REthinking Future Infrastructure NETworks

REFINET

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D2.5 | FEHRL

Final strategy plan on consolidation and expansion of REFINET network

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Revision History

Date	Version	Author/Contributor[1]	Revision By[2]	Comments
15.04.2017	v1.0	Thierry Goger, FEHRL	Miglė Paliukaitė (FEHRL)	Draft
25.04.2017	v2.0	Thierry Goger, FEHRL	All partners	Incorporation of partners' comments
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29.06.2017	V4.0	Thierry Goger, FEHRL	Thierry Goger (FEHRL), Miglė Paliukaitė (FEHRL)	Final version submitted to EC/INEA with changes linked to publication on CORDIS (EU emblem, disclaimer).

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[1] Partner, Name Surname
[2] Partner, Name Surname

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Abbreviations

Acronym	Full name
REFINET	REthinking Future Infrastructure NETworks
USE-iT	Users, Safety, Security and Energy in Transport Infrastructure
FOX	Forever Open infrastructure across (X) all transport modes

Definitions

Term	Full name
SIP	Strategic Implementation Plan

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1   Introduction and background

REFINET is a 24-month project under the H2020 topic of MG-8.1b-2014, which aims to create a sustainable network of European and international stakeholder representatives of all transport modes and transport infrastructure sectors. It will also deliver a shared European vision of how to specify, design, build or renovate and maintain the multi-modal European transport infrastructure network of the future, along with innovative processes to enhance the effectiveness of the sector, and elaborate a Strategic Implementation Plan (SIP) with a comprehensive set of prioritised actions.

REFINET considers two complementary scenarios, namely maintenance and the upgrading of existing transport infrastructures, and the development of new transport infrastructures. REFINET contributes to create a European-wide consensus on where to focus efforts to research and innovation to improve the productivity of assets and drastically reduce traffic disruptions of transport flows from inspection, construction and maintenance activities, as well as accommodate increasing/changing traffic demand. Thus, REFINET paves the way to enhanced technology integration and transfer and mass-market development for innovative materials, components, systems and processes supporting the pan-European generalisation of advanced multimodal infrastructures.

It was achieved by strengthening the cooperation between the stakeholders in all transport modes. The consortia of three Coordination and Support Action (CSA) projects (REFINET, FOX and USE-iT) joined forces to make it possible and enhance the performance of multi-modal transport infrastructure. Of particular importance to these projects is the opportunity such cooperation gives in disseminating project results to a wide community of stakeholders.

2   Objectives of the Deliverable D2.5

The WP2 – COMMUNITY NETWORK BUILDING focuses on creating a sustainable community of transport infrastructure stakeholders that will collaborate with the REFINET partners to develop the REFINET Vision (WP3) and its SIP deployment strategy (WP4). This WP started in month 1 and will finish in month 24.

As agreed between the three CSAs, the EC and INEA, the community to be built on cross-modal transport infrastructure reflects the synergy between the cluster of REFINET, FOX and USE-iT. Therefore, all input from the FOX and USE-iT projects has been integrated with the REFINET network, which aims at building a very large community.

WP2 is built around four tasks:
- 2.1: Identification of stakeholders
- 2.2: Set up of the REFINET Group of Experts
- 2.3: Set up of the REFINET Network
- 2.4: Consolidation of the REFINET network

This Deliverable 2.5 (D2.5) embraces the output of task 2.4 (Consolidation of the REFINET Network). The aim of this task is to ensure that the REFINET network consolidates and even after the end of the project, hence supporting the objective of building a transport infrastructure community. This deliverable is very much linked to the D2.3 and D5.5.

As the REFINET Network has reached 838 members, the following section 3 presents the final consortium's strategy plan on consolidation of REFINEt network. This means that no further expansion is forseen: a regular update of the list is nonetheless planned. The strategy developed by the cluster of the three CSAs is based on a three-step approach:
- UNDERSTAND (short-term)
- TRUST (medium-term)
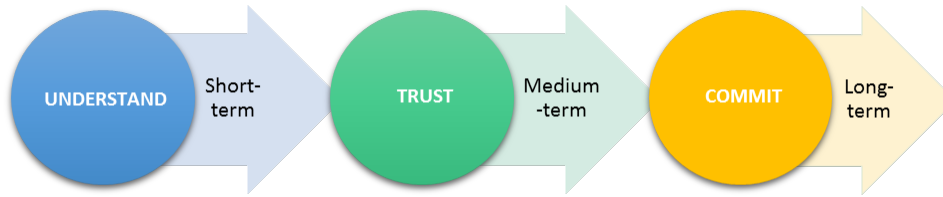- COMMIT (medium to long-term)

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Figure 1. The strategy to foster the "UNDERSTANDING, TRUST and COMMITMENT"

3   Action Plan to consolidate the REFINET network

3.1   Create understanding and trust within the transport infrastructure community

This is the most challenging part of the whole exercise. Indeed, currently the stakeholders are very much separate from each other and work in silos.

The first phase entitled **"UNDERSTAND"**, on which the partners of the three CSAs have devoted most of the effort, consists of generating a common understanding of the various and complex issues related to cross-modal transport infrastructure within the different types of stakeholders from the REFINET network. This step relies mostly on the intense communication and dissemination from the cluster of CSAs. All the activities accomplished and planned within WP5 are the pillar of this phase. The potential for misunderstanding is high, hence the risk of lack of trust and commitment are also high. The project partners will continue paying particular attention to the terminology used, sensitivity around a few political issues and the inclusiveness of all points of view in the dissemination of the projects outputs.

The current REFINET community is very strong 838 stakeholders are already part of the REFINET community or network (see D2.3). The statistics also shows that the current distribution of stakeholders is well balanced in term of geographical distribution, types of stakeholders, modal and cross-modal distribution and international dimension. It was achieved successfully setting up the mechanism to reinforce networking across all transport modes, comprising public and private infrastructure operators, contractors, consultants, research organisations, SMEs and universities.

First of all, the REFINET stakeholders' community was created and later was called REFINET Network. The REFINET network integrated stakeholders from Europe and third countries, as United States, Japan, Middle-East and etc, in order to extend the European knowledge with best practices and technological developments going on in these countries and opening new markets. The project created a multi-disciplinary/multi-sector community, able to answer the key issues related to smarter design, construction and maintenance of transport infrastructures. The main sub-objectives in order to create REFINET network are presented in Fig. 3. (More information in D2.1).

This good achievement comes from the successful cooperation between the partners of the three CSAs and good coordination of the various efforts. It is also worth emphasising that the great achievement of getting the US stakeholders on board results mostly from the workshop organised at Transport Research Board.
The REFINET network helped to deliver a shared European vision of how to specify, design, build or renovate, and maintain the multimodal European transport infrastructure network of the future along with innovative processes so as to enhance the effectiveness of the transport sector.
Nonetheless, REFINET partners contributed a lot to further improve and expand the REFINET community:

- Contacting the representatives of the **TEN-T Network** to include them in the REFINET network
- Liasing with **industrial** contacts to get more industry involvement, especially the Small and medium-sized enterprise (SME) part of the stakeholders
- Liaising with **contractors** in order to get more stakeholders
- Liaising with **user representatives** to increase the number of stakeholders from this category. This activity was done in cooperation with the USE-iT project where the user perspective is dominant.
- Liaising and involving members from the national and European Technology Platforms (ETPs)
- Liaising with contacts **in less represented countries** (where few stakeholders have been provided - e.g. Romania) in order to increase the number of stakeholders from these countries; the partners organised the thematic workshop in Romania
- Stimulating the **international dimension,** in particular via the organisation of three additional major activities (see table 2) in the USA, Asia and Australia.

The second phase known as **"TRUST"** relies on the completion of phase one "UNDERSTAND". This particular phase aims at fostering the exchange and collaboration between the stakeholders of the REFINET network. Indeed, it is only by "experiencing" each other's views, on the basis of a common understanding, that trust can be built. The phase "TRUST" is completed when the stakeholders change their mindset from "competition" to "cooperation".

This step is supported by the overall structure for the communication with the stakeholders and experts and the integration of a REFINET community (see figure 1 below). In this structure, the REFINET network, currently with the assistance of the three consortia, acts as discussion platform which enables input and feedback to be captured from all representatives of the transport sectors who have a stake in cross-modal infrastructure issues. The two main risks envisaged here are:

- Lack of trust in innovative solutions by transport authorities (medium risk);
- Lack of trust between the ETPs of the different modes of transport in the REFINET Vision and SIP (medium risk).

The partners of the three CSAs and the respective Groups of Experts make up a good representation from the main stakeholders involved in the before mentioned risks; namely industry and transport authorities for the first type of risk and members of each of the ETPs for the second one. As a result, the close liaison with each of the respective stakeholders, based on personal contacts, will be continued on a regular basis and play a key role in alleviating the above-mentioned "TRUST" risk in the future of cross-modal transport infrastructure.

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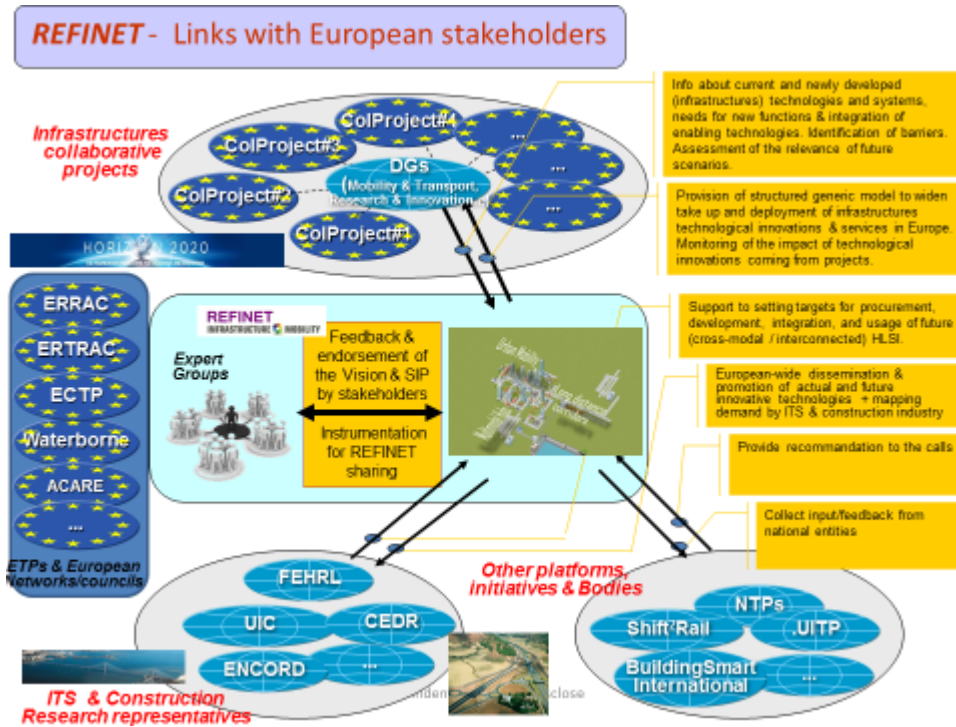*Figure 2: Overall structure for the communication with the stakeholders and experts and the integration of a REFINET Community*

The REFINET network (Fig. 3) helped to deliver a shared European vision of how to specify, design, build or renovate, and maintain the multimodal European transport infrastructure network of the future along with innovative processes so as to enhance the effectiveness of the transport sector.
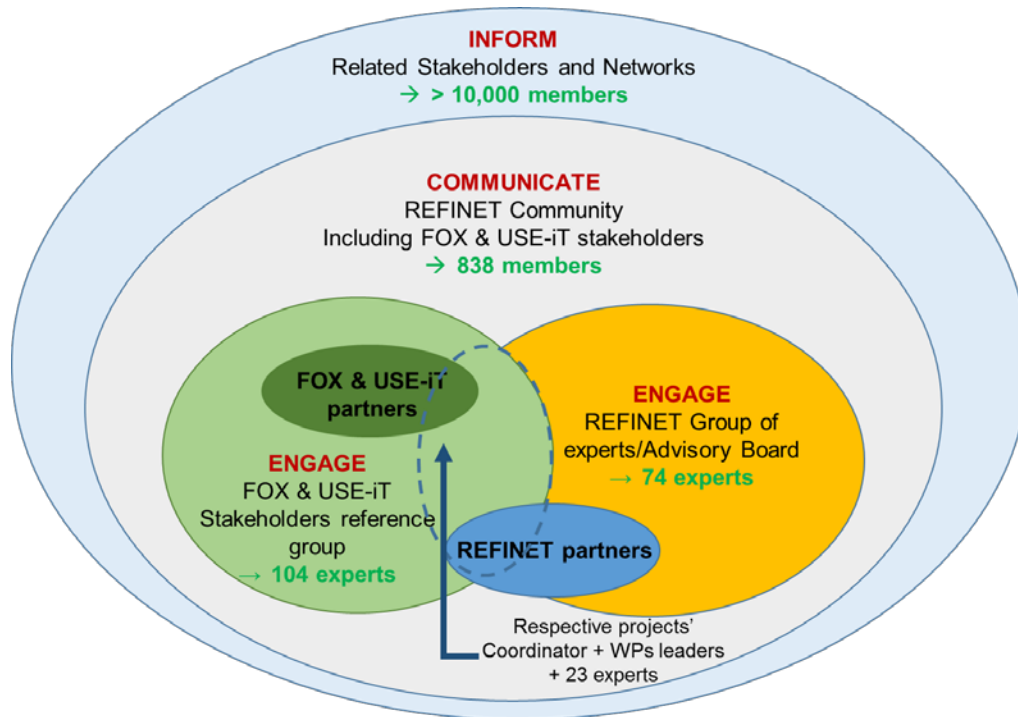
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Figure 3. REFINET Network

Embedded within the REFINET Network, two smaller groups of experts have been established: one for REFINET; one for FOX and USE-iT projects. These two groups represents experts who have a greater interest and influence in the cross-modal issues.

The REFINET Network has been established with a medium to long-term perspective. As a matter of fact, the ECTP will continue to keep alive the data-basis and the community beyond the end of the projects. It is also expected that further activities managed by the ECTP (under the Infrastructure &Mobility Committee) as well as other platforms such as FEHRL and PTEC will carry on updating the vision and SIP throughout their respective think-tank activities. To that purpose, it is expected that the members of the experts group will keep being highly active beyond the end of the projects.

It is also worth mentioning that a few members of the REFINET community as well as partners (FEHRL and ARUP) have been involved in the Strategic Transport Research and Innovation Agenda (STRIA) and it is expected that a few will be involved in the update of this initiative at a later stage.

3.2 To ensure a lively transport infrastructure ready to commit

The third phase called **"COMMIT"** relies on the completion of phase two "TRUST". This step aims at empowering the REFINET community so that the different stakeholders presented in figure 2 above commit to cross-modal R&D&I and the implementation of the REFINET results. This will be ensured through the dissemination and engagement to commit.

The communication and dissemination activities encompasses different types of activities, including a REFINET-FOX-USE-iT item at regular meetings (e.g. ETPs), webinars, conferences, workshops, website, newsletters, etc. Table 1 shows the list of the dissemination acitivties.

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Table 1: *Dissemination activities, events*

Event	Topic	Date	Location
REFINET website		End 2015	
REFINET LINKEDIN GROUP (https://www.linkedin.com/groups/8464241)	Update of REFINET progress	2016	
ECTP, ERTRAC, FEHRL, ETRA, ENCORD plenaries	Update of REFINET progress	2015-2016	Europe
SETRIS consortia meetings	Update of REFINET progress and creation of synergies	2015	Europe
1st REFINET Workshop	Technological demands of transport infrastructures	2nd December 2015	Madrid, Spain
2nd REFINET Workshop	Strategic Implementation Plan Technological demands of transport infrastructures	16th March 2016	London, UK
TRB 2016 Conference-workshop	Cross Modal Transport Infrastructure	13th January 2016	Washington DC, USA
TRA 2016 Conference – Invited session (with FOX and USE-iT), poster, stand (within FEHRL stand)	Increasing the performance of multi-modal transport infrastructure through stakeholder engagement and European-wide shared vision	18th-21st April 2016	Warsaw, Poland
Meeting with Commissioner Violeta Bulc at TRA 2016	Briefing about Cross Modal Transport Infrastructure	18th April 2016	Warsaw, Poland
3rd REFINET workshop	Validate the Strategy for the Deployment of the REFINET Strategic Implementation Plan (SIP)	26th October 2016	Roma, Italy
The 7th ECTP Conference	Main Challenges of the Built Environment faced by the Sector – Transversal Issues	17-18 November 2016	Brussels, Belgium
REFINET stakeholders workshop	REFINET workshop		Melbourne, Australia
Scanning tour	Scanning Tour 2016	23-30 November 2016	South Korea, Japan
Transport Research Board 2017	REFINET, FOX, USE-iT workshop	10th January 2017	Washington DC, USA
4th REFINET workshop	SIP & Development of the SIP workshop#2	7th March 2017	Bucharest, Romania
REFINET final conference	FIRM2017	5th April 2017	Brussels, Belgium

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In addition, as a result of the direct communication and dissemination made by the partners of the three CSAs and the good coordination of the various efforts, REFINET results were also disseminated through other different networks and channels: National Technology Platform networks, FEHRL members, dissemination through the ECTP website, partner websites, other FEHRL channels (e.g. FEHRL social media and publications, FEHRL, FOX, USE-iT websites).

The consultation process with the stakeholders relied mostly on:

- Mass media tools, in particular Twitter and webinar;
- Intensive dissemination of the project results at various events and further exchanges with stakeholders both within and outside Europe.

The consultation process with the Group of Experts relied mostly on:

- The active involvement and contribution of the experts in the thematic workshops.

Globally, the consolation process between the partners of REFINET (as well as FOX and USE-iT) with the REFINET network and the Groups of Experts were expected to (see figure 1):

- Provide information about the current and newly developed (infrastructure) technologies and systems, as well as the needs for new functions and integration of enabling technologies. Identify the barriers and assess the relevance of future scenarios;
- Provide input to the generic model to widen the take-up and deployment of the technological innovations and services for infrastructure in Europe;
- Support the monitoring of the impact of technological innovations coming from projects;
- Support the setting of targets for procurement, development, integration, and usage of future (cross-modal/interconnected);
- Support the Europe-wide dissemination and promotion of actual and future innovative technologies and mapping demand by the ITS and construction industry;
- Provide recommendations to the European Commission and national R&D&I calls;
- Support the collection of input from national entities.

More precisely, the stakeholders and experts involved within:

- REFINET provided input and feedback on a broader scope – from an entrepreneurial point of view – including socio-economic issues (demand, big trends, economic factors) in an innovative holistic approach to serve societal needs;
- FOX focused on physical infrastructure and related technologies common to at least two modes of transport;
- USE-iT – operation of infrastructure and related technologies.

Beside on these aspects, the stakeholders and experts involved in REFINET contributed to the overall vision and its implementation, while the ones involved in FOX and USE-iT focused more on the intermediate step, namely the identification and transferability of cross-modal solutions (technologies, governance, users, and infrastructure).

As a result, the cluster's approach enabled to respond to both calls 2014 – 8.1 & 8.2:

- Call 8.1: "Smarter design, construction and maintenance" aimed at impacting the monitoring and managing of systems; developing new construction & maintenance techniques, extending the life-span of existing transport infrastructure [for all transport modes] in order to support the transition towards zero traffic disruptions and reduce nuisance generated by transport.
- Call 8.2: "Next generation transport infrastructure: resource efficient, smarter and safer" focused on improving infrastructure capacity and incident management by means of added-value mobility services across different modes, hence reducing infrastructure operation energy intensity and subsequent emissions.

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Ultimately, the current development of this collaborative community of stakeholders reinforced the networking among operators with a view to enhancing the effectiveness of the sector, and enabled major benefits in terms of resource consumption, environmental footprint, capacity levels, user satisfaction, which is in line with the EU Strategic Transport Research and Innovation Agenda for 2050.

The communication channel follows the overall structure for the communication with the stakeholders and experts and the integration of a REFINET community (see figure 2). Dissemination activities focus on three sectors that have been identified as especially relevant to assure the expected impact of the project: transport sector, construction sector and ICT (Information and Communication Technologies) sector.

REFINET network will be linked and managed at level of the ECTP Website. CSTB (on behalf of ECTP I&M) will share information to all ECTP members who have raised interest in Infrastructure &Mobility WG. PTEC will share also information to National Technology Platforms (NTPs) members who raised interest in I&M ARUP has planned events (internal & external) to disseminate the REFINET outcomes to U.K. stakeholders. UIC will carry on the discussion within ERRAC plenary meetings and send information to the UIC infrastructure managers group. These future activities are very important in order to foster the "UNDERSTANDING, TRUST, COMMITMENT"of the whole sector about the REFINET Vision and SIP, as well as create synergies with other initiatives funded at European or national levels.

The third phase called "COMMIT" relies on the completion of phase two "TRUST". This step aims at empowering the REFINET community so that the different stakeholders presented commit to cross-modal R&D&I and the implementation of the REFINET results.

An important element of the success of this phase will be the endorsement of the CSA cluster's results by the main stakeholders, in particular the transport authorities and industry. To that purpose, the role of the project partners of the three CSAs and the Group of Experts is crucial and their respective relations with key stakeholders will be exploited.

Likewise, for the "TRUST" phase, the two main risks envisaged here are:
- Lack of commitment in implementing innovative solutions by transport authorities, which has the immediate effect of preventing the development of innovative solutions from the industry since there is no market (medium risk);
- Lack of commitment from the ETPs in exploiting the REFINET Vision and SIP (medium risk).

To reduce the first risk, FEHRL will exploit its MoU with CEDR (Conference of the European Road Directors) in order to increase the commitment of the National Road Authorities (NRAs). Similar liaison from the other members of REFINET, FOX and USE-iT representing the other modes will be also performed. Besides, the EC Directive on Green Procurement will be of further support to alleviate the risk.

The partners will also liaise closely with each of the respective stakeholders from each of the ETPs in order to foster some "COMMITMENT" to the future of the cross-modal transport infrastructure. It is nonetheless clear that there will be no or very little commitment taken during the timeframe of the project. Therefore, the WP2 would recommend establishing a **PPP or a similar initiative** whose role would be to follow up on the exploitation of results from REFINET, FOX and USE-iT in order to support the effective deployment of the R&D&I roadmaps developed by the clusters of CSAs.

The REFINET network will continue to enable stakeholders to network with each other's, and to contribute developing the shared vision on the future of the European transport infrastructure.

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More precisely, the most active part of the REFINET Network, namely the REFINET Group of Experts and the FOX & USE-iT Stakeholders reference group will form the basis for the establishment of the FEHRL FORx4 Group. This group will be in charged to develop the FORx4 programme which should integrate the output from the 3 CSAs (REFINET, FOX and USE-iT), and enhance the work achieved within the 3 projects.

Besides, the work undertaken within REFINET, FOX and USE-iT with the support of the REFINET Network is currently leading to some high-level discussions with the EC about the possible establishment of "Platform for Transport Infrastructure" which could eventually lead to a PPP initiative (like the Green Vehicle initiative for instance).

In addition, further discussion will be held between FEHRL and D'Appolonia in order to possibly integrate the TI-TechMapper Platform into the FEHRL Knowledge Centre. This Platform being mostly empty, the data from the stakeholders will be crucial to be acquired and the information provided will be valuable for them in return.

To sum up, some concrete actions are recommended in order to turn the established network into a self-sustaining platform where members will contribute on a voluntary basis:

- REFINET network will be linked and managed at level of the ECTP Website. CSTB (on behalf of ECTP I&M) will share information to all ECTP members who have raised interest in Infrastructure &Mobility WG. PTEC will share also information to National Technology Platforms (NTPs) members who raised interest in I&M ARUP has planned events (internal & external) to disseminate the REFINET outcomes to U.K. stakeholders. UIC will carry on the discussion within ERRAC plenary meetings and send information to the UIC infrastructure managers group.
- FEHRL will exploit its MoU with CEDR (Conference of the European Road Directors) in order to increase the commitment of the National Road Authorities (NRAs). Similar liaison from the other members of REFINET, FOX and USE-iT representing the other modes will be also performed. Besides, the EC Directive on Green Procurement will be of further support to alleviate the risk.
- The most active part of the REFINET Network, namely the REFINET Group of Experts and the FOX & USE-iT Stakeholders reference group will form the basis for the establishment of the FEHRL FORx4 Group. This group will be in charged to develop the FORx4 programme which should integrate the output from the 3 CSAs (REFINET, FOX and USE-iT), and enhance the work achieved within the 3 projects.
- The work undertaken within REFINET, FOX and USE-iT with the support of the REFINET Network is currently leading to some high-level discussions with the EC about the possible establishment of "Platform for Transport Infrastructure" which could eventually lead to a PPP initiative (like the Green Vehicle initiative for instance).
- Further discussion will be held between FEHRL and D'Appolonia in order to possibly integrate the TI-TechMapper Platform into the FEHRL Knowledge Centre. This Platform being mostly empty, the data from the stakeholders will be crucial to be acquired and the information provided will be valuable for them in return. Liaising and involving members from the national and European Technology Platforms (ETPs).
- Need to develop national programmes (similar to national level) and trans-national programmes (e.g. Infravation but not enough) to leverage the commitment from the Member States.

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4   Conclusion

D2.5 *Final strategy plan on consolidation and expansion of REFINET network* is the last deliverable of the task 2.4. The main efforts of the WP2 partners was focused on:

- The expansion and consolidation of the REFINET network (838 members) by the end of the project, hence supporting the objective of building a transport infrastructure community;
- The consultation with the Group of Experts.

D2.5 completed the strategy to foster the "UNDERSTANDING, TRUST and COMMITMENT" of the REFINET network, including the Groups of Experts which is crucial for the short, medium and long-term success of the cluster initiative.

The strategy to foster the "UNDERSTANDING, TRUST and COMMITMENT"of the whole sector about the REFINET Vision and SIP, as well as create synergies with other initiatives funded at European or national levels, is very much supported by the Communication and Dissemination plan, as well as the Scoping Paper on the cluster's synergies.

The REFINET network will continue to enable stakeholders to network with each other's, and to contribute developing the shared vision on the future of the European transport infrastructure. Specifically, the most active part of the REFINET Network, namely the REFINET Group of Experts and the FOX & USE-iT Stakeholders reference group will form the basis for the establishment of the FEHRL FORx4 Group. This group will be in charged to develop the FORx4 programme which should integrate the output from the 3 CSAs (REFINET, FOX and USE-iT), and enhance the work achieved within the 3 projects.