



REFINET

REthinking Future Infrastructures NETWORKS

Newsletter No.1
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Project coordinator



Partners

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ARUP



DRAGADOS



tecnalia



PRESENTATION

This is the Newsletter No.1 of the REFINET CSA where Arup, CSTB, D'Appolonia, Dragados, FEHRL, PTEC, Tecnia and UIC are participating.

A first section of this Newsletter includes contributions on REFINET presentation by CSTB as coordinator, on REFINET background by Dragados as leader of Infrastructure & Mobility (previous reFINE) at ECTP and on REFINET WP3 progress by Tecnia as coordinator of this WP.

A second section includes background information on research and innovation activities in the field of transport infrastructures by two REFINET partners: Arup and D'Appolonia.

A third section includes information on coordination activities between three CSAs in Transport (REFINET, FOX and USE-it) by FEHRL and on the workshop with REFINET partners and experts from NTPs (October 21st, 2015) by PTEC.

Finally, a fourth section summarizes some news in the field of research and innovation on transport infrastructures.

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REFINET PROGRESS

Presentation of REFINET CSA



The European transport infrastructure network is considered as the lifeblood of European trade and society, but

this network is composed of many existing infrastructures that no longer fulfill the functional requirements and today's safety and quality standards expected today, and requires refurbishment and increased capacities: it indeed deserves a revisited approach towards deep integration of innovative technologies, systems and knowledge!

The **REFINET** European Coordination action (GA 653789, supported by the European Commission under the H2020 programme) is an instrument aiming at increasing the pace of future

development and delivery of innovative design, construction, maintenance and upgrading concepts and solutions that promote and strengthen seamless transport links for passenger and freight, while keeping up with future technological trends.

As a project supporting the *Infrastructure & Mobility Committee* of the ECTP, its primary objective is to create a shared European vision of how the multimodal European transport infrastructure network of the future should be specified, designed, built, renovated, and maintained, and elaborate a Strategic Implementation Plan (SIP) that will define the innovation activities required to make this vision a reality.

Such an ambition must be supported by a sustainable research network that integrates relevant stakeholders' representatives of all transport modes (road, railway, maritime, fluvial...) and transport infrastructure sectors, and is a major cornerstone of an ambitious initiative to be further supported by the European Union, facilitating the development and time to market of affordable breakthrough technologies and solutions for high-level service infrastructures supporting future Transport Services.

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Initiation of REFINET CSA under the scope of ECTP Infrastructure & Mobility (reFINE)

The REFINET CSA was inspired following the same concept that has led the activities carried out in the transport area of ECTP-REFINE since its inception in 2009. At ECTP we think construction and O&M are transversal to the different niches or silos represented by the various transport modes (rail, road, water, air, etc.) and therefore we can play an integrative role in bringing together and consolidating ideas from the independent mode ETPs and related organizations, grouping the commonalities and identifying the interfaces between them (cross modal) as well as respecting specificities that pertain only to each one of the transport modes.

To achieve this goal, the REFINET CSA is supported by a consortium of companies, technology

platforms and research centers qualified in this area of expertise and with the aim of creating a large network of stakeholders encompassing all transport actors across all modes.

The CSA is right now building up the network of stakeholders and identifying the experts to participate, by invitation, in the different workshops that will take place throughout the REFINET project. We look forward to meet you in one of our meetings if you happen to be one of them!

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Information on WP3 progress



The WP3 led by TECNALIA, will ensure the achievement of

the project Objective “2) Defining the REFINET vision”. Consequently, the main objective of this WP is imagining how should be the multimodal European transport infrastructure network of the future and the R&I demands to evolve the current European transport networks according to this vision.

In order to achieve this objective, REFINET Consortium is working now on Task 3.1 “Definition of the REFINET multi-modal transport infrastructure (RMMTI) model” (from July 2015 to January 2016) with the aim of defining the REFINET multi-modal transport infrastructure (RMMTI) model, which will be the reference for the future evolution of the European transport infrastructure.

In this first task, the different documents issued by different Technology Platforms, transport sectorial associations, European Commission and National governments are being analysed in order to integrate their partial approaches (by transport mode, technical aspects, business models...) in 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 infrastructures’ managers 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 will be selected.

In this task, the definition of this model will not only be undertaken by the REFINET’s partners, but also by the members of the REFINET network, who will contribute to the discussion through workshops and reviews of the proposed model. Several workshops are envisaged, in order to analyse the technological demands of the new transport infrastructures as well as the existing transport infrastructures. The first workshop will be held in Madrid the next 2nd December.

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REFINET COMMUNITY

Innovation activities in transport infrastructures from ARUP



As one of the founding members of the European Construction Technology Platform (ECTP), Arup have been active for many years in shaping the development of a roadmap and vision for future European transport infrastructure networks and are proud members of the REFINET project consortium. Here there are a few examples of Arup’s work in this area.

Exploring future trends

The **Future of Highways** and **Future of Railways** reports highlighted how pollution, population increase, congestion and changing weather patterns are putting pressure on transport networks. In response, many cities are choosing to get smarter about mobility.

The reports highlight how different technologies – such as e-payments for tolls, buses and trains as well as smart technologies for asset condition and performance monitoring – can benefit passengers and operators alike.

An internal study involving interviews with over 40 people globally representing different disciplines within Arup explored opportunities to enhance **urban mobility**, with the top 10 opportunities identified below.



1. Enabling shared mobility services
2. Implementing incentives and pricing solutions
3. Improving logistics systems in urban areas
4. Supporting shift to active mobility
5. Reducing car dependency
6. Developing autonomous mobility
7. Integrating urban design and transport planning
8. Optimising big data and data analytics
9. Developing connected and networked mobility
10. Implementing 'last mile' solutions

Smart mobility: transforming urban transport

Imagine your phone telling you to stay in bed because the traffic is terrible, or that the quickest way to get to work today is to hop on your bike. This is smart mobility in action, and one example of the power of intelligent transport systems (ITS). The **oneTRANSPORT** project, where Arup are leading transport consulting aspects of the project, is making this a reality. An open-source ITS platform is being developed that shares transport data using internet-of-things technology. It will help expert developers and analytics communities create new public information services and tools that make getting around easier.

Smart infrastructure and construction

Through collaboration with the **Cambridge Centre for Smart Infrastructure and Construction (CSIC)** based at University of Cambridge, together with other industry partners including **Crossrail Ltd**, Arup has been involved in a number of projects involving the application of novel sensing technologies (fibre optics, photogrammetry, digital image correlation and wireless networks) and in developing whole-life costing assessments.

The innovative projects have led to vast improvements in instrumentation and monitoring system efficiencies, and have led to the publishing of best practices for storage of construction process data and investigating ways of integrating this with Building Information Management (BIM) systems and other approaches under development by Arup. This applied research is contributing to Arup's thought leadership on how real-time back analysis can be routinely incorporated into design calculations using an observational method.

Planning for future infrastructure

On behalf of our client **HS2 Ltd**, Arup is bringing its innovative approach to the design of new high speed rail infrastructure and enabling effective stakeholder engagement as part of the planning process. Utilising our ground-breaking **SoundLab** technologies, Arup has been able to compare the sound of proposed new HS2 trains with European high speed trains, with and without noise mitigation.

Other collaborations such as with the University of Oxford-based **Infrastructure Transitions Research Consortium (ITRC)** are helping to provide data and modelling tools to support long-term infrastructure planning and investment, enabling planners to view the transport system in the wider systems of energy, water and waste at a national scale. The next steps in Arup's research will be to join this national view with our research on city-scale modelling to inform decisions on city planning to enable regional economic growth.

Arup's expertise in **Realtime Synthetic Environments** simulations allow users to explore designs before they are built, giving an accurate preview of a project and allowing stakeholders to understand an environment before it becomes a reality. Users navigate through models freely, without the limitation of a pre-set path or video sequence. Their behaviour is captured and fed back to the design team. By effectively enabling post-occupancy evaluation before construction even begins, Realtime Synthetic Environments not only helps avoid misunderstanding or design errors, it also helps clients gain confidence that the proposed design meets their requirements and facilitates radical design innovation. Recently Realtime Synthetic Environments was used to

support Hong Kong's MTR Corporation in the expansion of a one million passenger a day station. In addition to extensive engineering services, Arup developed the synthetic environment and conducted a wayfinding user study involving hundreds of participants. The results were fed back into the design of the station and led to changes in a staggering 25% of the design.



Links

- CSIC:
<http://www-smartinfrastucture.eng.cam.ac.uk/>
- Future of Rail:
http://www.arup.com/Homepage_Future_of_Rail.aspx
- Future of Highways:
http://www.arup.com/Future_of_Highways.aspx
- ITRC:
<http://www.itrc.org.uk/>
- oneTRANSPORT:
http://www.arup.com/Smart_Mobility?sc_lang=en-GB
- SoundLab:
http://video.arup.com/?v=1_3tllt6dh

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Innovation activities in transport infrastructures from D'APPOLONIA



As a member of the REFINET community, D'Appolonia S.p.A., part of the RINA Group, is the largest fully independent Italian firm providing consulting & engineering services to Clients belonging both to the public and the private sector. The company operates in the markets of Energy, Transport and Infrastructures,

Industry and Investor Support, providing a wide range of services covering the whole project life cycle from feasibility and specialized technical studies to conceptual and detailed design, prototyping and testing, project management, site engineering as well as operation and maintenance management.

Innovation is a prime mover in D'Appolonia evolution. We practice research and innovation to build our future knowledge assets while opening new market opportunities.

As a key market for the company, Transport and Infrastructures is a sector in which research and innovation help us in strategically evolving our offering in response to the changing needs of our customers and the community. Our priorities in this field are in the following focus areas:

- Transformation of the infrastructure to address safety, connectivity, and energy efficiency
- Transformation of the infrastructure to accommodate modal shifts and multi-modal uses
- Evolution of scenarios towards optimized solutions for urban mobility and logistics
- Evolution of Asset Management systems and tools to ensure business continuity, taking into account current and incoming threats as well as the impact of climate change
- Life-cycle risk-based analysis and development of tools moving from risk engineering to risk transfer within an all-hazards approach
- Intelligent monitoring systems including for Structural Health Monitoring (SHM)
- Introduction of smart structures and systems in order to move towards a reactive infrastructure
- Transport Infrastructure Information Modelling (TIIM) adapting the concept of BIM to infrastructure networks

In line with our priorities, we are actively involved in the REFINET CSA, leading activities for the deployment of the Strategic Implementation Plan aimed at rethinking future infrastructures networks.

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COORDINATION WITH PROJECTS & NETWORKS

Joint collaboration with FOX and USE-iT CSAs



Due to the need to strengthen the cooperation between stakeholders in all transport modes, the REFINET Consortium has agreed to work together with the consortia of two related projects, FOX and USE-iT led by REFINET project member, FEHRL (see <http://www.useitandfoxprojects.eu/>). These projects share the same field of research and exploitation; respond to similar stakeholders while at the same time working on different issues. Of particular importance to these projects is the opportunity such cooperation gives in disseminating project results to a wide community of stakeholders.

Some areas of cooperation already identified are as follows:

- joint events over 2016 and 2017 (e.g. special session at TRA2016 in Warsaw),
- potential common publications signed by the three projects in newspapers and journals
- joint templates for best practices and
- templates for collecting names of stakeholders

Based on the identification of synergies by each project, common targeted dissemination strategies will be identified, and in a second step, a coordinated approach for the deployment of those common strategies will be devised. A careful study of the timelines of the three projects is on-going to better identify the potential for joint WP meetings and consortium meetings.

The proposed approach consists of organising quarterly teleconferences between the Coordinators and WP leaders of Communication of the three projects. Besides this managerial coordination, the REFINET WP3 tasks leaders were invited to the FOX/USE-iT technical meeting in October 2015 in order to work on the common template for case-studies. FOX and USE-iT related leaders will be invited to the SIP workshop in

Madrid on 2nd December 2015. Further meetings involving corresponding experts from the three projects may be organised.

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Workshop with REFINET partners and experts from NTPs (October 21st, 2015)

A workshop was organized by PTEC in October 21st, 2015, by WebEx, with other two REFINET partners (Dragados and Tecnalia) and 14 experts from 7 countries that were contacted through the National Construction Technology Platforms NTPs.

In this workshop, PTEC introduced REFINET and REFINET network, Dragados presented the background on the Infrastructure & Mobility initiative (previous reFINE) at ECTP and Tecnalia presented the preliminary work on REFINET Vision and Strategic Implementation Plan

During the debate, there were interventions from the speakers and from several participants with these comments:

- REFINET should prepare documents on cross-modal transport infrastructures
- The strategic lobby at EC, EP, etc. is crucial and it should be mainly done by ECTP through the Infrastructures & Mobility Committee.
- NTPs network should play a crucial role connecting and integrating Member States views
- It is considered that REFINET scope is too large and a systematic approach will be needed considering technical items, potential markets, etc.
- The cross modal approach is considered as a difficult task in some technical areas.
- New approaches are needed to put in practice the interconnection between existing networks of different transport modes and some innovation is still needed
- The Roadmap for Cross-modal Transport Infrastructure Innovation, published in 2013, is considered a good starting point but complemented with information from transport modal TPs and from ECTP/reFINE.
- As an example, it was mentioned that when defining KPIs on capacity of a network, they have to be established considering the complete

network capacity of the different transport modes available in a region

The next workshop will be organized in March 8th, 2016 to present and comment REFINET multimodal transport infrastructure model RMMTI.

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NEWS

Transport Research Arena (TRA2016), 18-21 April 2016 in Warsaw. Registration is now open



TRA2016 (Transport Research Arena) will take place on 18-21 April 2016 in Warsaw. The TRA is the most important European conference on transport research, focusing on all of the research fields of the transport system. The conference's topics

address the main challenges in transport and mobility of people and goods, with respect to energy, environment, safety and security and the economy issues. Results of the latest research on: road, rail, waterborne, cross-modal transport and airports will be presented and discussed on the Arena.

The topics of the conference are:

- Environment – Decarbonisation, Sustainability and Energy Efficiency
- Vehicles & Vessels Technologies, Design and Production
- Urban and Long-Distance People Mobility - Systems and Services
- Urban and Long-Distance Freight Transport and Logistics
- Safe, Secure and Resilient Transport Systems
- Transport Infrastructure
- Human Factors, Socio-Economics and Foresights
- Automation and Connectivity
- Enabling Environment for Innovation

Implementation

Check the latest news, general information and register at: www.traconference.eu

(Source ECTP)

Registrations open for 2015 CEF Transport Info Day



Registrations are now officially open for the 2015 Connecting Europe Facility (CEF) Transport Info Day which will be held on Monday 30

November 2015 in the European Commission Charlemagne building in Brussels (Belgium).

The purpose of this event is to provide information to current and prospective beneficiaries on the 2015 CEF Transport Calls ahead of the submission deadline to ensure a large number of high-quality project proposals are received. The event, which will last the entire day, will also be broadcast live over the Internet for those unable to attend in person.

Registrations are only possible through INEA's website with a final date to submit them set on Wednesday 25 November 2015.

<https://ec.europa.eu/inea/en/news-events/events/2015-cef-transport-info-day>

(Source INEA)

Presentations from H2020 Transport info day online

All presentations from the Info Day on the 2016-2017 Horizon 2020 Work programme 'Smart, green and integrated transport' on 5 November 2015 are available on the event website

<http://ec.europa.eu/research/index.cfm?pg=events&eventcode=D7185674-DE6C-2C3A-6BFC1426216A4F51>

You can also watch the entire event online <https://scic.ec.europa.eu/streaming/horizon-2020-smart-green-and-integrated-transport-infoday>

The event targeted potential applicants to the calls for project proposals under the Horizon 2020 challenge 'Smart, green and integrated transport'. Presentations covered the Work Programme for 2016-2017 and the application procedure, as well as gave detailed information on the calls. A brokerage event in the field of transport research took place in the second part of the day.

Follow #H2020TransportInfo for networking and partner search!

(Source INEA)

Still time to register for TRIP's free stakeholder workshop

TRIP is organising a one-day stakeholder workshop aimed at senior researchers and consultants, policy makers, city planners and other stakeholders with an interest in the future of urban mobility. The event will take place in Brussels on Tuesday 17 November 2015.

Attendees will learn about the progress in Urban Mobility research, how the results can be used to guide future urban developments and have the opportunity to influence recommendations for future policy development.

The TRIP team has been performing a high-level review of projects registered in TRIP under the theme of Urban Mobility. The objectives of the workshop are to:

- Present the results of the review of urban mobility projects in TRIP
- Discuss and validate the conclusions and recommendations regarding the direction of the research and its relationship with EU policy
- Obtain conclusions from the workshop to assist in the generation of a brochure on research in the field of Urban Mobility, which will subsequently be made available through the TRIP portal.

This event will be held at the Sofitel Brussels Le Louise, 40 Avenue de la Toison d'Or, 1050 Brussels, Belgium. The workshop will start at 10:30 hrs with sign-in open from 10:00 hrs and finish at approximately 17:00 hrs. The event will be free to attend and lunch and refreshments will

be provided, however, you will need to make your own travel arrangements.

If you would like to attend, please complete the registration form available at:

<http://ee.ricardo.com/cms/assets/-Project-files/TRIP-April-2015/Registration-Form.doc> and return it to transport-research@ricardo.com

Final confirmation details will be sent approximately one week before the event. In addition, and to give delegates time to study the report, registered delegates will receive the results of the review of urban mobility projects in TRIP in advance of the workshop.

(Source TRIP)

INFRAVATION projects are published



At their last meeting in Brussels on 15-16th April 2015, the ERA-Net Plus Infraction Steering

Group agreed on the list of full proposals which had been selected for negotiation and funding. This selection list had arisen from the ranking list resulting from the peer-review of independent international experts.

The negotiations of all the grant agreements of these proposals have been concluded throughout the summer and have led to the following 9 projects, which are currently in their launch phase:

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

In November 12-13th, Infracation kick-off meeting was carried out in Brussels with the participation of the Steering Committee members, the coordinators of the nine projects and the Scientific Panel (SP) members.

SP is formed by six experts, coordinated by FEHRL, with the role of having a follow-up of the technical developments in these projects and of contributing to the collaboration between them.



The first day of this two-days meeting included presentations from EC, Infracation Steering Committee members, Encord and FHWA. The second day included detailed presentations from the projects and a meeting between SP experts and project coordinators. The presentations are available at:

http://www.fehrl.org/index.php?m=32&id_directory=7862

(Source INFRAVATION)

ERF and AVTODOR share knowledge on Innovative Technologies for High Speed Roads

On 13 October, ERF and AVTODOR (Russian Highways) organised a half day seminar whose aim was to exchange knowhow on new technologies and explore the appropriate legal frameworks that could enable a greater uptake of innovative solutions in the road sector.

This technical conference was held within the context of the DOROGA Expo which represents

the main annual event for the road infrastructure industry in Russia, gathering more than 5000 participants. The event was officially opened by the Minister of Transport Maksim Sokolov together with AVTODOR Chairman Sergei Kelbakh.

In the words of Christophe Nicodème, Director General of the European Union Road Federation, “sharing European knowledge and experiences with AVTODOR experts represent an opportunity to discuss innovative solutions, ensure road infrastructure safety management and deploy smart solutions to improve mobility for citizens in both regions”.



The second edition of the ERF-AVTODOR joint seminar was split into two strategic sessions. The first session was dedicated to the topic of ‘Boosting innovation in road construction and management’ and featured speakers from the EU and the Russian Federation. Given that billions of euros are spent every year on road construction maintenance, public procurement can be powerful tool that can help authorities choose the most cost-effective solutions, provide better incentives for company innovation and, most importantly, provide the best-value for money to taxpayers in terms of road safety.

In this sense, the new Directive 2014/24 at European level definitely represents a step forward given that it seeks to move away from the cheapest price model and encourage authorities to consider other elements such a lifecycle and environmental externalities. For this to become a reality, however, a stronger cooperation between public authorities and industry is needed in order to arrive at a common framework of how the provision of the new Directive should apply to the road sector. In addition to exploring the role of public procurement as a vector for innovation, the session also touched upon other topics such as integrative ITS systems for motorways and how

new technologies can enable road data collection, auditing at high speed.

The second session, held under the title 'Adapting road elements to future challenges', featured a series of presentations by ERF members who showcased innovative developments for road infrastructure elements. In the field of passive safety, the session touched upon the new enhanced role that numerical simulations will have in predicting road safety equipment behaviour, the importance of emergency openings on motorways in case of accidents and how innovative end-terminals can play a double function by also acting as a crash cushion. With respect to active safety, the session featured two presentations on best practice with respect to traffic signs and road safety as well as how new technologies can optimise retro-reflectivity under difficult traffic conditions.

The dedicated joint-seminar, which was attended by around 150 road experts from public administration and industry, was jointly moderated by Igor Urmanov, Member of the Board of State Company Russian Highways, Christophe Nicodème, Director General of the European Union Road Federation and Nikolay Bystrov, Director General of Avtodor - Engineering with a plea to continue the promising technical cooperation in the coming years.

Presentations are available at

<http://www.erf.be/index.php/communication/presentation-releases/471-avtodor-erf-2015-presentations>

(Source European Union Road Federation)