



# REFINET

# **REthinking Future Infrastructures NETworks**

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**Project coordinator** 





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# Partners



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# **1. PRESENTATION**

This is Newsletter No.5 of REFINET, CSA that has been funded by EC within MG 8.1 Mobility for Grow at H2020, where CSTB (coordinator), Arup, D'Appolonia, Dragados, FEHRL, PTEC, Tecnalia and UIC are the partners.

Main REFINET dissemination activities in 2017 included a workshop in Bucharest (March 7<sup>th</sup>) and a conference in Brussels (April 5<sup>th</sup>) within FIRM2017 where a new version of REFINET flyer was distributed.

Besides, REFINET web <u>www.refinet.eu</u> was continuously updated as well as REFINET LinkedIn Group:

https://www.linkedin.com/groups/8464241

This Newsletter includes four sections:

 REFINET progress on R&I priorities in transport infrastructures, by Tecnalia, on Deploying the Strategic Implementation Plan, by D'Appolonia, and on REFINET final conference in Brussels (April 5<sup>th</sup>, 2017), by PTEC.

- Innovation activities on transport infrastructures within **REFINET community**, with a contribution from PTEC, member of REFINET, and with five contributions from experts in REFINET network that participated in REFINET workshop (Bucharest, March 7<sup>th</sup>, 2017), from Bucharest Airports, Milan Airports, Institute of Traffic Transport in Ljubljana, CESTRIN and BCPC.
- Coordination with projects and networks on REFINET at TRB 2017, by CSTB, on REFINET, FOX and USE-iT at FIRM2017, by FEHRL, and on ECTP Infrastructures and Mobility committee, by Dragados.
- News on R&I in transport infrastructures.

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# **2. REFINET PROGRESS**

# 2.1 R&I priorities in transport infrastructures

As in the previous newsletter it was advanced, the **REFINET follow-up in WP 3** will be done until the end of the project **by refining / finetuning** the Strategic Implementation Plan (SIP) with the REFINET network of stakeholders and specifically **the research and innovation topics** in the structured four priorities.

In this sense, **two activities were carried out in the last months** with the aim of refining and sharing the current R&I topics, looking for the involvement of different stakeholders around the priorities of the transport infrastructure.

The first activity was the workshop held in Bucharest in the afternoon session in 7<sup>th</sup> March, where the participants separated in two teams, where asked to contribute in the current list of R&I topics of the transport Infrastructure.

As a main result of this workshop regarding to the research and innovation priorities was the following **priotisation ranking** of the two most selected topics in the four priorities areas:

#### Priority Area A: Urban Mobility:

- Advanced technologies and materials to improve air quality, noise and vibration in cities through smart infrastructure.
- Accessibility for All citizens to all transport modes, taking into account ageing society challenge and the increasing urban demography trend for the daily operation and emergency situations.

#### Priority Area B: Multimodal Hubs:

 Adaptive design. Increase flexibility to interchange route or transport mode adaptable for increasing demand of future population adaptable for climate change events link with other hubs (network of hubs).

 New designs and construction techniques for multimodal hubs in order to optimise the structure repair, maintenance and life extension processes -prefabrication and automatisation processes -use of the underground - vertical designs specially in urban environment.

#### **Priority Area C: Long-Distance corridors:**

- Smart Infrastructures enabling condition based Maintenance. It is important that the sensing and inspection technology as well as the models for degradation and structural integrity are developed in projects combining the two elements. The output of sensing and inspection is input for modelling. Hence, the input data that models require and the information that sensing and inspection can produce must fit. This topic will have wide application for maintenance of large structures.
- Extending the life time of existing infrastructure. New methods and tools for monitoring and assessing (the status of) existing structures, relatively to structural loading and deterioration potential. \* New (non-destructive) testing methods (radar, ultrasound, optical fibre, wireless smart sensors...) for diagnostic, early damage detection and maintenance of the infrastructures; \* Smart inspection and robotics for maintenance \* Integration of terrestrial and satellite systems for the structural health monitoring of key infrastructures located in a natural risk prone area (earthquakes, landslides, floods). Developing alternative structural models for deteriorating structures. The resistance of an ageing structure is dependent on the condition of the materials of which it is composed, for

example the level of degradation of reinforcement bars.

#### Priority Area D: Systemic Approach:

- Coordinated Travel Process Multimodal Information Platforms, developing accurate information systems and integrating predictive urban and long distance traffic models with real-time information and mobility services.
- Integrated information system for asset management to ensure the proper decision-making process, based on sensing, measuring, imaging, simulation and computing tools through the whole life cycle of the transport infrastructure.

And, on the other hand, the second activity was the webinar meeting of *the* network of European Construction National Technology Platforms or similar National organizations, coordinated by PTEC, which was held in March 21<sup>st</sup>, 2017 and where contact persons from Denmark, Germany, Greece, Lithuania, Poland, Portugal, Slovenia, Spain, Sweden and UK participated in this meeting.

Following the main objective of these meetings, which is sharing experiences from the National Platforms, TECNALIA presented the analysis of Research and Innovation priorities on transport infrastructures developed in the frame of REFINET CSA. These priorities have just been distributed through the NTPs network in order to get inputs on the prioritization and on some additional R&I ones.

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# 2.2 Deployment of SIP and workshop in Romania

On 7<sup>th</sup> and 8<sup>th</sup> March 2017 in Bucharest, Romania, REFINET held its second STRATEGIC **IMPLEMENTATION PLAN (SIP) & DEPLOYMENT** OF THE SIP WORKSHOP to continue discussing the future of Transport Infrastructure over a day and a half of high-level exchanges between experts in the field. The workshop was entitled: From short to long-term research & deployment priorities, leveraging the REFINET SIP in Romania and extending it to Eastern *Europe.* This stemmed from the fact that a first workshop had been held in October 2016 to open the dialogue with key REFINET stakeholders on the deployment of the project results including the SIP itself. The deployment strategy continues: Figure 1 shows an overview of its major steps.

#### **Deployment Strategy of REFINET solutions**

A first workshop was held in October 2016 in Rome to present a proposed deployment strategy and discuss it with 24 invited experts. By the end of the discussions, the representatives of the Transport Infrastructure managing authorities of two REFINET case studv countries, Italy and Romania; Austostrade per l'Italia, AISCAT (Italian Association of Toll Motorways and Tunnels and RFI (Italian Railway Operators) Infrastructure Manager) for Italy; CFR S.A. (Romanian Railway Infrastructure Manager) for Romania both confirmed their interest in being actively involved in the next steps of the short-term deployment strategy as well as in providing data and information for the validation of the REFINET Platform. A dialogue between these organisations and REFINET was therefore initiated and a plan for collection of input defined.



# Short Term Actions

#### Rome workshop (26 Oct 2016)

**Participants**: Representatives of TI managers from 2 case study countries (Italia & Romania)

**Output**: Initial discussion on roadmap to taclking immediate needs (use of REFINET Tool)

# Medium Term Actions

# Bucharest workshop (7 March 2017)

**Participants**: Representatives of TI managers and Policy Makers from case study country (Romania) qnd other neighbouring countries

**Output**: finalisation of roadmap on immediate needs (through the REFINET tool); initial discussion on medium to long term roadmap (key deployment & research topics)

### Long Term Actions

# Final SIP Deployment Roadmaps (deliverable 4.2)

**Consulted:** Representatives of TI managers and Policy Makers from Europe (including the case study countries) & EU institutions

**Outputs**: final list of top priority deployment & research topics; recommendations to EC and to Romania on next steps (short, medium & long term)

*Figure 1 SIP deployment* 

A **second workshop** was then held in Bucharest on 7<sup>th</sup> and 8<sup>th</sup> March 2017 with a twofold aim (the proposed agenda of the workshop can be found below):

- present the results of the collaboration with the two case study countries to date and finalise the short-term roadmap approach as illustrated by the Romanian case study
- 2. start exploring the **medium to long-term** roadmap timescale, starting from the Romanian case study, aiming at feeding information to Policy Makers, Public Bodies and Members States Authorities on future research topics.

30 participants from 20 organisations attended the workshop, most of them from Romanian Infrastructure Management authorities and ministries. Representatives of European associations and of other national organisations involved with TI from Slovenia, Italy and Spain were also present. The two days were structured as follows:

#### Morning of day#1:

- Update on the Deployment Strategy for the SIP through Romanian Railway case study and presentation of progress on the REFINET TI-TechMapper (Geo-Clustering) Platform;
- Discussions on the roadmap for deployment of the SIP in Romania – short term perspective: Deploying the SIP to other modes and multimodal TI at a regional, Eastern European dimension and later on at a European dimension.

#### Afternoon of day#1:

- Workshop session: Deployment Strategy Discussion – Identification of Research, Development and Innovation Priorities and Topics in the medium to long term, identifying and analysing technological demands of the new and existing transport infrastructure.
- Debrief and Wrap-up.

*Morning of day#2*: Discuss tangible opportunities for collaboration in the scope of REFINET. A round table of two-hours was organised to continue discussing with representatives of the REFINET network members and end-user community (e.g. stakeholders in the transport sector including Infrastructure Managers, Operators, Transport Solutions Supplier, Local and National Organizations, etc.). Discussions targeted how to better exploit the outcomes of the project and to identity opportunities for collaboration in joint initiatives in the form of Public Private Partnership, European Innovation Partnerships or any other Joint Undertaking (e.g. Structural Funds, CEF, etc.) or H2020 tool to be later proposed to deciding bodies (EC, member states, industry, etc.).

From the proceeding of the workshop, an overall roadmap of deployment for the **REFINET** solutions in the context of European Transport Infrastructure and a more specific roadmap focusing on Romania is being prepared. It will be finalised in a public deliverable at the end of REFINET (April 2017). In parallel, a wider consultation of selected members of the REFINET community is taking place to produce a final list of topics which will be recommended as high priority research and deployment actions to key stakeholders, including the European Transport Technology Platforms, Innovation and Networks Executive Agency (INEA) in charge of the CEF agenda and the European Commission (DG-MOVE primarily).

#### Highlights of the discussions held in Bucharest

#### 1. REFINET Romanian CFR case study

Since the October 2016 Rome workshop the Căile Ferate Române (CFR<sup>1</sup>), the national train operator in Romania serving the 22,247km of

track, has become a central partner for the development of the short-term deployment roadmap of REFINET, consequently setting railway as the first of the four transport modes to be explored as part of the work on the deployment roadmap. D'Appolonia, leader of the activity related to the deployment, has since collected input from CFR which directly fed into the TI-TechMapper Platform of REFINET, thus enabling the development of scenarios to help understand how the Platform can be leveraged by its users. At the Bucharest workshop, CFR represented, continued sharing contributions regarding their expectations of the use of the tool (e.g. priority needs to programmes targeted projects and at European corridors (CEF), the collection of data needs to be extended to other EU countries or neighbouring countries such as Ukraine and Moldova, etc.). During the workshop it was also discussed that AFER, the specialized technical body of the Romanian Ministry of Transports, could be the next Romanian stakeholder involved in sharing information also on the railway case study but from the standard and regulation angle.

2. Opening the REFINET Deployment Case study to other modes:

As explained above, the first transport mode specifically studied as part of the REFINET deployment strategy is rail in the Romania context. At the Bucharest workshop participants, coming from all transport modes, discussed the rationale behind opening the study to other modes of transport or to multimodal TI, first at a regional, Eastern European dimension and later on to a European dimension. In that context, the Representative of the Ministry of Transport expressed his interest in promoting the tool at events organised by the Ministry to the various

<sup>&</sup>lt;sup>1</sup> <u>http://www.cfrcalatori.ro/</u>

operators to showcase the REFINET Platform. Participants from Bucharest airport on the other hand explained that they are involved in discussion regarding multimodal access to the airport which has already lasted for many years due to change in political support, lack of difficulties authorisation and with expropriation issues. Their input into the Platform could be very relevant but may be given at a later stage. On behalf of Romanian Waterways BCPC explained that for it to be useful to them the tool must include past projects and information about future calls to enable improvements of navigation on the Danube and the missing link between Bucharest and the Danube. The benefits of using waterways versus other modes should also be emphasised. Finally, participants floated the idea that joint procurement as way to structure R&I activities could be included to the Platform to enable transnational collaboration between TI policy makers or managers. An example of joint procurement between Slovenia and other South Eastern European partners was given by the participant from Slovenia, Prometni Institute<sup>2</sup>. Participants suggested that information regarding the current pre-commercial procurement programme of the European Commission – which supports the transfer and adaptation of innovative solutions - could be added to the Platform.

3. Workshop session: Deployment Strategy Discussion – Identification of Research, Development and Innovation Priorities and Topics in the medium to long term

In parallel to the short-term roadmap for the deployment of the REFINET SIP, a medium to long-term approach (from 8 to 20 years) is being developed to relay information to Policy Makers and Public Bodies (including Transport

Authorities) about future strategic research topics in TI based on an analysis of the current existing technology offer and the future demands. To achieve this result, the REFINET "research needs" matrix has been developed to collect information in order to help prioritise investments in R&D in three Transport Network Pillars – i.e. urban mobility, multimodal hubs and long-distance corridors – and in a fourth systemic dimension transversal to the whole TI sector. The matrix filters priorities by TRL levels and gives for each of them critical information on scope, impact, costs, timeline, scale and any further comments which can help a user in prioritising.

To prepare for the workshop the matrix was circulated to all participants a week ahead. At the workshop itself participants were split into two groups; each group worked on two of these pillars to discuss the proposed topics, identify any missing topics in an effort to help refine the final short list which is to be used as part of the long-term roadmap for the deployment of the REFINET SIP. Participants were also asked to select their top three priority topics for immediate lobbying with the relevant institutions to ensure these topics are integrated into either the final H2020 research & development work programme or in the first work programme of FP9.

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### 2.3 REFINET final conference

REFINET presented its main results during FIRM2017 (Brussels, April 5<sup>th</sup>, 2017) with about 80-100 participants.

<sup>&</sup>lt;sup>2</sup> <u>http://www.prometni-institut.si/</u>

Jesús Rodríguez, PTEC Managing Director and REFINET coordinator of dissemination and communication, opened the session and made some comments on R&I initiatives in transport infrastructures before REFINET and the expected actions after REFINET through ECTP Infrastructure and Mobility committee.

Alain Zarli from CSTB and REFINET coordinator presented the multi-modal transport infrastructures approach developed within this CSA. Savina Carluccio from ARUP summarized the best practices in transport infrastructures and the available technologies with different TRL values.

Research and innovation priorities for multimodal transport infrastructures have been identified in REFINET with the coordination of Jesús Isoird and Jon Aurtenetxe from Tecnalia and were also presented by Alain Zarli in this session. It was pointed out that these R&I priorities will be complemented with expected contributions from National Construction coming Technology Platforms.

Clemente Fuggini from D'Appolonia presented the recommendations for mobilizing R&I programs in transport infrastructures and a geo-cluster platform, with some conclusions on the lesson learnt from a case study (Railways in Romania). The Platform is available at:

http://www.dappoloniainnovation.com/refinet/default/user/login

Finally, after some minutes of debate, Miguel Segarra from Dragados and chairman of ECTP Infrastructure and Mobility committee made the closing remarks highlighting the need to continue the work of REFINE within ECTP in collaboration with other European Technology Platforms.

A new version of REFINET flyer as distributed at this conference that included a summary of REFINET main results.

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Figure 2 Participants and speakers in REFINET final conference

# **3. REFINET COMMUNITY**

### **3.1 Spanish Construction Technology** Platform, PTEC

The Spanish Construction Technology Platform PTEC (<u>www.plataformaptec.es</u>) is one of the members in **REFINET** CSA, acting as dissemination manager.

PTEC has the objective of contributing to the improvement of the construction sector through public-private partnerships in research and innovation carried out among enterprises, industrial associations, universities, research centres and customers.

It was created in 2004, initially promoted by the main Spanish construction enterprises, as a mirror of the recently created European Construction Technology Platform ECTP.

PTEC was constituted as Foundation FPTEC in 2010 and, today, has about 90 entities as members. The **Steering Committee** is PTEC's management core body, which meets three times a year.

PTEC has **Working Groups** that are in charge of the definition and development of the activities, in collaboration with the Managing Director and the Secretariat, and their role is to promote initiatives that facilitate the participation of the PTEC members in research and innovation proposals, at both national and international levels.

There are five Working Groups:

 Two strategic Working Groups on Internationalization of research and innovation and on Promotion of innovation • Three thematic Working Groups on Transport Infrastructures, City of the Future and Construction Processes. The first one has been following up the work of PTEC at REFINET CSA.

PTEC redefined its strategy at the beginning of 2013, and is based on three main pillars:

- The internationalization of its members on research and innovation
- The promotion of innovation
- The improvement of the image in the Construction Sector through R&I

PTEC organizes **Open Conferences** attended by 120-150 participants in order to promote interaction between Public Authorities and interested organizations on R&I in the Construction Sector. These Conferences are held two times a year in different geographical areas in Spain.



Figure 3. PTEC conference in Barcelona



Figure 4 PTEC conference in Seville. Posters session

A conference was organised in Barcelona, in April 2016, on the innovation in the maintenance and the upgrading of transport infrastructures. Other one was organized in Seville, in November 2016, on the innovation in the construction processes covering subjects as 3D printing, modified processes for maximum material recycling, use of drones, virtual and augmented reality, etc. The next conference will be organised in Valladolid, in May 2017, on the innovation in the construction sector to contribute to the decarbonisation of the city.

PTEC also organizes Workshops on research and development related items for the members of this Platform. These Workshops are held by groups smaller than the conferences in order to facilitate the debate and allow for the exchange of information among participants. The last one was organised in February 2017 on the digital transformation: toward construction 4.0 and a previous one dealt with the technical evaluation and the insurance of the innovation.

PTEC prepares **documents** that refer to different research and innovation subjects in the Sector. The aim is to provide the members support for their daily activities. Examples of that are the following documents:

- Opportunities for the Sector's research and development in the different national and international programs.
- The promotion of the innovation through items related to the technical evaluation, the protection and the insurance of the innovation.
- Improvement opportunities in construction processes as tunnel excavations, rehabilitation of building' facades, etc.

Finally, PTEC coordinates the **National Construction Technology Platforms network** with contacts in 15 - 20 European countries, working together with the European Construction Technology Platform ECTP and EC, editing e-newsletters and organizing meetings and other contacts in order to make European construction innovation stronger.

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# 3.2 Bucharest Airports National Company

#### A brief history

Bucharest Airports National Company operates the airports of the Capital, Bucharest

Henri Coandă International Airport and Bucharest Băneasa Aurel Vlaicu International Airport, which merged in 2010 and process over 70% of the passenger air traffic in Romania.

The company's goal is to develop a modern and efficient regional airports system in the South-Eastern part of Europe. We have the mission to ensure a fluent passenger and cargo traffic by being a trustworthy partner for all our customers: passengers, airlines, handling companies and all other operators connected with our business, by promoting the highest standards of the provided services, protecting the environment and maintaining a high level of social responsibility.

Over the years, Henri Coanda Bucharest International Airport passed through different changes. Between 1940-1964, it functioned as an air military base.

In 1965, the process for transforming Otopeni military air base into Bucharest-Otopeni International Airport gets the green light. The works were focused mainly on the modernization of the main runway which allows landing of higher capacity aircraft.



#### Figure 5 The after crisis (2009 – 2011) recovery trend in pax growth.

After 20 years, the airport is undergoing a new development stage. The second runway (3500m) and the corresponding taxiways system have been built. The operational capacity increases to 35 aircraft movements/hour. The ILS is modernized.

In December 1997, the International Departures Terminal was inaugurated, with a capacity of 1200 passengers/peak hour. The boarding hall was equipped with five airbridges.

On the 29<sup>th</sup> of March 2011 The new terminal ("Finger Terminal") was inaugurated. It was designed to meet the Schengen standards. The new facility has an area of 16.600 sq. m. The passengers enjoy a superior level of service, sustained by a state-of-art technology and integrated within a modern and in trend design.

By the extension of the Schengen and International Departures Terminal in 2012, the airport has doubled its capacity with a total new area of 19.600 sq. m.



Figure 6 Bucharest airport

#### **Evolution of passenger traffic growth**

In 2016, Bucharest Airports National Company has handled close to 11 mil passengers and 120 700 aircraft movements.

In 2016, the number of passengers that passed through the airports recorded a substantial increase of 18.31% compared to 2015. The evolution of passengers recorded within the two airports of Bucharest exceeded the general trend in Europe, as well as the number of aircraft movements. In 2016, 85% of the Henri Coandă Airport have been O/D passengers.

#### Airport Infrastructure Development Strategic Program

Program timeline: 2007 – 2024:

Phase I: March 1st, 2007 – September 1st, 2012 - Approval of the Regional Urban Plan.

Phase II: March 1st, 2007 – December 31st, 2020 – Preliminary documentation, land acquisition, final approvals for objectives from Airport Infrastructure Development Strategic Program. Phase III: January 1st, 2018 - 2024 Airport Infrastructure Development Strategic Program implementation. The main objectives of the program are:

- Modular passengers terminal: 2 modules x 1,500 pax/hour/flow with 25 boarding gates;
- Aprons: 56 new parking stands;
- Taxiway system: 266,000 sq. m;
- Car parks (ground and multi-level): 8,000 stands;
- Connection roads between the airside and landside areas: 83,000 sq. m;
- Multimodal cargo platform;
- "High tech" technological Park;
- Ground transport system connections (highway, railway, subway);
- Underground multilevel railway/subway station.

The estimated cost of the program is 900 mil euro, with a first phase of 460 mil euro.

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# 3.3 Società per Azioni Esercizi Aeroportuali (Milano airports)

Società per Azioni Esercizi Aeroportuali S.E.A. is the company that manages the airports of Linate and Malpensa and the core airport activities in support of passenger and cargo aviation. The main activities are the management, development and maintenance of the infrastructures, plants comprising the airports and offering customers of the SEA Group services and activities connected with the arrival and departure of aircraft in addition to airport safety and security services.

SEA activities are also focused on: Non-Aviation business, which includes offering a wide, differentiated range of commercial services to passengers, operators and visitors to Milan's airports; Energy production, the activities carried out by SEA's subsidiary SEA ENERGIA enable the production of electric and thermal energy to be used by the airports.

SEA provides airport coordination and centralized airport services (such as, information system and information to the public-based on data furnished by the airline companies - surveillance and retails services through third-party agreement, etc). All its activities are performed in compliance with the regulations set by the Aviation Control Boards.

SEA is certified UNI EN ISO 14001:2004, ISO 5001:2011, UNI EN ISO 9001:2008, BS OHSAS 18001:2007. It is also accredited ACI Europe Airport Carbon Accreditation at level "3+ - Neutrality" for the reduction of CO2 emissions.

SEA is controlled by the Municipality of Milan which holds 54.8% of its shares, several small public and private shareholders (0,9%), 2i Aeroporti SpA which holds 35,7% of shares, and F2I SGR Spa - Fondi Italiani per le Infrastrutture - the fund management company dedicated to investments in the infrastructure sector (8,6%).



Figure 7 Milano Airport

The geographical and economic position of SEA's airports benefits further from their location on two of the main trans-European transportation routes - TEN-T (Mediterranean and Rhine-Alpine Corridors), facilitating respectively the east-west and north-south movement of people and goods not only inside Europe but also with the Middle and Far East.

The SEA Group airport system comprises:

Milano Malpensa Airport, 48 km from Milan with links to the main cities of Northern Italy and Switzerland by rail (30 minutes from the city centre) and road, including motorways.

Malpensa operates two passenger terminals and a cargo terminal:

- Milano Malpensa 1, with scheduled and charter flights for business and leisure customers to national, international and intercontinental destinations
- Milano Malpensa 2, dedicated to low-cost flights;
- Milano Malpensa Cargo, Italy's number one cargo airport in terms of goods carried, and one of Europe's busiest cargo airports.

Milano Linate, situated around 8 km from Milan, is Europe's closest city airport, with links to urban public transport. It is dedicated to frequent flyer customers on the most popular domestic and EU routes.



Figure 8 Milano airport

Milano Linate Prime, the leading general aviation airport managed by SEAPrime SpA, part of the SEA Group, is Italy's main general aviation airport and is fifth in Europe in terms of movements served. Primarily, dedicated to a business clientele, it offers services and facilities of the utmost quality.

SEA has a great experience in EU funded programmes and European initiatives. Within the TEN-T and CEF Calls, SEA have been involved in several projects concerning the development of the Cargo Area and railway infrastructure accessibility system of Malpensa Airport.

Moreover, SEA is involved in a number of researches, studies and projects concerning Safety/Security, ICT, Energy, Environment and sustainable green mobility. With respect to this latter, SEA is investigating on topics related to electric mobility, e.g., the opportunity to shift its operational vehicle fleet in electric vehicles. Also, SEA is studying the possibility of using the Linate airport also as a city logistics and supports the last mile delivery to Milan by electric commercial vehicles.

Regarding ICT and Energy, SEA participated at four FP7 projects, namely CASCADE, S4ECoB, WATERNOMICS and DREAM, focusing on energy efficiency, renewable energy sources, ICT for Water Resource Management and control of the HVAC system.

Within the EU Framework Programme for Research and Innovation H2020, the projects SEA is currently involved in are: Octave, focused on security issues concerning biometrics and voice authentication for the access management in controlled areas, and Transforming Transport on the optimization of the airport operations, with a focus on the turnaround process.

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# 3.4 Institute of Traffic and Transport Ljubljana

Institute of Traffic and Transport Ljubljana (Prometni institut Ljubljana d.o.o.) is a research organisation founded by Slovenian Railways - national transport operator (passenger and freight) and infrastructure manager. The company represents core research and development part of Slovenian Railways with long term experience (more than 45 years) in research in railway Infrastructure and railway transport. The Institute worked in last years on several R&D projects related to infrastructure development, management and maintenance (national and European projects)

The company specialises in research and development of transport technology, infrastructure, transport economics and law, transport related IT&T as well as in elaboration

of investment documentation. The basic goal of the company is expert, scientific and applied output for strategic decisions, development and implementation within various transport systems. The company is internationally oriented and enters into cooperation with many research organisations and scientific institutions in Slovenia and abroad.



Photo credit: Slovenian Railways Figure 9 Slovenian Railways

Main company's activities are:

- Research projects, studies and analyses related to:
  - transport economics
  - traffic technology
  - transport infrastructure and IT
  - investment documentation in the field of transport
  - environmental impact of transport
- Consultancy and educational activities:
  - consulting and technical assistance on national and international level
  - cooperation with university institutions in Slovenia and abroad with knowledge transfer and preparation of joint projects
  - education services: organisation of seminars, expert meetings and symposiums

 Cooperation with state institutions, research institutions and other expert bodies (e.g. Ministry of infrastructure and transport): expert opinions and reviews of project and spatial planning documentation in the field of railway infrastructure, road infrastructure, public utility infrastructure and health care.

The Institute of Traffic and Transport Ljubljana worked in last years on several EU projects in the field of transport, covering various transport modes, including the following EU programmes: Horizon 2020, SHIFT2RAIL, FP7, Intelligent Energy Europe, Alpine Space, Central Europe, INTERREG, Mediterranean, Danube, ADRION and other.

On the national level the Institute was working on strategic studies and strategies for public passenger transport, rail transport, logistics, development of transport infrastructure, mainly for Ministry of Infrastructure and Slovenian Railways.

New and future strategic projects reflect in future needs, trends and transport sustainability.

The Institute is a part of implementation of European Rail Traffic Management System (ERTMS) on Slovenian railway network.

Another strategic project is rolling stock fleet renewal of national passenger transport operator Slovenian Railways which will improve the quality of transport, energy efficiency and attract new passengers. The Institute of Traffic and Transport has been elaborated strategic and investment studies for rolling stock fleet renewal investment.

One of the most important national transport projects in last years was integration of public passenger transport on national level where the Institute of Traffic and Transport Ljubljana was a technical project leader. In first phase the project offered one single ticket for all passenger transport mode on country level.

The Institute of Traffic and Transport Ljubljana established, with support of the International Union of Railways (UIC), South East Europe Alliance For Rail Strategic Innovation (SEESARI), which goal is clustering of interested transport stakeholders for identifying the innovative projects and needs for railway development and transport and realization of projects bringing new ideas and solutions into reality. This will contribute to development of sustainable transport in South East Europe and within wider European railway system.

The Institute of Traffic and Transport Ljubljana participated at the REFINET workshop in Bucharest and contributed to the REFINET multi-modal priorities' structure also from the railway operator's and infrastructure manager's point of view. The REFINET outcomes will be important for future multimodal European transport infrastructure network.

Participation at the workshop was also excellent opportunity to exchange opinion with stakeholders and good opportunity for new contacts and discussions about new future projects.

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#### **3.5 CESTRIN**

National Roads in Romania are managed by CNAIR (National Company of Romanian Infrastructure Administration). CESTRIN is the technical branch of CNAIR which deals with aims to provide expertise to solve technical operational problems on management and development of motorways and national roads.

Information about CESTRIN:

- Associate Founding Member of the European Forum of Road Research Laboratory (FEHRL);
- Member of Professional Association Roads and Bridges in Romania (APDP).
- Technical cooperation with all universities in the country;
- Collaboration with the Permanent Technical Council for Construction (CTPC);
- Collaboration with design firms, consultancy and execution of road works;
- Studies and surveys, traffic forecasts;
- Managing traffic data at national level from 1955 to present;
- Periodical investigation of the technical condition of the road network in order to prioritize works using specific inventory and analysis programms for roads and bridges;
- Uptake and implementation of advanced traffic technologies;
- Technical assistance to rehabilitate and modernize roads through the CESTRIN laboratories;
- Assessment and issuing technical agreements for new road materials, products and technologies;
- Coordination and development of regulations, standards, technical norms and instructions in accordance with European standards;
- Coordination of informatics activity;
- All CESTRIN activities are monitorized through a quality system ISO 9001.

#### A. Traffic Engineering Department

The Traffic Department within CESTRIN deals with traffic census (every 5 years on the entire

public roads network), traffic forecasts, traffic studies, processing traffic data. To note that CESTRIN, by its Traffic Department, manages all the traffic data collected over the entire public road network since 1956.

Other important activities handled by the Traffic Department is the traffic monitoring using automatic traffic counters (classifier/WIM), determining the structure and evolution of heavy traffic, including its aggressiveness, revisions of road standards.

Figure 10 presents the counters network on the national roads.

The latest national traffic census on all public roads was carried out in 2015.

In terms of development strategy, this is stipulated in the General Transport Master Plan approved by the European Commission.

#### **B.** Roads and Bridges Department

#### <u>Roads</u>

The Pavement Management System is a road administering informational program, which has been implemented in our country since year 1997, through the European Community's PHARE Technical Assistance Program. Currently, through the implementation of this program by CESTRIN to the Company level, Romania is able to align herself to the European Community's standards regarding the national road's management.

#### **Objectives**:

- Investigating and expertizing the Technical State of the road network using the high yield equipments in endowment;
- Quality control over the execution of new roads and over the modernization of the existing ones;
- Perfectioning and extending the implementation of the Pavement Management System to the entire network of national roads;
- Tracking the performances in exploitation of the road pavements and of various applied technologies through:
  - The experimenting program;
  - Technical Expertise of the road rehabilitation or road modernizing projects.



Figure 10 Counters network on the national roads



Figure 11 Roads department endowment

#### **Bridges**

#### **Objectives:**

system;

- Measurements and specific investigations in order to verify the rehabilitation's works on the bridges proposed for reception;
- Technical supervision, monitoring and implementation of projects with external funding;
- Investigation of bridges with specific equipment from endowment;
- Bridge inspection and investigation in accordance with the provisions of Instruction AND no. 522/2006;

Development of the bridge management

- Techno-economic analysis and prioritization of maintenance or rehabilitation works for the bridges analyzed;
- Developing strategies for maintenance of bridges from the Romanian road network;
- Studies and Technical Approvals for products, processes / technologies and equipments used to the bridges and other works of art;
- Nondestructive and semi-destructive investigations with equipment from endowment, for research purpose.

Figure 12 Bridges department endowment

#### C. Laboratory of Roads

#### **Objectives:**

- Studies and laboratory tests for assimilation and implementation of advanced road technologies;
- The quality of materials used in the implementation of the rehabilitation and upgrading of national roads, highways and experimental sectors.
- The quality horizontal and vertical road markings road signs
- All tests that are done in the departments use methods and equipment of European standards in the field.

#### Organization:

- Materials for roads (MD);
- Roads (D);
- Natural aggregates for road works (ANCFD)
- Geotechnical and foundation soil (GTF);
- Traffic Safety (SC)

#### D. Information Tehnology. Informatics office:

#### **Objectives** :

- Design, development, integration systems;
- Database management and exploitation;
- Web Applications for achievement of the company tasks;
- Technical assistance and cooperation with CESTRIN sections;
- Office activities, digitizing, editing and printing road maps.

#### Organization:

- Human database application and web programming
- Hardware Client and Servers units
- Software Microsoft licenced technologies

#### Endowment:

- Microsoft Office
- Visual Studio
- Microsoft SQL Server
- Windows server

# Administration local area network and internet office

**Objectives:** 

- Servers Management: WEB, E-MAIL, AD, Ticket, FTP, Cluster SQL, Register Rovignette (hardware/software)
- Centralised storage system administration
- Internet connection management
- Providing technical support to ensure the proper functionality of computers, equipment's (hardware/software) and telephony equipment's for CESTRIN employees
- Check / systems configuration of mobile and landlines
- Email accounts management
- Visual monitoring of the proper functionality of the air conditioning systems and equipment's in the Data Centre Rovignette
- Active Directory accounts and policies management
- Ensuring the proper functionality of copy, print, scan and fax equipment's

#### **GIS Office**

Objectives:

- Our strategy is based on following licenced software: ArcGIS Desktop Standard 10.4, Data Interoperability Extension and Network Analist Extension.
- Develop and growing geospatial database with specific information

- INSPIRE directive implementation relating to geospatial data publishing concerning national highways viability
- Specific maps making on paper support, also available in electronic format (HTML)
- Developing GIS applications namely for routing and general presentation

#### Organization:

- Human specialised personal on GIS and application programming
- Hardware client and server units
- Dedicated Software ArcGIS for Server, ArcGIS for Desktop

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# 3.6 Bucharest - Danube Inland Waterway - the Romanian IWT System Missing Link

Making a waterway link between Bucharest, the capital of Romania and the Danube waterway has been the subject of concerns over the last decades of the nineteenth century. In the actual European funding policy support for infrastructure projects the Ministry of Transports (CN ACN SA Constanta) anticipate the opportunity to finance and continue the started works of connecting the Bucharest Municipality with the Danube River through a waterway (Va class) with the shipping capacity of more than 24 million tonnes/year. Linking the capital of the country to the main IWT system of the trans-European navigation, will allow direct connection of Bucharest with the capitals and large city centres in Europe: Belgrade, Budapest, Bratislava. Vienna. Frankfurt, Duisburg, Rotterdam.

The complex engineering of the Arges River has been proposed since the late 19th century. The project was conceived and partly implemented with the contribution of several generations of Romanian specialists, as it has been considered a key project for Romania not yet completed.

The building of the canal began in 1986, the project was supposed to have four locks and five hydroelectric plants. In February 1990 the building of the canal was stopped, although it was 60% completed. On the Arges River, the waterway is 73 km long, stretching from the Danube to the bottom sill located upstream the Port of Bucharest – 1 Decembrie. On the Dâmbovita River, the waterway between Glina and Budesti is 31 km long (with two additional locks).



Figure 13 Bucharest-Danube Inland Waterway

#### Some features of the project:

- 5 locks with hidropower units to accomodate the 61m level difference (Bucharest-Danube);
- design convoy are L=106.80 m, B=11.00 (11.40) m, T max=3.00 m; minimum radius = 1000 m; locks length =130m; width=12.5 m; depth on the sill =4.75 m;
- navigation use for flowrates on the Arges river lower than 500 m<sup>3</sup>/s (>discharge with locks and navigation stop);
- container ships 200 TEU capacity / tankers up to 2000 t / passenger ships up to 150 persons / car carriers up to 600 cars / Ro-Ro ships for up to 72 loaded trucks;

#### Waterway completion benefits:

- shipping of goods and passengers on a Va class waterway which may accommodates "Large Rhine ship" with max capacity of 2000 t, currently navigating the Danube and to the Rhine-Main-Danube canal up to a traffic of 24 million tones/year;
- full advantage of new logistic zones and possibly industrial parks/residential developed near the ports;
- green electricity powered by MHC located in each navigation complex by exploiting the difference level of about 13.00m between canal pounds. The 4 hydropower plants (Copaceni, Gostinari, Budesti, Oltenita) have 24 MW installed capacity and the energy produced is 109.75 GWh/year;
- floods risk protection for Arges River region for floods up to 0.1% probability of exceeding; irrigation and water supply via water transport systems in agricultural areas of about 150,000 ha. Vegetables and flowers are already produced in greenhouses;

- fish culture by creating bodies of water (1,250 ha) populated with local fish (sport or industry);
- tourism by integrating the Romanian capital Bucharest (pop. 2,000,000) in the European Danube cruise circuits and new marinas;
- positive ecological impact by generating a green corridor along the Arges River (developing, preserving and protecting the existing forests) and erosion control;

#### Costs & Funding

- reviewed project costs to complete engineering works for navigation and other uses is 870.000.000 euro;
- price per km of new waterway is extremely cost-effective, corresponding to a highway built under difficult geological features;
- new public-private partnerships;
- o private partners;
- o point project Romania European Union;

#### **Conclusions**

- long-term regional development project, with multiple economic and social influences especially by the development of objectives and related activities;
- stimulation and development of shipping, production of green electricity, organic farming, environmental protection and solving pollution issue related to the Arges and Danube rivers;
- a high-capacity transport that is more environmentally sound than the rail transport and far less polluting than the road transport;
- direct access to the sea port of Constanta, and through the Rhin – Main – Danube

Canal, to the European networks of navigation waterways;

- production of renewable electric power in hydroelectric power stations;
- potable water supply for local residential areas and irrigation of farm lands with total surface of up to 150,000 ha;
- fish and wildlife conservation, on a surface of about 1,250 ha;
- development of marinas and touristic areas; recreation benefits for residents and visitors; hub for economic, tourism and recreational activity;

- positive ecological influences on the microclimate (water surface of 4,000 ha in area with rainfall deficit) and assisting with regenerating certain areas south of Bucharest; catalyst for economic growth;
- evolving place of canals from industrial transportation routes to sites of recreation and leisure to change the policy makers' concepts for the early 21st centuries;

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# 4. COORDINATION WITH PROJECTS & NETWORKS

#### 4.1 REFINET at TRB 2017

The REFINET CSA, along with its sister CSAs FOX (GA No. 653631) and USE-iT (GA No. 653670) organized this year 2017 again a common Workshop at the Transport Research Board International conference (TRB2017). The Workshop was about Cross Modal Transport Infrastructure, and has been held on Tuesday January 10, 2017 from 3:30 PM until 5:00 PM at the Washington Convention Center.

After opening remarks and introduction to the session by Thierry Goger (FEHRL), the European Commission (Robert Missen & Maria Cristina Marolda, DG Mobility and Transport, Unit Innovation and Research) insisted on the need for cross modal transport infrastructure development.

This was followed by a presentation from Alain Zarli (CSTB & ECTP) on REFINET and its ongoing achievements on Multi-modal transport infrastructure model, R&I priorities and Strategic Implementation Plan, inviting the audience to further interact with the REFINET Consortium as far as R&I priorities are concerned. Thierry Goger then introduced to the FOX and USE-iT projects, and R&D&I and Best Practices Cross-modal Priorities as well as R&D&I and Best Practices Cross-modal Priorities respectively.

A short discussion further took place, including about next steps to be taken up for achieving more integration between transport and infrastructures in the future, before closing remarks by FEHRL & CSTB. This Workshop was followed by attendees from BAST, CEDR, European Commission, FHWA, NPRA and RWS between other.

Alain Zarli REFINET Coordinator <u>alain.zarli@cstb.fr</u>

# 4.2 REFINET, FOX and USE IT network feature strongly at FIRM17

The three related projects REFINET, FOX and USE IT featured strongly at the recent 2017 FEHRL Infrastructure Research Meeting (FIRM17) held in Brussels, Belgium on 5-7<sup>th</sup> April 2017. Following the REFINET final conference (see related article), the USE-iT project also held its final conference on the same afternoon (Wednesday 5<sup>th</sup> April 2017) with technical recommendations from each of the work carried out in the relevant Work Packages and both events made up Session 3 of the conference.



Figure 14 Some speakers at FIRM 17

REFINET was mentioned at the Opening of this USE-iT conference by Thierry Goger, FEHRL Secretary-General, as well as by him in the introduction to the previous Session 2 (called Strategy view – the need to go beyond the borders of the transport modes) and. On the second day of FIRM17, the International dimension of FOX, USE-iT, REFINET and related project SETRIS was given by Caroline Evans of ARRB, who also related them to the key findings of the 2016 Scanning Tour on Infrastructure Resilience.

Many REFINET project members stayed for the full FIRM17 conference and were able to network with each other and other key European researchers. Miguel Segarra, ECTP Vice-President and Chair of the Infrastructure & Mobility Committee, also featured in Session 1 on the future of the road business – a publicprivate enterprise embracing infrastructure and vehicles.

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# 4.3 ECTP Infrastructure & Mobility Committee: carrying forward the results of REFINET

In this last issue of the REFINET newsletter, it is advisable to recall where we were at the start of the project and where we are today, in the closing act of REFINET at least from the administrative point of view.

The I&M Committee did not exist at the time when it was decided to launch the REFINET proposal and the ECTP itself was immersed in a process of deep transformation to create a more efficient organisation. However, we had been running the REFINE initiative (not the REFINET) long before. For some years, REFINET tried to keep level in the transport area with the other European transport platforms and related sectorial organizations.

At that time, it was clear to us that much more transversal networking work was needed across the transport technology platforms and related organizations, and the idea of launching a CSA that could provide this type of vision for transport developed within the ECTP.

It has not been solely a work of the REFINET partners, but also of hundreds of experts from many different organisations that contributed to the various tasks of the project and that allowed to deliver high quality output from the consortium. This collaborative work beyond the scope of the REFINET partners was one of our key objectives and has been achieved by creating an open network of experts in the different modes of transport. We were aware before the project started that some of the ambitious work scheduled in the project could not be finished in the project scope. Therefore, the intent has always been to continue to further develop the outcomes of REFINET within the I&M Committee of the ECTP in collaboration with the network of experts of the project.

In the duration of the project, the I&M Committee has also been developing additional activities pursuing this underlying idea of horizontal or cross cutting work among organizations. Among the main achievements in this area, the organization by the Committee of a strategic session in the last TRA 2016 in Poland and the unanimous approval by all TRA organizers for having ECTP as a full member of the next Transport Research Arena conference to be held in Vienna in 2018 can be highlighted.

The satisfactory work of the REFINET has led to the proposal of a new coordination and support action (FOR-NET: Forever Open European Nodes and Corridors – Expert Network) with a remarked cross cutting approach among organizations belonging to or representing different transport aspects.

In summary, the I&M Committee will continue the work started in the REFINET CSA and carry on to provide value for the development of the future transport networks and for the maintenance and upgrading of the existing ones. All these progresses will be reported to the members of the I&M Committee in a plenary meeting to be held next June along the ECTP General Assembly.

Miguel Segarra ECTP I&M Committee mjsegarra@dragados.com

### 5. NEWS

# Transport Research Innovation Portal publishes insight to enhance EU transport infrastructure

A new report from the European Commission funded Transport Research Innovation Portal (TRIP) provides unique insight into transport infrastructure research in Europe - identifying areas where further innovation, research and funding could improve economic and social cohesion.

The new <u>Research Theme Analysis Report</u> from TRIP provides a comprehensive review of multimodal transport infrastructure research performed by European businesses, public organisations and academic institutions. It offers a rare snapshot of the current infrastructure research and innovation landscape to help focus policy makers, stakeholders and researchers on areas to improve the accessibility and performance of transport systems across Europe.



Research projects included in the report are drawn from the online Transport Research Innovation Portal (TRIP) - a free to access, European Commission funded portal for EU professionals to share and discuss innovations in transport mobility. Previous outcomes of TRIP's research include comprehensive reports on Urban Mobility and on Cooperative Intelligent Transport Systems (C-ITS) research. Both can be downloaded for free at

#### http://www.transport-research.info/themeanalysis-reports?s=HP-TAR

Reach academics, local authority transport departments, central transport policy makers and businesses throughout the transport sector across Europe by submitting your transport project at <u>http://www.transportresearch.info/</u>

(Source TRIP)

### Nearly €7.5 billion requested for CEF Transport infrastructure projects

The Innovation and Networks Executive Agency (INEA) has received 349 project proposals by the 7 February 2017 deadline for the <u>2016 CEF Transport Calls</u>, requesting nearly €7.5 billion in total EU funding. The total available budget for the call is €1.94 billion. Evaluation of the project proposals with the help of external experts will start in March.

The 2016 CEF Transport Calls closed yesterday, 7 February 2017, at 17:00:00 with INEA receiving 349 proposals under the following calls:

- CEF-Transport-2016 Annual Work Programme – Cohesion envelope
- CEF-Transport-2016 Annual Work Programme – General envelope
- CEF-Transport-2016 Multi-Annual Work Programme – Cohesion envelope
- CEF-Transport-2016 Multi-Annual Work Programme – General envelope

In total, €7.49 billion funding was requested, whereas the available indicative budget for the calls is €1.94 billion. This represents an overall oversubscription rate of 3.86 times the budget available.

(Source INEA)