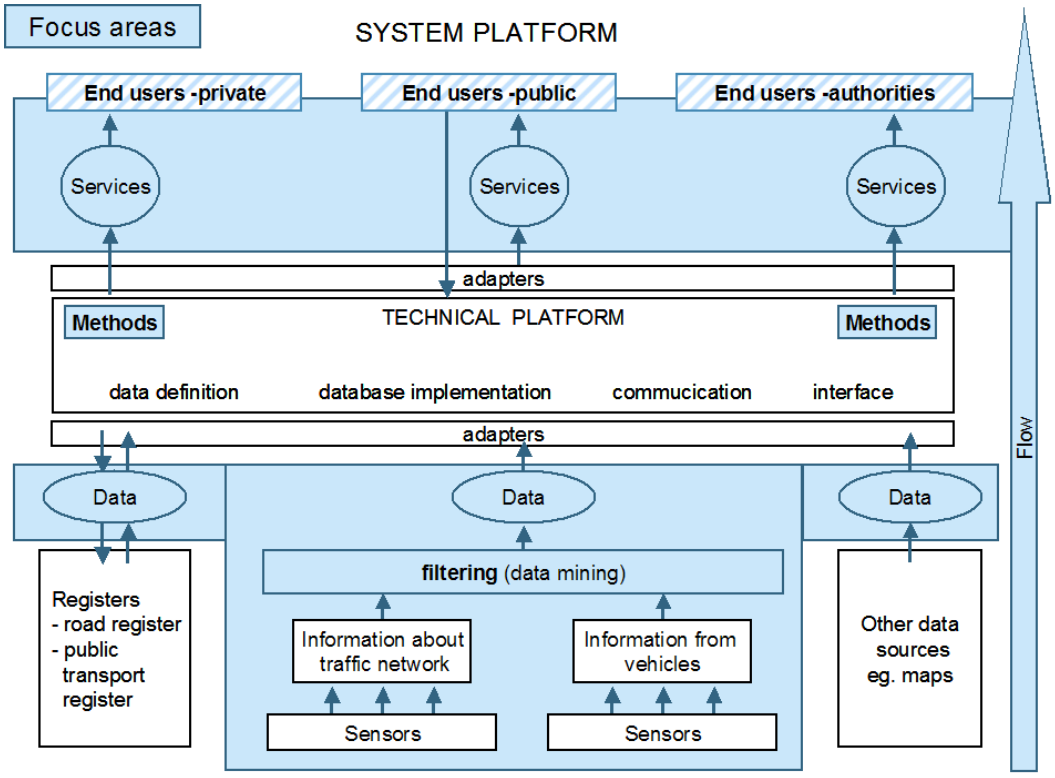

Figure 1. Main principles of ROADIDEA service system platform and the use of methods to be developed.

2. Progress beyond the state of the art

ROADIDEA investigates the content and necessary and optional elements to describe the data: what can these data tell us beyond its content alone and how do various data sources supplement each other. To achieve this, both the available data and conceivable data have to be found and analysed. Suitable formats have to be designed for further use. Once all data have been merged to a usable, preferably common data format, we can start to make

data comparable. Further standardization of present data formats is one of the key objectives of ROADIDEA.

By combining different sources of information it is possible to develop new applications, which are beneficial for drivers as well as maintenance operators. This is also a technology, which has a great potential when it comes to open new ways in safety applications. Knowledge of positions and road conditions can be used to increase the possibility to prevent accidents related to severe weather and road conditions. This is also a very important area to develop in order to provide high quality data to road users.

Effective innovation processes have been conducted in the beginning of the first and second year of the project in two-day Futures seminars. Best ideas were short-listed and taken into further development and consideration from ROADIDEA technical platform point of view. Keskinen (SIRWEC 2010) presents the innovation methods of ROADIDEA and best short-listed ideas. Figure 2 illustrates the scheme of two consecutive innovation and R&D cycles.

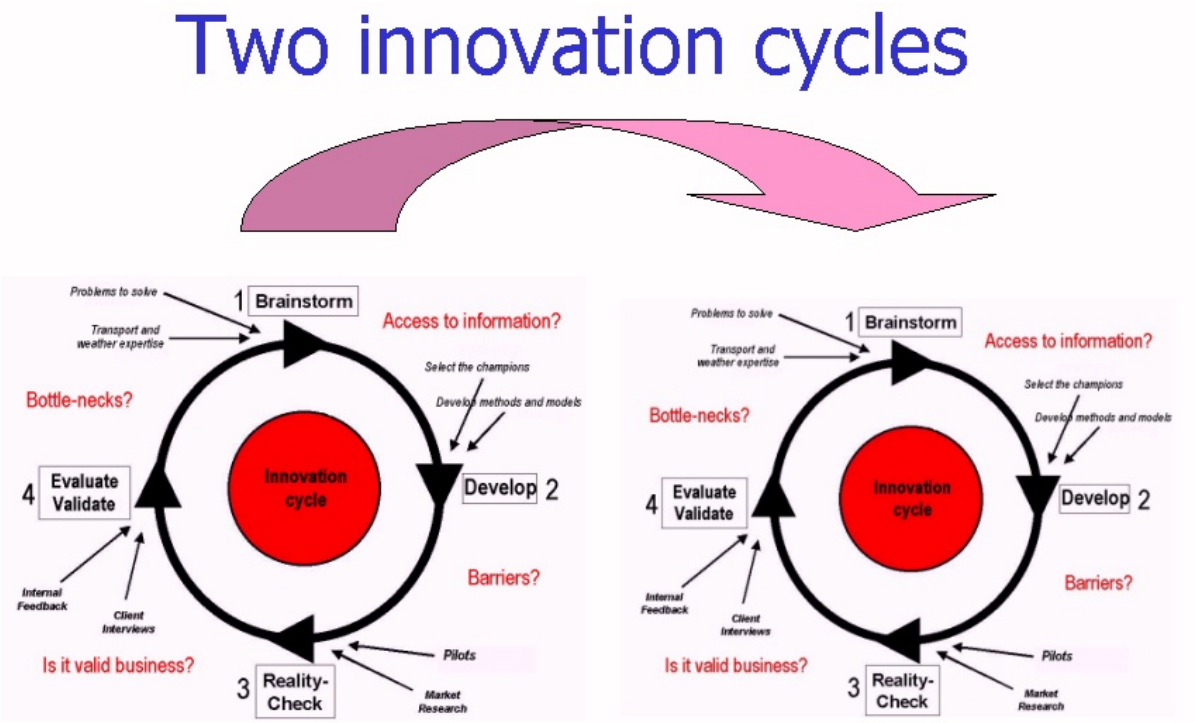

Figure 2. ROADIDEA project plan included two full innovation cycles from brainstorming through product development to evaluation and validation.

The Final Report “Road Map to Radical Innovations in European Transport Research” will be published in June 2010 and will wrap up the results and conclude the lesson learnt. The report will constitute a valuable report and reference for all transport service developers as well as policy and decision makers.

3. ROADIDEA-INCO cooperation with the USA and Canada

A question was raised in the first annual review of ROADIDEA: Project has concluded that the major barrier to new innovations in mobility services in Europe is in the restricted data policies. Do we know if the provision of mobility services is significantly larger in countries with more open data policy?

A proposal for extended international cooperation within ROADIDEA was put forward to find a solid answer to the above question. It is also a nice coincidence that a project started 2004 in the USA on development of the local road information system, i.e. the Clarus initiative (see www.clarusinitiative.org). It is a federal initiative managed by the Federal Highway Administration (FHWA) to develop and demonstrate an integrated surface weather observing, forecasting and data management system. The objective of Clarus is to provide information to all transportation managers and users to alleviate the effects of adverse weather (e.g., fatalities, injuries and delays).

Contacts to Clarus initiative were very positive and confirmed their interest to cooperate with ROADIDEA. Thus an international cooperation project became timely and necessary. Clarus initiative will be the primary international partner for ROADIDEA-INCO in the USA, and its Multi-state Regional Demonstration will extend the study to Canada as well. Canada is of special interest due to their harsh winter climate comparable for the Nordic countries in ROADIDEA, and quite advanced road condition forecasting methods developed by Environment Canada, which will be compared to the ones developed during ROADIDEA and elsewhere in Europe.

ROADIDEA – INCO project starts in the beginning of 2010 and takes altogether seven months, to be finished at the same time as its parent project ROADIDEA. First introductory meetings during TRB2010 in January with Clarus key persons in the USA will introduce ROADIDEA and detail the work plan. Visits to FHWA, ITS Canada and Environment Canada and other key organisations in road observations, services and modeling (such as Cornell University in Ithaka, New York and Traffic Information Centre in New York) are made. After a thorough fact finding missions, project team will convey a comparative study on the use and availability of data, existing methods and models, data policies, and mobility services in the USA and Canada, comparing the results to those achieved earlier in ROADIDEA for Europe.

Innovation seminars will be conducted with the US and Canadian partners, with Partners' experts, decision makers and their invited stakeholders. Close to the fulfillment of the project, public seminars will be organized to present the final results of ROADIDEA-INCO to their key experts and stake holders.

4. Key results and recommendations

In the beginning of 2010, project ROADIDEA is closing its second innovation cycle, having created more than 100 ideas in two brainstorming events. See the summary by Keskinen (2010), and two reports of innovation results D5.2 and D5.3 in www.roadidea.eu The following analysis of the key results is concentrating on road weather aspects and those ideas that support better road weather services.

The analysis of the European transport information system has shown that the working hypothesis of ROADIDEA is correct. Effective accessibility to all kinds of useful background information is a prerequisite for innovating and developing new mobility services. Unfortunately data accessibility seems to be the highest barrier in Europe, due to poorly developed European-wide information systems and standards, in particular for road weather information. Whereas for general weather information, data is well standardized and accessible (though with high pricing in some cases), for road weather information data sources and formats are numerous. There are countries with full and open access to road weather information, and countries with hardly any access. European countries are still very inhomogeneous in many aspects, and this fact is reflected also in road weather data availability and standardisation. European Union integration process is going on towards the right direction, but sometimes its concrete manifestations seem to take too long considering the current severe problems in transport and climate.

To take a first step towards more homogeneous data availability in EU countries, ROADIDEA has made a recommendation to the Working Group of Standardisation of a minimal data set that should be available throughout the European Union. This could be the easiest way to start improving the present situation, as it is recognized that a full leap to open data policy would be just facing very heavy opposition, hindering the start of the process.

When and if data is available, the further steps bear no such high barriers. It is relatively straightforward to develop advanced data fusion and filtering methods and develop better road condition and road weather models for creation of innovative mobility services. These have been reported in several ROADIDEA deliverables. Technological information platforms already exits and have been used in ROADIDEA service pilots. Efforts to improve the level of standardization are still needed to create an information infrastructure, on top of which services can be built effectively.

A success story of ROADIDEA has been the development of a new friction model and slipperiness warning service with a pilot name “Pulp Friction”. It started from a popular idea in the first Innovations seminar, getting most votes from the audience for further development. During the two ROADIDEA project years, the initial idea went through the complete development cycle and has now reached a level of first pilot version of the service with first concrete user tests. Demonstration is shown on ROADIDEA web site (see example in Figure 3). Hippi et al. from the Finnish Meteorological Institute will present the first results in SIRWEC 2010.

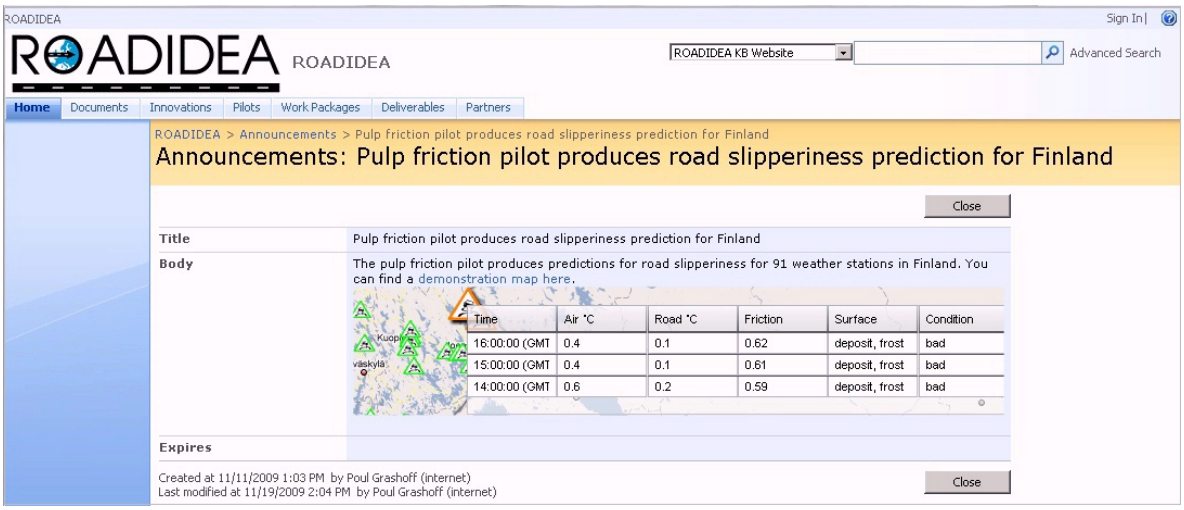

Figure 3. ROADIDEA pilot service "Pulp Friction" in http://www.roadide.eu

Acknowledgements

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5. References

Keskinen, A., 2010: Innovation Activities of ROADIDEA Project. 15th Conference of SIRWEC Standing International Road Weather Commission, Quebec City, Canada, 7 p.

ROADIDEA D5.2 Results of the First Innovation Seminar. Project report available from http://www.roadidea.eu

ROADIDEA D5.3 Results of the Second Innovation Seminar. Project report available from http://www.roadidea.eu

Saarikivi P. and A. Keskinen, 2008: ROADIDEA: Road map for radical innovations in European transport services. 14th Conference of SIRWEC Standing International Road Weather Commission, Prague, Czech Republic, 3p.