

FIRM

FEHRL INFRASTRUCTURE RESEARCH MAGAZINE



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All preceding work carried out during first half-year featured

... WHILE ECOROADS ALREADY GAINED KEY INPUT FROM TWO WORKSHOPS p.12-13

Two key workshops allow ECOROADS project to progress significantly



NINE ERA-NET PLUS INFRAVATION PROJECTS KICK OFF

Profound sharing and networking at joint Kick-off meeting >> p.6-7



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**INNOVATION FOR TRANSPORT
INFRASTRUCTURE**

Transport infrastructure is the lifeblood of modern society, but often struggles to meet demands and expectations on reliability, availability, maintainability, safety, environment, health and cost. FEHRL's role is to provide solutions for the challenges now faced and anticipate the challenges to come. Through innovation, the operation of transport infrastructure can address society's needs.

FEHRL encourages collaborative research into topics such as mobility, transport and infrastructure, energy, environment and resources, safety and security as well as design and production.

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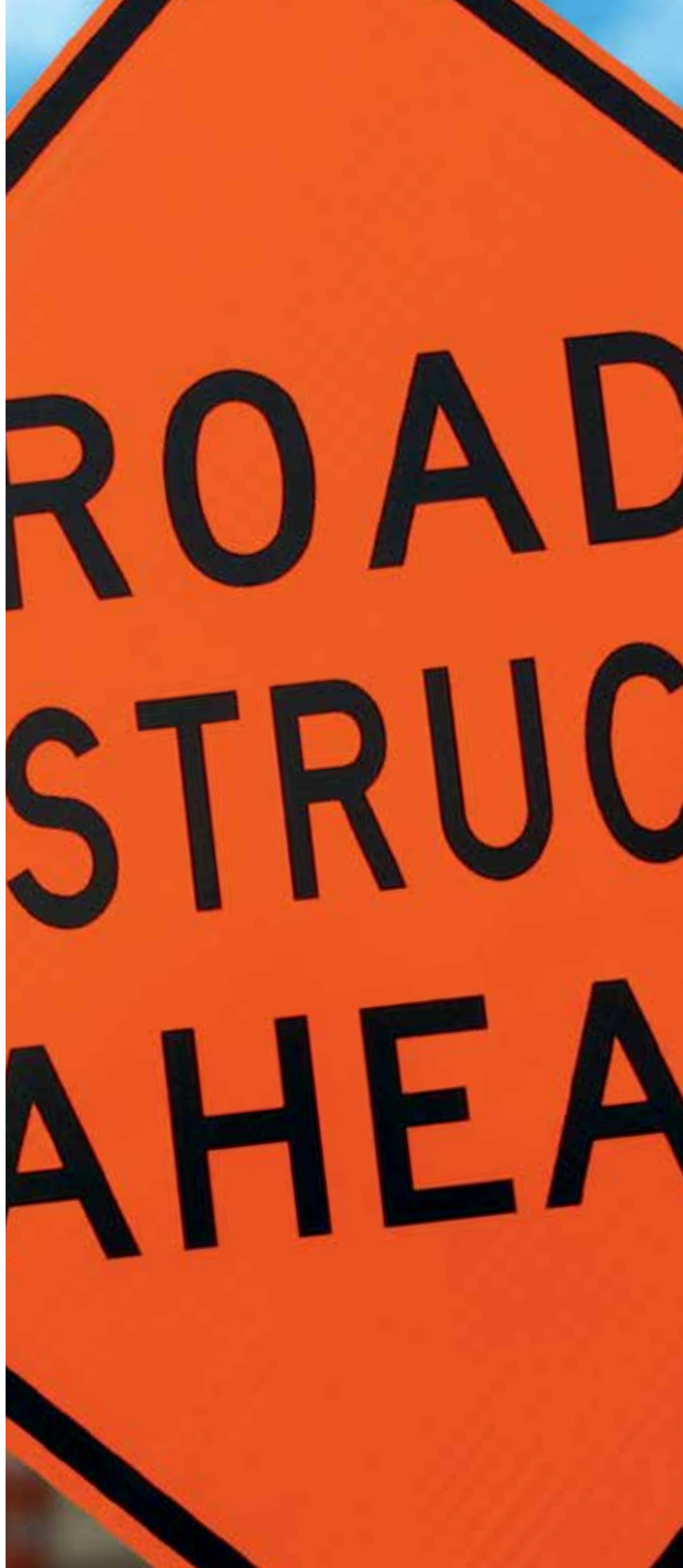
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Infra
An Infrastructure Innovation Programme

FEHRL BEHIND INFRAVATION KICK-OFF MEETING AND DEVELOPING NEW STRATEGY

Welcome to the seventh issue of FEHRL's Infrastructure Research Magazine (FIRM), which outlines how FEHRL provides transport infrastructure solutions for current and future challenges. In this issue, we highlight the nine new ERA-NET Plus Infraction projects and the recent event we organised to kick these off.

As you will read on pages 6-7, the event was the perfect occasion for the Infraction Management and Steering Group to present their expectations to the project members and key stakeholders, as well as for the project coordinators to outline the key details of their respective projects. FEHRL has proven to bring real added-value to Infraction, but its implementation has been far more complex and demanding than anticipated.

FEHRL is a cornerstone in Infraction by

1. Enabling the US participation for the very first time in an ERA-NET Plus programme.

2. Coordinating the scientific quality assurance of the programme and the funded projects.

3. Being responsible for the dissemination of the Infraction programme, which includes the incorporation of all the relevant project-related information.

On page 5, our President highlights some of the key activities planned by FEHRL in 2016. In addition, we will hold our next International Project Management (IPM) training on 14-16th June this year. Read more about this on the back page, along with details about TRA2016.

Also in this edition, we highlight the progress and plans for the three Horizon 2020 (H2020) projects we are coordinating, especially USE-iT and FOX (on pages 8-9), which are feeding into our flagship Forever Open Road (FOR) and FORx4 programmes. A first USE-iT and FOX stakeholder workshop was held on 20-21st January 2015, involving a lot of prior work to prepare concepts, while two stakeholder workshops have also been held for the ECORoads project in 2015, as can be read on pages 12-13.

On these pages, we also showcase the development of our other projects according to their respective FEHRL Research Area – namely REFINET and SENSKIN for Design & Production Systems (pages 10-11), ROSANNE and LCE4Roads for Environment, Energy & Resources (pages 14-15), FLOW for Mobility, Transport & Infrastructure (page 16) and SUP&R ITN, SETRIS and Foster-Road for Horizontal & Dissemination (pages 17-19).

We hope you enjoy your read and hope that 2016 proves to be a happy and successful year for you!

Thierry Goger
FEHRL Secretary General
(thierry.goger@fehrl.org)

For more information, see www.fehrl.org and:

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MESSAGE FROM STEFAN STRICK, FEHRL PRESIDENT

2016 will be another year of hard work for FEHRL to follow up the work started in the middle of last year on the “strategic projects” which reflect on the necessary development of cross-modal transport infrastructure. As you can read on pages 8-10, these are the USE-iT, FOX and REFINET projects, which are three H2020 Coordination and Support Actions. In addition to the usual business that FEHRL has always carried out and is well known for, we are convinced that FEHRL’s input to the vision for cross-modality will be of great added-value for EU and national strategies.



The social challenges and the demands FEHRL has set for itself necessitates the development of the sixth FEHRL Strategic European Road Research Programme (SERRP) in the near future to run from 2017-2021, which will focus on both research and innovation, cooperating with industry and moving to more implementation and deployment of results. In addition, we will partner to tackle cross-modality and generate organisational synergy.

A dedicated team has been put together, which will present its first results by the middle of 2016. A main emphasis will be placed on the cooperation with other European and international organisations.

FEHRL is already starting the year dynamically with many key project-related sessions at TRB2016 on 10-14th January and many plans for TRA2016 on 18th-21st April, including a FEHRL stand in the CEDR village and dedicated sessions for many projects. More news on this will be posted on the FEHRL website, newsletter and social media (see details at the bottom of page 4).

Happy New Year to all our readers and we wish you all the best for 2016.

Stefan Strick
FEHRL President
(praesident@bast.de)



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NEW AEROBI PROJECT KICKED OFF

The latest developments in low flying unmanned robots with arms and the associated fields of intelligent control, computer vision and sensors open the floor for robotic solutions, exploitable in the near term, in the field of inspection of difficult-to-access areas of the civil infrastructure in general, in particular bridges. The new 36-month H2020 Aerial Robotic System for In-Depth Bridge Inspection by Contact (AEROBI) project, driven by the bridge inspection industry and started on 1st December 2015, adapts and integrates recent research results in low flying unmanned robots with arms, intelligent control in robotics, computer vision and sensing, in an innovative, integrated, low flying, robotic system with a specialised multi-joint arm that will scan concrete beams and piers in a bridge for potential cracks on the surface or concrete swelling or spalling. FEHRL is leading Work Package 8 (WP8), which focuses on Dissemination and Communication Activities.

► For more information, contact Project Coordinator Philippe Chrobocinski at philippe.chrobocinski@airbus.com.

NINE INFRAVATION INNOVATION PROJECTS KICKED OFF

PROFOUND SHARING AND NETWORKING AT JOINT KICK-OFF MEETING

On 12-13th November 2015, nine new ERA-NET Plus Infravation innovation projects were successfully kicked off at a two-day meeting at the Diamant Center in Brussels, Belgium. Some 50 people attended from the Infravation Steering and Management Groups, selected key stakeholders from CEDR and the European Commission, as well as from the nine projects themselves. Feedback received was very positive: "The best networking event I have ever been to. There was a real sense of desire to help each other and a gradual realisation that we can all benefit from each other's work" said Dr Adrienn

Tomor from the University of the West of England and SHAPE project member. Her colleague, John Nichols from Texas A&M University, added: "I must say it was one of the best organised meetings I had attended in many years. I enjoyed myself immensely". SEEBRIDGE Project Coordinator, Rafael Sacks of Technion - Israel Institute of Technology, concurred with "A very informative and extremely well-conceived and organised kick-off meeting. I came away from it with a good sense of the vision of the project as a whole, and with good contacts with the other bridge research teams".

FIRST DAY FOCUSES ON BIG PICTURE AND IMPLEMENTATION

Peter Wilbers, ERA-NET Plus Infravation Coordinator, opened the meeting with a general introduction to Infravation. He highlighted that the programme represents a real common pot with central negotiation, funding and monitoring, which is unique compared to other ERA-NETs who usually have a virtual common pot. Also unique is the ambition of the 11 National Road Authority partners, including for the first time the US and Israel, since 100% of the budget, top up of the Commission included, goes into the projects with all the other costs in kind. Peter stressed the importance of Infravation to his organisation, Rijkswaterstaat, and recalled the great enthusiasm for the Call with 103 proposals received. He concluded that Infravation should be considered as a pilot and hopes for future such initiatives with even bigger volumes.

Liam Breslin, Head of the European Commission's (EC) Surface Transport Unit at the R&I DG, stressed his great expectations for the results and urged the project members to make the most of the limited time they have and to go for maximum collaboration and cross-fertilisation. He also outlined that the transnational pooling of resources for infrastructure research is ahead of other research areas thanks in part to CEDR and FEHRL and Infravation will hopefully act as a catalyst for this.

He was followed by Pieter de Winne of CEDR, who gave an overview of all the yearly CEDR transnational calls and outlined the synergies and differences between the CEDR and Infravation calls. He suggested that the CEDR Infravation and Research task groups should closely



Dr Adrienn Tomor



Dr John Nichols



Prof. Rafael Sacks

work together with Infravation and align technical content for future programmes and implementation.

David Kuehn from FHWA then gave the US perspective and highlighted this exciting milestone for both the US and FHWA. And Miguel Segarra of Dragados called for Infravation and its projects to be aligned with industry and put most of the efforts into demonstrations which are closest to market. Thibault Prevost from the French ministry of ecology, sustainable development and energy (MEDDE), outlined the expectations from the French funder, which in his case include learning from the projects for a new French "route du futur" programme.

FEHRL Secretary General, Thierry Goger, outlined the plans for communication and

outreach, including the need for a clear link between programmes and projects, and Katherine Petros of FHWA gave some inspirational ideas from the US on implementing results, taken from the Every Day Counts (EDC) programme. She confirmed in the ensuing panel discussion on the exploitation and implementation of results that products from Infravation could feed into EDC.

During this panel discussion, moderated by Oliver Althoff of TUV, panellist, Ruud Smit, representing ERTRAC, reminded everyone that the Infravation instrument and selected results from the projects could also be applied to other modes such as rail. He was supported in this by William Bird of the EC, who con-

firmed that a sustainable bridges project available for road could also include rail technology. And Kjersti Kvalheim Dunham of NPRA expects there will be some good breakthroughs from the projects that can be used very quickly in Norway.

Much networking and sharing of information then took place at the cocktail to mark the end of the first day.



Panel discussion on exploitation and implementation of Infravation results

NINE PROJECTS PRESENTED IN SECOND DAY

The second day gave the chance for participants to learn about the nine Infravation-funded innovation projects from presentations grouped together in three sessions. The first session covered four projects – FASSTBRIDGE, SUREBRIDGE, SEEBRIDGE and SHAPE (see box), that deal with the “Extension of life-span of bridges and justifiable postponement of maintenance”.

The second session, entitled “Promising developments in road surface pavements”, showcased the remaining five projects – ALTERPAVE, BIOREPAVATION, ECLIPS, HEALROAD and SEACON. As for the first day, vivid interaction continued between the projects, resulting in much networking and future appointments.

Project Coordinators also took part in two key internal meetings with the Infravation Management Group directly after the end of the meeting. The first one was to get acquainted

with their respective Scientific Panel member who will work with them to guide their project. And the second meeting saw a lively exchange on dissemination.



Scientific Panel members (from left to right: Paul Fortuin, Rijkswaterstaat; Jesus Rodriguez, Spanish Construction Technology Platform (PTEC); Johan Jonsson, Trafikverket; Shimon Nesichi, NETIVEI Israel; Katherine Petros, FHWA; Thibault Prevost, MEDDE); Thierry Goger, FEHRL (Chair)

NINE PROJECTS IN A NUTSHELL

ALTERPAVE : use of end-of-life materials, waste and alternative binders as useful raw materials for pavements construction and rehabilitation

BIOREPAVATION : innovation in bio-recycling of old asphalt pavements

ECLIPS : enhancing concrete life in infrastructure through phase-change systems

FASSTBRIDGE : fast and effective - solution for steel bridges life- time extension

HEALROAD : induction heating asphalt mixes to increase road durability and reduce maintenance costs and disruptions

SEACON : sustainable concrete using seawater, salt-contaminated aggregates, and non-corrosive reinforcement

SEEBRIDGE : automated compilation of semantically rich BIM models of bridges

SHAPE : predicting strength changes in bridges from frequency data safety, hazard, and poly-harmonic evaluation

SUREBRIDGE : sustainable refurbishment of existing bridges

► See www.infravation.net/projects for more information about the projects



► All materials can be downloaded from www.infravation.net. For more information, contact the Call Manager, Richard van der Elburg at richard.vander.elburg@rws.nl





GEARING UP FOR FIRST AND FOX STAKEHOLDER

Within the Horizon 2020 (H2020) programme, the European Commission has launched several initiatives to reflect on the necessary development of cross-modal transport infrastructure. Three European Coordination and Support Actions (CSAs), namely the USE-iT, FOX and REFINET* projects, have been granted to support this work. Partners from all transport modes and with various profiles (for example, research providers, industry, transport authorities) are actively involved in this work, which began in May 2015. Activities such as desk studies, surveys and workshops have been scheduled over the coming two years to collect information and reflect together on cross-modal transport. The findings will be used to produce a tangible European vision for cross-modal transport infrastructure, which identifies specific future technologies with the potential to overcome the key challenges facing the industry. In this article, the progress made so far within the USE-iT and FOX projects (both coordinated by FEHRL) is outlined, while on page 10 you can read more about REFINET.



PROGRESS TO-DATE

In July, the Work Package (WP) leaders met to discuss the project outcomes and challenges. A general framework on how

to proceed with the work was established, including synergies with REFINET. Since both the USE-iT and FOX projects involve high interaction with the transport industry and research partners, two stakeholder workshops were planned, the first of which took place on 21st January 2016. In combination with REFINET, a stakeholder list was drawn up with input from the partners and key stakeholders were invited to the workshop.



The USE-iT and FOX consortiums identified areas, relevant to the major challenges facing all modes (road, water, rail, air). A detailed literature review was conducted focusing on these areas and state-of-the-art technology and best practice with the potential for application in at least one mode was identified. Concepts relating to each area were identified to better organise a best practice overview across all modes. This was used to produce posters of the technologies to be displayed and discussed at the first workshop.

AREAS AND CONCEPTS DEFINED

USE-iT aims to better understand the common challenges experienced across transport modes and develop a set of common research objectives for User Information (WP 2), Safety and Security (WP 3) and Energy and Carbon (WP 4).

WP2 identified ITS/ICT, Intermodality and Legislation/User Acceptance as important areas for all transport modes to focus on. Examples of concepts within these areas are active infrastructure across all modes, advanced traveller information systems, smart navigation systems or mobility as a service (MaaS). Technologies and good practice with the potential to contribute to a particular concept were identified, for example smart ticketing can help to create co-ordinated travel processes, and multi-model route planners can improve the availability of advanced traveller information. A similar process was carried out by the other WPs.

WP3 identified Safety of people & Safety of goods and Security of people & Security of goods as key areas. Concepts in this WP include: in-vehicle technologies, for example fatigue warning systems; accident reduction measures such as setting safety targets; and surveillance technologies such as total airport security systems (TASS).



For WP 4, the primary areas of focus are Powering Transport, Constructing and maintaining infrastructure and vehicles, and Operating and managing transport systems. Concepts within these include improving fuel efficiency, low carbon materials and design, efficient technology and automation and behaviour change.

*USE-iT stands for users, safety, security and energy in transport infrastructure; FOX stands for Forever Open Infrastructure across (X) all transport modes; REFINET stands for rethinking future infrastructure networks. As Project Coordinator of USE-iT and FOX, FEHRL is maximising the synergies between them, as well as with the REFINET consortium, where FEHRL is project partner, to bring additional benefits of each.

USE-iT WORKSHOP

Examples of technologies relating to these concepts are warm mix asphalt, land-use planning tools and driver training.

FOX will ensure the continuity and reinforcement of networking among stakeholders in the road, rail, water and air sectors by defining a cross modal approach in Construction (WP 2), Maintenance (WP 3), Inspection (WP 4) and Recycling & Reuse (WP 5) of transport infrastructure. The concepts for WP 2 are Innovative materials, Construction and Design methods, and include technologies such as self-healing concrete, performance related specifications and fibre glass grid reinforcement materials. For WP 3, the concepts are Preventative maintenance, Rehabilitation, Reconstruction, Asset Management. Technologies cover ballast preventive maintenance, diamond grinding, ultrafast concrete and estimating end-of-service-life of hydraulic structures. WP 4 is divided into the two concepts of Surface condition and Structural condition of the infrastructure. The technologies identified include multifunctional rail inspection devices, overhead camera inspection and ground penetrating radar. WP 5 is divided into the concepts of Asphalt to asphalt recycling, Metal to metal industry, Use of secondary materials (waste) into construction, Use of C&D (construction and demolition) waste, Use of plastics and Reuse of products. Technologies include rail sleepers made from recycled plastic, recycling of reclaimed asphalt pavement and recycling metal rail components.



FIRST STAKEHOLDER WORKSHOP

All four traffic modes – road, rail, waterways and airfields – were well represented by industry and research area experts from various EU countries such as UK, Belgium, France, Germany, Austria, Norway, Sweden, Norway, Spain, Portugal, Poland, Lithuania, Ukraine and many more. The workshop obtained feedback on the concepts identified during the literature search and generated ideas on the various technologies identified.



SURVEY

An on-line survey (at goo.gl/qfWXzR), which focuses on technology transfer across transport modes, was distributed to stakeholders prior to the workshop. Outputs from this activity helped the WP leaders to better design and organise the workshop. A midterm report is being produced summarising the initial findings, this will be made available to all interested experts.

All project activities aim to tackle and mitigate some of the greatest challenges of transport, which include the fragmentation of the transport network and the potential for a stronger interoperability on many levels including the ones defined in FEHRL's Forever Open Road (FOR) programme and FORx4 initiative

of infrastructure, technology, governance and customer. The need for one, integrated, future European transport system is inevitable in view of autonomous technologies and driverless vehicles, etc. The work undertaken by USE-iT and FOX will lead to new roadmaps outlining research strategies and implementation stages to support improved co-modal cooperation.



► For more information, go to www.useitandfoxprojects.eu or contact Project Coordinator Thierry Goger at thierry.goger@fehl.org under "FORx4 initiative on transport infrastructure" group

USE-iT PARTNERS



FOX PARTNERS





CHOOSING THE RIGHT STAKEHOLDERS FOR REFINET

PARTNERS



The REFINET project will create a sustainable network that integrates the relevant stakeholder representatives of all transport modes (road, railway, maritime, fluvial, etc) and transport infrastructure sectors to create a shared European vision of how the multimodal European transport infrastructure network of the future (including, but not only, cross-modal aspects) should be specified, designed, built or renovated, and maintained. To do this a Strategic Implementation Plan (SIP) that will be elaborated to define the innovation activities required to make this vision a reality. This networking activity will focus on analysing the challenges to be tackled by the European transport infrastructure operators in order to increase the performance and productivity of the multi-modal transport infrastructure and develop the associated action plan.

In July 2015, the REFINET stakeholder database was initiated and about 600 members have shown interest in participating up to now. The objective is to reach about 1,000 members from 40 countries at the end of the 24-month Horizon 2020 CSA.

The partners are now working on the definition of the REFINET multi-modal transport infrastructure (RMMTI) model, which will be the reference for

the future development of European transport infrastructure. In this task, different documents issued by different Technology Platforms, transport sectorial associations, European Commission (EC) and national governments are being analysed in order to integrate their partial approaches (by transport mode, technical aspects, business models, etc) into a unified multi-modal transport infrastructure model. In parallel, a similar approach is being followed to select the KPIs that will allow the European transport infrastructure managers to benchmark them against the RMMTI model. The most common KPIs currently available for different transport infrastructures will be analysed, and the most relevant from the RMMTI model perspective selected.

Additionally, two workshops with the partners and invited experts from the stakeholder database have been organised. On 21st October, a workshop was organised with experts contacted through the National Construction Technology Platforms (NTPs). Some 14 experts from seven countries and three REFINET partners (PTEC, TECNALIA and DRAGADOS) participated in this event. The participants agreed to organise the next workshop on 8th March 2016 to present the RMMTI model.

On 2nd December, a workshop was organised at IETcc in Madrid, Spain, which focused on analysing the technological demands on transport infrastructures. Some 18 experts participated from REFINET members and other organisations. The conclusions of this workshop will be taken into account when developing the RMMTI. And the latest REFINET project meeting took place on 3rd December at the Tecnalia office in Madrid where the activities for the next months were decided.

A REFINET newsletter will be published regularly, with the first one distributed by PTEC mid-November through the REFINET stakeholder network and the construction NTPs network. Another workshop will be organised on 16th March 2016 at the Arup offices in London, UK, and an invited session on the three related CSAs in transport infrastructures (REFINET, FOX and USE-iT) at TRA 2016 on April 20th in Warsaw, Poland. The REFINET website (www.refinet.eu) will be available within the new ECTP website.



► For more information, contact Project Coordinator Alain Zarli at alain.zarli@cstb.fr.



SENSKIN

USING QUESTIONNAIRE ON USER REQUIREMENTS FOR SENSKIN

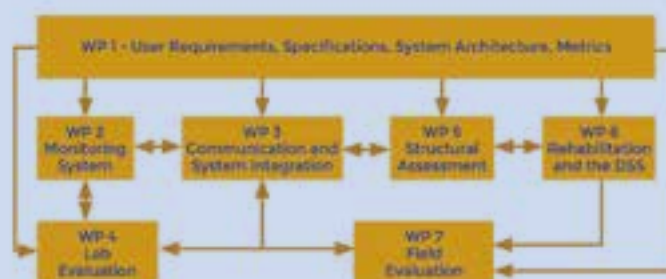
SENSKIN is a 42-month Horizon 2020 project that launched its activities with the kick-off-meeting in Athens, Greece, on 2nd -3rd June 2015. Coordinated by the Greek Institute of Communication & Computer Systems (ICCS) and involving 13 research institute, university and SME partners from across Europe, SENSKIN is developing an inexpensive, low power, wireless, skin-like sensor that offers spatial sensing of irregular surfaces (transportation bridges in particular). This sensor will be able to withstand and monitor large strains and to self-monitor/report. Emerging Delay Tolerant Networks technology will be also applied so that the output of the sensors is transmitted even under difficult conditions, such as, in the case of an earthquake, where some communication networks are inoperable. Additionally, SENSKIN as a monitoring system will be supported by a Decision-Support-System for proactive condition-based structural intervention under operating loads and intervention after extreme events. The SENSKIN technology will be implemented in the case of bridges and tested, refined, evaluated and benchmarked on an actual bridge.

During the first six months of the SENSKIN project's runtime, the project consortium has focused its work on the development of the project end-user requirements that will lead to the definition of the system specifications and final system architecture. The end-user operational and functional

requirements have just been finalised involving a questionnaire on user requirements, with the strong involvement of the project internal end-users and other external parties. The latter included the participation of 17 authorities (motorways, bridge operators, highway departments etc) from Turkey, Poland, UK, Greece (2), Ireland, Austria, Ukraine, Germany (2), Hungary, Estonia, Slovakia, Sweden, USA, Italy and Iceland. At the same time, the validation scenarios, metrics and performance benchmarking metrics have been identified. The consortium is also in the process of translating these user requirements into the system specifications and defining the overall final system architecture and this work is

expected to be finalised imminently. Following that, the SENSKIN technical activities will start early this year.

In parallel, several dissemination activities have begun for the project, including a press release sent out to various European and national media, a dedicated website and Linked In group and a flyer. Many more are planned in the near future within the Dissemination Plan, which has been put together and is coordinated by FEHRL. Following the kick-off meeting, the first plenary meeting for all partners was held on 10-12th November 2015 in Stuttgart, Germany to carry out a detailed planning of all the activities according to the 10 Work Packages shown here below.



All WPs receive input from WP10 Project Management. All WPs provide input to WP8 Exploitation of Results and WP9 Dissemination and Communication Activities.

PARTNERS



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► For more information, contact Project Coordinator Angelos Amditis at a.amditis@iccs.gr or see www.senskin.eu



TWO KEY WORKSHOPS ALLOW ECORoads PROJECT TO PROGRESS SIGNIFICANTLY

The Horizon2020-funded Effective and Coordinated Road Infrastructure Safety Operations (ECORoads) project aims to overcome the barrier established by a formal interpretation of the two Directives 2008/96/EC (on road infrastructure safety management) and 2004/54/EC (on tunnel safety inspections), that in practice do not foresee the same Road Safety Audits/Inspections (RSA/RSI) to be performed on open roads and in tunnels. To overcome this barrier, the project will establish a common enhanced approach by applying the concepts (RSA/RSI) of the Directive 2008/96/CE to tunnels and in transition areas between tunnels and open roads, without jeopardising (but rather complementing) the usual tunnel safety management operations. The approach is divided into several phases, which include:

- **Overview of the application of the Directives in the Member States and the extent of the differences between them.**
- **Series of workshops with stakeholders (European tunnel and road managers).**

- **Exchange of best practices and experiences between European tunnel experts and road safety professionals.**
- **Joint safety operations on some European road sections with both open roads and tunnels, conducted by an international team of road and tunnel safety experts in five different European locations. Tunnel operations will be conducted by tunnel experts accompanied by road safety experts (as observers) and vice-versa. This way, an actual cross-fertilisation between the two groups of experts will lead to an enhanced approach to the road infrastructure safety management.**
- **Recommendations and guidelines for the application of RSA and RSI concepts within the tunnel safety operations.**

Two stakeholder workshops have already been held in 2015 to get key input as described below. The first one was preceded by a Project Management Group meeting, where the five test sites were approved (see box).

FIRST STAKEHOLDER WORKSHOP REVIEWS EXISTING PRACTICE ON APPLICATION OF ROAD INFRASTRUCTURE AND TUNNEL DIRECTIVES

On 30th September, policymakers, road safety experts, engineers, tunnel and road auditors from Europe came together in Brussels to discuss the applicability of the two Directives. The analysis and review of national practices regarding the application of the two Directives were discussed with examples from Ireland, Czech Republic, Germany and the Netherlands. The process for the joint safety operations (final selection of five test locations across Europe and input for the definition of the procedures and priorities for the joint visits) was also established.

Based on the input from the experts present, the workshop concluded that the projects' synchronised tunnel and road audits would require one or more people acting as "task leaders/facilitators", ensuring the site visits will deliver the expected results. Inspection teams should consist of 4-5 experts (at least two for each specialisation), who



ECORoads TEST SITES IN FOCUS

The project partners met on 29th September to discuss the 14 pre-selected sites for inspection from 10 countries. The applications were received within the deadline of the first selection and were based on pre-established guidelines and ranking criteria. Applications for test sites are to remain open until mid-2016. The following five test sites have been preselected.

1. **Kennedy tunnel in Antwerp, Belgium**
– high percentage of heavy goods vehicles.
2. **Tunnel Rennsteig on BAB A71 in Germany** – in total four tunnels, heavy traffic and no dangerous goods.
3. **Tunnel Demir Kapija part of Corridor X in Macedonia**; works are still ongoing; bi directional.
4. **Krabbe tunnel in Tirana, Albania** - new project with one tube already open.
5. **Strazevica tunnel in Serbia** - close to Belgrade bypass

ROAD SAFETY EXPERTS

Road Safety Audits and Inspections, according to 2004/49/EC



Tunnel safety inspections, according to 2004/49/EC

TUNNEL EXPERTS

should be left free to discuss and disagree.

There was also agreement that the transition areas are bi-directional: entering in the tunnel from the open road and going into the open road from the tunnel. The extension of such transitions will be decided case by case, according to the speed. Other physical and operational characteristics were also discussed. The inspection criteria will be based on existing national rules, which will be provided by some partners. Check lists will facilitate the work, otherwise a clear list of expected results should be provided.

ROAD SAFETY OPERATIONS ASSESSED AT SECOND BRUSSELS STAKEHOLDER WORKSHOP

On 19-20th November in Brussels, a second stakeholder workshop was held to discuss road safety operations on open roads and tunnels as well as European examples of good practices.

Dirk Lauwers from Ghent University presented the theoretical framework for RSAs and infrastructure safety management. Country discrepancies in safety were outlined, as well as future opportunities for southern European countries to improve infrastructure design, road audits and maintenance and an extension of road

safety management procedures to roads not covered by the TEN-T network.

Application of RSIs and procedures in Germany on open roads and tunnels were presented by Andreas Vesper and Christof Sisternich from BAST. The safety operations, major issues and best practices in Italy were outlined by Carlo Ricciardi from the Italian Ministry of Transport & Infrastructures and Paola di Mascio from University of Rome "Sapienza".

On the second day, the joint tunnel and open RSI experiences from across Europe were discussed with examples and tunnel statistics from the SEETO region (presented by Liljana Cela from SEETO) and Norway (Arild Petter Søvik from NPRA).

The planning of the joint safety operations within ECORoads was presented by An Volckaert and Xavier Cocu (BRRC). Definition of common procedures, field tests and reporting and feedback would be done in accordance with the expertise, dual approach (road and tunnel inspections) and knowledge gathered by the experts in the participating countries. Potential risks and evaluation criteria would be included in the final report, together with a checklist and audio-visual materials.

PARTNERS



► For more information, contact Project Coordinator Adewole Adesiyun at Adewole.adesiyun@fehrl.org or see www.ecoroadsproject.eu



ROSANNE CARRIES OUT FIRST ROUND ROBIN ROLLING RESISTANCE TESTS

Environmental issues have become an important part of the decision-making processes for road projects in many European countries. Energy/fuel consumption of a vehicle and therefore road traffic CO₂ emissions are influenced by rolling resistance. Although the influence of tyre characteristics on rolling resistance has been well known for many years, recent research has demonstrated that road surface characteristics also play a significant role. However, further scientific understanding of the contributions of the various factors affecting rolling resistance is necessary for the new design of road infrastructure and pavements able to reduce the fuel consumption and CO₂ emission. And as a first step, robust methods of measuring rolling resistance in the field must be developed. This challenge is being addressed in the 36-month FP7 project ROSANNE, whose objective is to prepare for the international and European standardisation of measurement methods for the representative and accurate characterisation of road surface rolling resistance properties. Based on previous work in the MIRIAM (Miriam-co2.net) project, further investigation was made of the influence of various effects on rolling resistance which need to be

controlled, such as temperature, tyre load, tyre inflation pressure, water film on the road and speed. After a comprehensive review of existing measuring road based methods and devices, a draft measurement procedure was developed for the harmonised rolling resistance classification of road surfaces across Europe.

In order to assess the proposed method and compare existing trailer-based measuring devices, an experimental validation was organised in September 2015 in Nantes (France). The experiment was performed as a "Round robin test" (RRT), in which the four test trailers available in the project belonging to partners BAST, TUG and BRRC participated, plus an external one. This test plan included measurements of rolling resistance on 12 sections of the project partner IFSTTAR's test tracks and six traffic roads around the IFSTTAR facility. Measurements on the test track could be made in perfectly mitigated conditions, whereas measurements on traffic roads introduced realistic conditions such as road unevenness or slopes. Measurements were repeated several times in order to address the reliability of the method. In parallel, alternative methods for rolling resistance meas-

urements were operated: the coast-down method and the energy consumption method, using a specifically-equipped passenger car. As well as the comparison between trailer-based and alternative methods with regard to pavement classification, a link between the direct measurement and energy consumption of rolling resistance will be provided. Finally, comprehensive measurements of the road surface characteristics for all test sections (geometry, texture, unevenness, etc) and fuel consumption were performed with project partner VTI's Road Surface Tester system. The results are under analysis and will be presented in spring 2016. No doubt they will lead to a significant step for roads to contribute to a better environmental performance.

These tests follow the two rounds of skid resistance testing already carried out during the first half of the project and reported in the July 2015 issue of this magazine.



► For more information, go to www.rosanne-project.eu or contact Project Coordinator Manfred Haider at manfred.haider@ait.ac.uk. [in](#)

PARTNERS





BETA VERSION OF THE LCE4ROADS SOFTWARE TOOL

The LCE4ROADS project, funded by the European Commission under the FP7 Programme, has already developed a beta version of its software tool. The goal of this project, entitled *Life Cycle Engineering approach to develop a novel EU-harmonized sustainability certification system for cost-effective, safer and greener road infrastructures*, is precisely to promote technologies and materials in the road construction sector that significantly reduce the pollutant emissions and the use of natural and financial resources by means of the certification system establishment.

The tool is based on the integration of the LCE4ROADS methodology and the key performance indicators (KPIs) settled along the project for road infrastructures by means of process modelling and simulation, which aim to evaluate the global performance of road stages according to a multi-domain perspective. The tool also aims to boost and facilitate the implementation of the methodology in all EU Member States and other countries.

This tool will be able to evaluate and declare the results of road projects under study to obtain the LCE4ROADS certification. In case the project does not match the required criteria, the tool will provide recommendations about

which KPIs are out of range to improve the LCE4ROADS certification achievement and support the decision making of relevant stakeholders.

For this purpose, a beta version has already been designed with an attractive and friendly interface. To achieve this type of interface, prospective user experience and previous tool and platform appearance have been taken into account by means of a detailed analysis.

This beta version software allows users to create projects and complete them with information about different aspects. For example, the type of road (initially focused on TEN-T roads and motorway), dimensions (Length, total surface), expected lifetime, main product (asphalt or cement), location (country selection) or the level of certification (light/complete) or stage (planning and design/after construction/operation).

The software is fed by a full comprehensive in-house developed database of materials, processes for road construction, maintenance and disposal, and other relevant information, such as technical and social country-specific legal requirements, gathered from the results achieved along the project, literature and material resources and supplied by pro-

ject partners. The information provided by the users into the tool combined with this in-house database and the implemented algorithms based on the methodology will enable them to determine the status of their respective projects to obtain the LCE4ROADS certification.

Although the tool has been created as desktop installation software, its interface is based on html format to ensure a friendly and up-to-now look. The tool can be installed in Windows 7 or newer and is being developed using standard open source projects.

The final version of the tool, expected for March 2016, will integrate the multi-domain (environmental, economic, social and technical) certification methodologies (light or complete) for TEN-T roads developed during the LCE4ROADS project.

PARTNERS



► For more information, go to www.lce4roads.eu or contact Project Coordinator Rocío Fernández Flores at rocio.fernandez.flores.EXT@acciona.com. [in](#)



GOOD HEADWAY MADE DURING FIRST SIX MONTHS OF FLOW PROJECT

During its first six months, the FLOW project has gone through an extensive process to develop a multi-modal definition of congestion and to determine which indicators can best assess whether a walking or cycling measure will (either positively or negatively) influence congestion. Of the 100+ sources reviewed on the topic of congestion, none include non-motorised modes as independent transport modes capable of increasing and/or decreasing congestion levels.

Having reviewed the existing literature, FLOW developed and tested an online survey and identified 165 professionals with expertise in walking, cycling, transport modelling, planning and/or engineering to invite to fill it out. 63 complete responses were received from 20 countries.

Results confirm that little is known about the concrete impacts walking and cycling can have on congestion reduction and that in many European cities walking and cycling measures are not being implemented due to fear of congestion.

Nine survey participants were invited to join the FLOW consortium at a workshop in Dublin on 5th November to provide further input and to exchange and build knowledge with members of the FLOW consortium, which includes PTV,

Walk21, the European Cyclists' Federation, the FEHRL secretariat and the FEHRL members BaST and TRL.

The survey results, FLOW's draft multi-modal definition of congestion and draft performance indicators were presented at the workshop. Discussion groups focussed on:

- **Multi-modal definition of congestion**
- **Performance indicators capable of assessing the congestion-reducing potential of given actions**
- **Examples of walking and cycling measures that have the potential to reduce urban congestion**
- **Communication around walking and cycling in the context of urban congestion (reduction).**

Based on feedback received, the FLOW team is confirmed in its general direction but making revisions to its definition and performance indicators.

FLOW is a research and innovation project under the Horizon 2020 topic of MG-5.3-2014 – tackling urban road congestion. It began in May 2015 and runs for three years.

► For more information, see www.h2020-flow.eu or contact Project Coordinator Bernard Gyergyay at b.gyergyay@rupprecht-consult.eu or Bonnie Fenton at b.fenton@rupprecht-consult.eu



FLOW IN BRIEF

Despite the acknowledged benefits of walking and cycling in terms of health, travel-time reliability and cost effectiveness, the effects of walking and cycling on urban road congestion are still under-researched. FLOW is working toward a paradigm shift wherein non-motorised transport, often seen from a transport policy perspective simply as a nice "extra", is placed on an equal footing with motorised modes in its ability to reduce urban congestion. The EU FLOW project is developing a user-friendly methodology, involving transport modelling, to assess the effectiveness of walking and cycling measures to reduce congestion.

GETTING INVOLVED IN FLOW

The FLOW project is looking for 9 Exchange Cities and 25-30 Follower Cities to further build on the idea of walking and cycling as potential congestion reducers. For more information on becoming a FLOW Exchange or Follower City, go to www.h2020-flow.eu/for-cities/

FLOW is also looking for transport consultancies actively involved in the modelling of walking and cycling. More information is available at: www.h2020-flow.eu/for-businesses/

PARTNERS



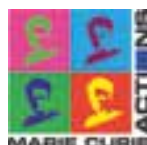
The FP7-funded Sustainable Pavements & Railways Initial Training Network (SUP&R ITN), which started at the beginning of October 2013, aims to form a new generation of multi-disciplinary European researchers and professionals capable of conceiving, planning and executing sustainable road and railway infrastructures. SUP&R ITN has offered training-through-research for 15 young researchers with a consortium of universities, research centres and companies/industries from five countries (UK, Italy, France, Ireland and Spain). The SUP&R ITN has implemented six Work Packages (WPs) with The Nottingham Transportation Engineering Centre (NTEC) at the University of Nottingham leading the training, management and dissemination WPs and each hosting institution supporting the training and research of individual researchers through three scientific research WPs.

This training-through-research programme is leading 12 early stage researchers in investigating and/or developing roadways and railway components by maximising recycling of secondary materials and minimising impact by using practical methods and best practices for sustainability. Over the first year of their projects, the researchers purchased the necessary resources and equipment and are now obtaining the planned results towards the main aim of the programme: improving the sustainability of road and rail systems throughout their life-cycle by systematically integrating sustainability at an early stage in the product design. The main results are expected for the second period of the project (2016-2017). Furthermore, within this framework three experienced researchers are developing a ready-to-use, transferable tool to enable a sustainable design of transport infrastructure technologies. Another component of SUP&R ITN is dissemination.

- For more info visit www.superitn.eu, contact info@superitn.eu or directly the project manager Dr. Davide Lo Presti at davide.lopresti@nottingham.ac.uk



SUP&R ITN
Sustainable Pavements & Railways
Initial Training Network



HOW SUP&R ITN OFFERS EARLY RESEARCHER TRAINING IN SUSTAINABLE PAVEMENTS & RAILWAYS



The photos above are from one of the two outreach activities held over the last year. Researchers have also disseminated their research through journal publications and various conference podium and poster presentations (including the 8th RILEM International Symposium pictured above).

Additionally, SUP&R ITN has already delivered, or is about to deliver, the following network-wide training events for the researchers, some of them were/are open to external participants.

- **September 2014 – Nottingham Training Week: Introductory lectures, practical workshops, lab visit and team building events**
- **March 2015 – Winter Workshop 2015, Railways, Dublin, Ireland: Theoretical lectures, practical**

workshops, site visit, team building events

- **June 2015 – Spring School 2015, Micromechanical Analysis of Asphalt Concrete, Delft, Netherlands: Theoretical lectures, practical workshops, team building events**
- **(OPEN) September 2015 – Summer School 2015, Sustainability Assessment of Transport Infrastructures, Palermo, Italy: Theoretical lectures, practical workshops, team building events (summerschoolpalermo.superitn.eu)**
- **(OPEN) Winter School 2016, “From Research on Sustainable Pavement and Railway to Its Implementation in Practical Engineering Projects”, will be held in February in Granada, Spain. (winterschoolgranada.superitn.eu)**

SUP&R ITN will have a special dissemination event within the FEHRL stand at TRA 2016, which will take place in Warsaw, from 18th to 21st April 2016.

FULL PARTNERS





Project members from left to right: Ovidiu Dumitrache (ACARE), Fernando Liesa (ALICE), Caroline Almeras (ECTRI), Cliff Funnell (Waterborne), Andy Doherty (ERRAC), Xavier Aertsens (ERTRAC), Joost DeBock (EC) and Mark Robinson (UNEW).

REVIEW OF FIRST SIX MONTHS OF SETRIS

PARTNERS



The overall aim of the SETRIS project is to deliver a cohesive and coordinated approach to research and innovation strategies for all transport modes in Europe, by enabling the following five transport-related European Technology Platforms (ETPs) to work together:

ACARE Advisory Council for Aviation Research and Innovation in Europe

ALICE Alliance for Logistics Innovation through Collaboration in Europe

ERRAC European Rail Research Advisory Council

ERTRAC European Road Transport Research Advisory Council

WATERBORNE

These ETPs have each developed their own strategic research and innovation agendas (SRIAs) and each is at a different stage of delivery and 'maturity'. Whilst some successful cross-ETP working is already established, SETRIS will provide the building blocks for tighter cooperation between the ETPs, their members and stakeholders.

In particular, the SETRIS objectives are being made operational through their application to two specific themes: "Connecting passengers for seamless travel and sustainable mobility" and "End to end logistics". These are the subject matter for Work Packages (WP) 1 and 2, respectively.

Initial work in WP1 has been identifying 'challenges' to the SETRIS objectives by assessing the levels of collaboration already underway between ETPs and noting gap areas where further collaboration between the ETPs is desirable in order to attain truly integrated urban and long distance transport systems. In WP2, work is underway to define a "truly integrated transport system for logistics", such that freight can operate synchronously - that is, where a customer is offered and integrated and sustainable solution for their transport requirements through the coordination of logistics chains, transport chains and infrastructure. Key characteristics and requirements, trends and policies impacting the process, and enablers and barriers to achieving the truly integrated transport system for logistics have been offered. Key stakeholders addressing this concept, including their role and expected developments, have also been identified, in a so-called cross-modal group and experts on Long Distance Freight Transport.

Progress is also underway in WP3, "Modal SRIAs and Roadmaps", to enable the ETPs to individually consider issues linked to their specific mode and/or par-

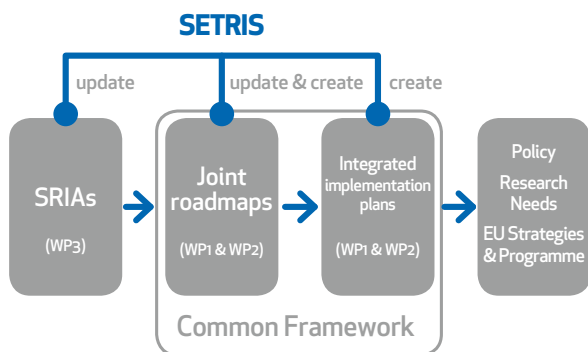
ticular activities. For example, ACARE have completed a status report on their SRIA published in 2012, with the ACARE General Assembly in October 2015 approving activity to review and update the content, where necessary, in response to changing global economic, transport and environmental factors. Once agreed by the European Commission (EC), the report will be made publicly available.

In the frame of WP5, SETRIS supports the TRA conference by providing the necessary input to the preparation of the 2016 conference in Warsaw with the participation of the different ETPs to the different Committees and associated exhibition. Moreover, it has developed by the end of 2015 a number of draft guidelines and recommendations on TRA overall governance, based on past experience. These are due for discussion by the TRA Management Committee and their final version, to be issued in April 2017, are expected to strongly consolidate future TRAs and assure their long-term sustainability.

Progress has been assessed and next steps defined at two project meetings on 15th September in Brussels and 17th December in Newcastle, UK. By identifying synergies between the transport ETPs' SRIAs, SETRIS will support the definition of implementation plans for joint SRIAs in a coordinated framework of running ETPs.



► For more information, see newrail.org/setris/ or contact Project Coordinator Belinda Fairbairn at belinda.fairbairn@ncl.ac.uk.



PROJECT COORDINATED BY



SUPPORTED BY



ERTRAC SUCCESSFULLY PUBLISHED ITS ROADMAP ON AUTOMATED DRIVING

First mentioned in the July 2015 issue of this magazine (on pages 12-13), the roadmap on “Automated Driving” has been issued by ERTRAC after one year of work, gathering experts from all over Europe from the industry, research institutes and public authorities. This joint European roadmap is delivered as a reference, offering firstly a common set of definitions for the levels and systems, and secondly a joint approach of R&D and deployment for automated driving systems. This joint view on the challenges ahead and how to progress step by step is very useful for both the research community and the public authorities.

The roadmap, finalised during the summer, has just been distributed in October during the ITS World Congress (itsworldcongress.com) in Bordeaux, France. It was distributed both on the booth of ERTRAC and the European Commission, as well as mentioned during several sessions of the conference. The document was well received as a useful reference at European level. It was found particularly useful by public authorities, from national ministries as well as from regions and cities, many of whom are currently planning testing and demonstration activities.

From the ERTRAC side, there is a clear willingness to pursue this work on Automation by monitoring the evolution of the technologies development, as well as keeping an updated view on all the tests taking place in Europe. The challenge in the coming months will be to get a common European approach to allow these tests. And during the coming years, regulations at national and European levels will need to be adapted to enable the market introduction of these new automated driving systems. Since vehicles are meant to drive across Europe, a common regulatory framework is mandatory.



Based on the recommendations of the ERTRAC roadmap, the European Commission will fund several important activities thanks to the Horizon 2020 programme: for testing passenger cars, trucks and urban systems at various levels of automation in different environments, but also to investigate safety and user acceptance, which are very important factors to assess the possible deployment of the automated driving systems.

To inform the research community about this funding from Horizon 2020, under the call “Automated Road Transport” in 2016-2017, ERTRAC organised an Information Day in Brussels on 6th November, during which each topic of the call was presented by European Commission officials. Information about this event, including presentations afterwards, is available on: www.ertrac.org/index.php?page=infoday-automation

The Automated Driving roadmap is available for download on: www.ertrac.org/index.php?page=ertrac-roadmap



► For more information, contact Xavier Aertsens at xavier.aertsens@ertrac.org or see www.ertrac.org [in](#)

14-16TH JUNE 2016

FEHRL INTERNATIONAL PROJECT MANAGEMENT TRAINING COURSE



Do you need to learn about the procedures and techniques needed to work effectively in EC and other multinational projects. If so, then sign up now for the next **FEHRL International Project Management (IPM) training course** to be held in Brussels on 14-16th June 2016.

This course will focus on building teamwork and cooperating with experts from the public and industrial sectors. Workshops will be performed in English by professional trainers, qualified project managers and EC officials.

- For more information, contact Isabelle.lucchini@fehrl.org.

18TH-21ST APRIL 2016

COME AND JOIN US AT TRA 2016



FEHRL will be present again at TRA2016 on 18th-21st April 2016 in Warsaw, Poland, so save the date now and come and meet us there !

- See www.traconference.eu for more details on TRA2016.



FEHRL MEMBERS



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