BONVOYAGE

From Bilbao to Oslo, intermodal mobility solutions, interfaces and applications for people and goods, supported by an innovative communication network

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DELIVERABLE D8.2:

COMMUNICATION AND DISSEMINATION REPORT V2

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Abstract:	This internal report describes dissemination and communication activities carried out during the whole life span of the project.
Keyword List:	Communication, Dissemination, Standardization, Prototypes.

EXECUTIVE SUMMARY

This deliverable D8.2 aims at describing the dissemination and communication activities performed within the whole life time of the project BONVOYAGE. According to the reviewers' mid-term follow up, the deliverable D8.1 has been updated with the inclusion of the Section 3.1 Strategy on Communication and released at month 23 (March 2017).

Then a new deliverable I8.2 presented the updated description of the dissemination and communication activities performed till Month 24. Main and worth modifications and updates are reported in Section 3, 4 and 5, while three new sections have been added: 4.5 "Industrial Events and Stakeholders engagement", and sections 6.1 and 6.2 where the descriptions of the developed demos have been updated according to current status of the research and development activities.

This document D8.2 reports the final update of dissemination and communication activities performed during the whole duration of the project (M1 – M36).

The update of the document keeps the same structure of contents as released in the D8.1 and describes the following main areas:

- Communication channels deployed by BONVOYAGE project addressing different targeted audiences, including collaboration with relevant projects in similar fields;
- Communication activities realised towards different audiences;
- Scientific Dissemination, including conference participations and publications;
- Industrial and stakeholders events;
- Standardization activities realised;
- Open Source prototypes and demos developed.

The BONVOYAGE web site represents the main general public communication channel of the project. Therefore, it is continuously updated with new contents, mainly related to: Research results, Scientific Publications, News about the project progresses and outputs, Tools for involving end users (e.g., the BONVOYAGE Questionnaire I and II). The Web site represents the actual "living report" concerning BONVOYAGE achievements and progresses. Accordingly, the most of contents reported in this Deliverable come from the Web Site.

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1 Introduction

Communication and Dissemination activities are key factor in order to create awareness and impact on European research. The BONVOYAGE's Description of the Action defined an initial plan involving all the partners in communication and dissemination activities, both in the field of scientific dissemination and in the field of industrial communication with the main goal of creating interest around the future project results and pave the way to further deployment of BONVOYAGE's products. The communication toward the general public was also planned considering the impact goals that the project wanted to achieve.

The main goals of this transversal activity are:

- To increase public understanding regarding BONVOYAGE project activities in order to attract interest from different kinds of potential users such as scientific community, industrial sector, and general public;
- To spread information about the benefits of the BONVOYAGE project and its expected results in order to raise awareness about more eco-friendly solutions and encouraging such behaviors;
- To encourage the expression of feedbacks from target groups of end-users (both industrial and private travelers) by letting them to drive and shape the general requirements and technical specification according to their own specific needs;
- To increase the visibility of the BONVOYAGE activities in order to facilitate further collaborations and synergies which can foster new scientific and industrial cooperation on further developments by sharing results and technical achievements.

1.1 Explanation of the deliverable

This deliverable D8.2 aims at describing the dissemination and communication activities performed during the whole implementation of the project BONVOYAGE (M1 – M36).

The document describes the following main areas:

- Communication channels deployed by BONVOYAGE project addressing different targeted audiences, including collaboration with relevant projects in similar fields;
- Communication materials produced during this second half of the project;
- Analytics data about the main on line communication channels;
- Communication activities realised towards different audiences;
- Scientific Dissemination, including conference participation and publications;
- Standardization activities realized;

- Open source software and prototypes realized.

The BONVOYAGE web site represents the main communication channel of the project. Therefore, it is continuously updated with new contents, mainly related to: Research results, Scientific Publications, News about the project progresses and outputs, Tools for involving end users (e.g., the BONVOYAGE Questionnaire I and II). The Web site represents the actual "living report" concerning BONVOYAGE achievements and progresses. Accordingly, the most of contents reported in this Deliverable come from the Web Site.

The results of the partners' effort in disseminating and communicating BONVOYAGE activities and achievements are reported in three main official deliverables and one intermediate deliverable listed in submission chronological order:

- D8.5 - Website and Logo
- D8.1 - Communication & Dissemination Report v1: it describes dissemination and communication activities concerning the first half (M1-M18) of BONVOYAGE project
- I8.2 - Communication & Dissemination Report v2: this intermediate deliverable reports the update about the Dissemination and Communication activities performed by BONVOYAGE partners in the first 24 months.
- D8.2 - Communication & Dissemination Report v2 (the present document): it describes the overall activities carried out during the life span of the project (M1 – M36) in order to give a complete overview of the work performed.

VERSION CONTROL TABLE			
VERSION N.	PURPOSE/CHANGES	AUTHOR	DATE
D8.1			
0.1	Updated index, main contents	Maria Bianco	05/10/2016
0.2	Updated index, upgrading of main contents, dissemination plans	Etienne Labyt (CEA), Maria Bianco (CNIT)	16/10/2016
0.3	Internal Review	Silvia Canale (CRAT)	25/10/2016
1.0	Final Document	Maria Bianco (CNIT)	28/10/2016
1.1	Initial integration of the section 3.1 Strategy on Communication as requested by mid-term follow up	Emilio Calvanese Strinati (CEA)	08/03/2017
1.2	Internal Review	Andrea Detti (CNIT)	09/03/2017
1.3	Final version of the section 3.1	Emilio Calvanese Strinati (CEA)	29/03/2017
1.4	Internal Review, updated section numbers and figures 1,2,3	Maria Bianco (CNIT)	30/03/2017
2.0	Final revised Document	Andrea Detti (CNIT)	30/03/2017
I8.2			
0.1	Update of new activities descriptions	Maria Bianco (CNIT)	21/04/2017
0.2	Internal Review	Silvia Canale (CRAT)	24/04/2017
0.3	Editor's review	Emilio Calvanese Strinati (CEA)	25/04/2017
0.4	Final Internal review	Silvia Canale (CRAT)	27/04/2017
1.0	Final Revised Document	Maria Bianco (CNIT)	30/04/2017
D8.2			
0.1	Update of new activities descriptions	Maria Bianco (CNIT)	10/04/2018
0.2	Updates from partners	Nerea Rojas (MLC), Ignacio Gonzales (ATOS), Etienne Labyt (CEA), Dag Kjenstad (SINTEF)	20/04/2018
0.3	Internal review	Silvia Canale (CRAT)	25/04/2018
0.4	Final Internal review	Andrea Detti (CNIT)	26/04/2018

1.2 Objective and scope

The overall aim of the BONVOYAGE dissemination activities is to warranty a wide reaching impact and use of project deliverables among identified stakeholders: academic staff, industrial actors in transport/travel area, end-users, national and local institutions, research project managers and coordinators and funding entities. Therefore, research results, news and events are extensively disseminated and promoted by BONVOYAGE partners. Announcements via BONVOYAGE Web Site, LinkedIn discussion group and Twitter, as well as scientific publications, are regularly issued so to ensure that relevant information reach the targeted stakeholders and to promote their active involvement in the project activities according to their roles.

2 Dissemination and Communication activities

According to the DoA, the measures undertaken in order to maximise the impact of BONVOYAGE are composed of multiple strategic actions:

1. Communication activities: Web site and Social Networks on BONVOYAGE project have been created and are running with continuous update. An insight about the reach out of communication activities are reported in the analytics paragraph in Section 3;
2. Scientific dissemination: key personnel from BONVOYAGE have a demonstrated track record in scientific dissemination. Dissemination activities are reported in Section 4;
3. Dissemination tours and creation of awareness among user community: personnel involved in BONVOYAGE is committed to disseminate results through academic dissemination tours with invited guest lectures and BONVOYAGE-organized workshops, as well as with "marketing-oriented" presentations at industry events or in bilateral discussions with operators who are the final users of BONVOYAGE's results. A specific paragraph about industry events is reported in Section 3;
4. Standardization: BONVOYAGE's approach and achievements are reported in Section 5;
5. Open source prototypes: BONVOYAGE's prototypes have been released already having a strong open source commitment; these prototypes are able not only to be demonstrated but also usable to engage in Proof-of-Concept (PoC), see Section 6.

2.1 Individual Dissemination

The overall aim of BONVOYAGE project's dissemination activities is to warrantee a wide reaching impact, uptake and use of project deliverables among identified stakeholders: academic staff, institutions, industrials in transport/travel area, research project managers and funding entities. Therefore, dissemination has been considered from the beginning of the BONVOYAGE project. A guidelines form has been written and provided to all partners, in order to help them sharing research results, guiding the research process, and keeping the focus on the project's ultimate goal. In the following paragraphs a short summary about the dissemination and communication focus of each partner is reported. An extensive description of the activities is provided in sections dedicated to each target audience.

2.1.1. CNIT

CNIT Dissemination and Communication activities has been addressed towards six different directions:

- Scientific research communities: CNIT disseminated research results and main findings by addressing Scientific Journals, Conferences and Academic stakeholders. During the implementation of BONVOYAGE project 26 papers and articles were published in main conferences and journals. Furthermore, project presentations and relevant talks have been held in international conferences such as B2 MatchFest Brockerage Event in Las Vegas, IEEE Globecom 2016, Workshop on Information Centric Networking Solutions for Real World Applications, ITS Congress 2017, and Transport Research Arena 2018, just for naming a few.

- Standardization Bodies: CNIT is leading the standardization task in order to interact with standardization bodies for which the work proposed in BONVOYAGE is relevant. Several publications have been published within the IETF, IRTF- ICNRG standardization community.

- Collaboration with H2020 ITS Cluster: CNIT proactively participated to the ITS Cluster workshops by sharing resources and findings.

- Industry sector stakeholders: relevant target audience for CNIT is represented by industrial stakeholders. Main actions concerned the presentation of BONVOYAGE achievements to SAP executive event held in Italy in collaboration with TRENITALIA and CISCO Networking Innovation & Research Symposium.

- National/European Institutions involved in ITS: CNIT actively contributed in the establishment of collaboration towards the implementation of EU ITS Strategy based on directive EU 2010/40 (with Italian Ministry of Transportation) and its implementing policy.

- Students and researchers: CNIT disseminated project activities and results for improving educational offers for students and researchers for future research activities. Several EU research proposals have been drafted and submitted exploiting the BONVOYAGE main results and findings.

2.1.2. ATOS

ATOS Communication activities have been addressed to the following audiences:

- Internal company audience: Atos has circa 100,000 employees in 72 countries;

- Industry sector stakeholders: Atos serves a global client base including industrial stakeholders;

- National and EU actors involved in ITS, that attend I+D related events.

The communication actions performed were mainly addressed both to ATOS commercial departments (e.g., account managers) and to public and private transport industry. Announcements about BONVOYAGE project have been published on the public website and in the Atos Research & Innovation 2018 booklet (printed and online). Furthermore, results of the project and main achievements have been included in monthly Atos Research & Innovation newsletter as relevant project and shared within ERTICO (Europe's Intelligent Transportation Systems

Organization) where ATOS Research & Innovation is member. Constant effort has been also devoted to the social communication through Twitter.

2.1.3. CEA Leti

CEA Leti is a large applied research laboratory which provides the BONVOYAGE project with leading-edge technological expertise on microelectronics, sensors, microsystems, instrumentation, IC, and wireless telecommunication systems. Scientific dissemination is an important part of CEA researchers' missions and during the BONVOYAGE implementation, CEA papers and articles reached the following results: 11 citations, 7 articles and proceedings published and 6 attendances in national and international events. For internal communication, a guide of EU participation of CEA Leti in FP7 and H2020 projects has been written and BONVOYAGE project has been included. Other actions have been undertaken to investigate how advances achieved in BONVOYAGE should be used for new projects and funding. CEA Leti actively contributes to the AIOTI (Alliance for Internet of Things Innovation) and in particular in the working group "Wearables", where in the report recommendations, the BONVOYAGE project has been reported as an example illustrating what should be done with wearables in real-life (http://ec.europa.eu/newsroom/dae/document.cfm?action=display&doc_id=11819)

A flyer on CEA activities in the transport area including health and passenger comfort monitoring (stress level), one aspect of research work in BONVOYAGE, has also been edited for large communication to industrials, academic researchers, students and public.

2.1.4. Basque Country Partners (MLC, AZKAR, AYUNTAMIENTO DE BILBAO)

MLC-ITS Euskadi is an association integrated by different actors in the logistics and mobility of people and goods (fleet operators, loaders, technological companies, service providers, research institutes, public administrations…) having an active communication channel with them. MLC-ITS communication actions have been performed following two main channels: dissemination trough MLC networks (including web site and newsletter) and involvement of Basque stakeholders through dedicated meetings and interviews. MLC main target audience are:

- Public Authorities: Transport Authority of Gipuzkoa Province, Transport Authority of Bizkaia Province, Transport Department of the Basque Government.
- Mobility services providers: MKZ (car-sharing service provider), Gertek, Ingartek.
- Research and Academy: Tecnalia; University of the Basque Country; Deustotech.

MLC also organised face to face meetings with several Basque stakeholders in freight sector such as infrastructure managers (Port Authorities and Logistic Platforms) and logistics operators at urban/interurban and long distance level.

2.1.5. Consortium for Research in Automation and Telecommunication (CRAT)

CRAT contributed to dissemination activities mainly in terms of publications and education. As concerns scientific publications, the main reference journals included: Journal of Transport Economics and Policy, Transportation Research Part A: Policy and Practice, Transportation Research Part B: Methodological, 24th and 25th Mediterranean Conference on Control and Automation (MED 2017). As concerns education, a number of seminars concerning the intelligent functionalities developed in WP4 have been scheduled and given in Academic Years 2015-2016, 2016-2017 and 2017-2018 at the University of Rome "La Sapienza" in the framework of the School of Engineering in Computer Science and Control Engineering, the Master of Sciences in Control Engineering, and the Doctorate in "Automatica, Bioengineering and Operations Research" (ABRO PhD) offering advanced training course in the disciplines ING-INF/04, ING-INF/06 and MAT/09. CRAT also organized two Open Day for undergraduate students with specific focus on User Centric Intermodal Urban Soloist.

2.1.6. TRENITALIA

TRENITALIA dissemination was both focused towards internal audience by targeting Trenitalia Managers/Directors in order to raise awareness and inform them on BONVOYAGE goals, progress, and results and towards external audience such as stakeholders active in the passenger transport and the travel industry (e.g., transport operators). TRENITALIA established collaboration between BONVOYAGE and EU TRAVEL project by organizing a meeting in its premises in order to share insight and findings. Furthermore, TRENITALIA organized the SAP Executive event and participated with CNIT in the presentation of the project goals and relevant innovation. BONVOYAGE results have been included in TRENITALIA future development plans for multimodal transportation.

2.1.7. SINTEF

SINTEF dissemination was mainly addressed to scientific community by introducing he BONVOYAGE project on two prestigious international meetings, namely the 6th Cargese Workshop on Combinatorial Optimization and the 2016 Dagstuhl Seminar on "Algorithmic Methods for Optimization in Public Transport". A paper on Orchestrator was presented and published in the conference proceeding of Multidisciplinary International Scheduling Conference 2017. SINTEF

presented BONVOYAGE at the final conference of the project “HoPE: The Next Generation of Route Planners”.

2.1.8. NPRA

NPRA is responsible for making transport data available for its own basic services and for third party users, like developers and information service providers. NPRA is responsible for the Norwegian implementation of the ITS Directive and the EU delegated acts supplementing this legislation of the DIRECTIVE 2010/40/EU on the “framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport”. NPRA is a key stakeholder for National Access Point for traffic information and therefore contributed with strong effort in building effective linkages and information sharing between the development of the EU regulation for multimodal transport information services and the BONVOYAGE project.

3 BONVOYAGE Communication activities

3.1 Strategy on Communication

Effective internal and external BONVOYAGE communications are essential for the full and long lasting success of the project. Communication activities are also needed to stimulate both project partners and external target audience.

Moreover, communication activities are an indispensable means to gather feedback from interested groups and target audiences, and to increase the national and international visibility of the project.

BONVOYAGE has defined its communication strategy to determine which communication and dissemination channels would be effectively used. Indeed, communication activities and related efforts were concentrated on selected conferences, workshops, social media (mainly, LinkedIn and Twitter), website, consortium partners' internal communications, consortium meetings, public events, etc. as better documented in the next sections.

In the communication activities the message to convey has been about:

- Information of the BONVOYAGE project including objectives
- BONVOYAGE project's results, services and solutions
- Key events attended by the project partners

For each communication and dissemination activities of the project, selected target audiences have been addressed depending on the type of information to be communicated and the specific context of the communication.

In order to increase the effectiveness of BONVOYAGE dissemination and to update our communication tools and channels, communication activities have been monitored and reported during the whole duration of the project.

BONVOYAGE adopts the 6W principle for marketing and communication to maximize the impact of BONVOYAGE communication. Thanks to the 6W strategy, BONVOYAGE communication strategy is based on the following questions:

1. Disseminate Where: selected conferences, workshops, social media (LinkedIn, Twitter), website, press releases, consortium partners' internal communications, consortium meetings, public events, etc.
2. Disseminate When: Starting from day 1 and adapting to the timeline of the project, choosing the best match between content of communication and readiness of target audience.

3. Disseminate hoW: It is fundamental to nominate partners in charge and in responsibility for dedicated and specific dissemination activities and target audiences. Moreover, Project Coordinator (CNIT) and WP 8 leader (CEA) are in charge of cross check the effectiveness of dissemination activities according to the agreed dissemination goals and, to ensure that the content of dissemination and key delivered messages are clearly presented and carefully planned. Moreover, all partners were active for communication of project activities by disseminating and providing access to their specific communities. Such a communication work has been supported by the communication material and media prepared at the beginning of the project and constantly updated during the project lifecycle. Indeed, how to disseminate - coordinating activities of partners in the consortium according to the communication strategy.
4. Disseminate What: Target dissemination to well defined target audiences is fundamental for maximizing the impact on on-going and future activities of BONVOYAGE and its partners and to attract interest for target research communities, end users and industry in Europe and worldwide. Key messages communicated (through the communication channels presented in section 3 and 4) are on:
    a. what is the expected impact of the project?
    b. what the project is about?
    c. what are the partners of the project?
    d. what are the thirds parties that can be involved during and after the project lifecycle?
    e. what results are planned and when
    f. what are specific project objectives?

    Indeed, what to disseminate - What the project is about and what is its expected impact, What are the project objectives, Who is involved in the project, What results are planned and what is achieved.
5. To Whom disseminate: selected target audiences including research communities, industrial fora, ICT and SMEs companies and possible users of the proposed technologies, public authorities and applications demonstrated though the BONVOYAGE platform.
6. Why to disseminate: This is a fundamental question for enforcing the strategy on communication that helps in defining which the communication objectives of the project are. BONVOYAGE targets to raise awareness about its work and related results, to attack attention on its platform and solutions, on its experimentations and related results. In the WP8 description in the DoW, BONVOYAGE consortium stated the foreseen dissemination activities, communities to be addressed and, roles and responsibilities of partners. In particular, scientific dissemination is foreseen to disseminate scientific results to both

scientific communities and to industry. Moreover, exploitation of opportunities will be achieved thanks to (i) the proposition of new business models, (ii) thank to our experimentations and involvement of third parties. Indeed, why to disseminate - to raise awareness about the project, to promote the project work, to promote the replication of the results in other experimental platform beyond the project and, to ensure a maximum impact of the project results and findings in relevant communities.

3.2 Internal Communication

The number of partners of the BONVOYAGE Consortium required a consistent effort in sharing and circulating information among all the partners at various stages of the implementation plan and WPs interaction. A specific repository in BONVOYAGE SVN has been available for storing and collecting materials and documentation related to Dissemination activities. The BONVOYAGE SVN is based at the CNIT's premises and its URL is:

https://minerva.netgroup.uniroma2.it/svn/bonvoyage

3.3 Communication Activities

In this section we report the communication activities carried out by the project with respect to the following target audience:

- Exhibition and Fair and Congress
- General public dissemination
- Industrial Stakeholders;
- Cooperation with Related Projects;
- Scientific Publications

For the sake of completeness, the images below show the recorded activities performed during the whole duration of the project by BONVOYAGE partners. Specific details are described in the sections 4 and 5.

BONVOYAGE - Exhibitions, Fair, Congress, Workshop	Partner Involved/Proposer	Name of the activity	Type of activity	Location	Date
UITP Milan 2015 - Advancing Public Transport	FLU	Fair Visit	Dissemination	Milan, Italy	June 8-9, 2015
European Working Group on Transportation	SINTEF	Stakeholder Meeting	Exploitation	Delft, The Netherland	June 14-16, 2015
Sixth Cargese Workshop on	SINTEF	BNV Presentation	Dissemination	Corsica, France	September 14-18, 2015
ITS World Congress 2015 Bordeaux	FLU	Fair Visit	Dissemination	Bordeaux, France	October 5-9, 2015
B2 MatchFest Brockerage Event Las Vegas (https://www.b2match.eu/eaec-ces2016	CNIT	BNV Presentation	Dissemination	Las Vegas	January 4-5, 2016
CEBIT 2016	FLU	BNV Presentation	Dissemination	Hannover, Germany	March 14 - 18, 2016
Dagstuhl Seminar 16171 "Algorithmic methods for optimization in public transport "	SINTEF	Stakeholder Meeting	Dissemination	Wadern, Germany	April 24 – 29, 2016
Workshop: 5G pushing the limits of innovation in Automotive	CNIT	Speech	Dissemination	Glasgow, UK	June 6 - 9, 2016
IEEE Globecom 2016, Workshop on Information Centric Networking Solutions for Real World Applications	CNIT	Speech	Dissemination	Washinton DC	December 8, 2016
AUTOMATICA2016 event	CRAT	BNV Presentation	Dissemination	Rome, Italy	September 5 -7, 2016
1st European Conference on Connected and Automated Driving (CAD)	CEA	Stakeholder Meeting	Communication	Brussel, Belgium	April 3-4, 2017
ITS Congress 2017 - Panel "ITS Services"	CNIT	BNV Presentation	Dissemination	Strassbourg, France	June 19 - 22, 2017
ITS Congress 2017	CEA	Fair Booth	Dissemination	Strassbourg, France	June 19 - 22, 2017
Innova - go	MLC	Stakeholder Meeting	Communication	Bilbao, Spain	June 19, 2017
ITSWC 2017	FLU	Fair Booth	Dissemination	Montreal, Canada	October 29 – November 2, 2017
MISTA 2017	SINTEF	Article Presented	Dissemination	Kuala Lumpur, Malaysia	December 05 - 08, 2017
INV 2018	CNIT	Speech	Dissemination	Courmayeur, Italy	January 15 -17, 2018
TRA 2018	CNIT	Speech	Dissemination	Vienna, Austria	April 16 – 19, 2018

Figure 1 - Exhibition, Fair and Congress

BONVOYAGE - Stakeholder: General Public Dissemination	Partner Involved/ Proposer	Name of the activity	Type of Audience	Type of Activity	Location	Date
Newspaper "La Repubblica"	TRIT	Article Published	Travellers Communities	Communication	Rome, Italy	28/09/2016
EU Innovation & Research	All	Article Published		Communication	Brussels, Belgium	17/10/2016
Sapienza - Open day Department of Computer, Control, and Management Engineering "Antonio Ruberti"	CRAT	Presentation and flyer	End Users	Communication	Rome, Italy	09/03/2017
Online Industrie Techno	CEA	Article Published	Industrial Community	Communication	France	26/09/2017

Figure 2 – General Public Dissemination

BONVOYAGE - Target Stakeholder: Companies/Competitors	Partner Involved/Proposer	Name of the activity	Type of Activity	Type of Company	Location	Date
SAP Executive	TRIT - CNIT	Stakeholder Event	Expertise Involvement	Private Company Trasports	Rome/Pietrarsa	29/09/2016
CISCO Networking Innovation & Research Symposium	CNIT	Stakeholder Event	R&D collaboration	-	Rome, Italy	20-21/03/2017
Trondheim City Council	FLU	Tender - Hearing for a MasS pilot	Test Phase involvement	Public Service Providers	Trondheim , Norway	01-03/03/2017

Figure 3 – Industrial Stakeholder

Joint Collaboration with Bonvoyage	Partner Involved/Proposer	Name of the activity	Type of activity	Key Points	Target	Location	Date
EUTravel	TRENITALIA	EUTRAVEL Strategy Working Group	Project meeting	Information sharing and collaboration	R&D collaboration	Rome, Italy	26/06/2015
H2020 ITS Cluster	CNIT	H2020 Cluster	Conf Call	Establishing future collaboration among H2020 ITS projects	R&D collaboration	online	23/07/2015
INEA H2020 ITS & Connected Vehicles Coordinators Workshop	CNIT	H2020 Cluster	Coordinators Workshop	Establishing future collaboration among H2020 ITS projects	R&D collaboration	Brussels, Belgium	06/11/2015
H2020 ITS Cluster ConCall # 4	CNIT	H2020 Cluster	Conf Call	Workshop: Domains for cooperation	R&D collaboration	online	28/01/2016
CODECS Project	CNIT	H2020 ITS & Connected Vehicle Cluster		Communication Synergies	Information Sharing	online	01/02/2016
OPTIMUM Project	CNIT	Related project link on web site		Communication Synergies	Information Sharing	online	
CODECS Project	CNIT	Communication	Newsletter	Comm & Dissemination	Information Sharing	online	10/10/2016
INEA H2020 ITS & Connected Vehicles Coordinators Workshop	CNIT	H2020 Cluster	Coordinators Workshop	Collaboration on results	R&D collaboration	Brussels, Belgium	14/12/20016
HOPE Project	SINT	HoPE Project	Presentation	Dissemination, Exploitation, Networking	Information Sharing	Brussels, Belgium	9/5/2017
TIMON project	CNIT	Collaboration on ITS services	Common Workshop	Dissemination, Exploitation, Networking	Information Sharing	Strasbourg, France	22/06/2017
INEA H2020 ITS & Connected Vehicles Coordinators Workshop	CNIT	H2020 Cluster	Coordinators Workshop	Workshop: Domains for cooperation	R&D collaboration	Brussels, Belgium	11/12/2017

Figure 4 – Cooperation with Related Projects

BONVOYAGE - Target Stakeholder: Scientific Community	Partner Involved/ Proposer	Title of the pubblication	Authors	doi	Type of Pubblication	Location	Date
IRTF- ICNRG	CNIT	ICN based Architecture for IoT - Requirements and Challenges	Y. Zhang, D. Raychadhuri, L. A, Grieco, E. Baccelli, J. Burke, R. Ravindran, and G. Wang, IRTF Internet Draft, draftzhang-iot-icn-challenges-02, Aug 2015.		online		02, Aug 2015
IRTF- ICNRG	CNIT	Requirements and Challenges for IoT over ICN	Y. Zhang, D. Raychadhuri, L. Grieco, E. Baccelli, J. Burke, R. Ravindran, G. Wang, A. Lindren, B. Ahlgren, O. Schelen		online		November, 2015
IEEE Trans. on Circuits and Systems II	CNIT	Diameter Constrained Overlays with Faulty Links: Equilibrium, Stability, and Upper Bounds	L. A. Grieco et al.	10.1109/TCSII.2016.2530880	Journal		Dec 2015
AI & Society: Journal of Knowledge, Culture and Communication, Springer,	CNIT	Understanding the Social impact of ICN: between myth and reality	G. Piro, S. Signorello, M. R. Palattella, L. A. Grieco, G. J. Boggia, and T. Engel.	10.1007/s00146-016-0649-4	Journal		2016
SMART CITIES Czech Magazine	FLU	Platformy integrované mobility: nutnost pro služby mobility zítřka - Integrated Mobility platforms: indispensable for tomorrow's mobility services	Anton Fitzthum, Sales and Business Development, Fluidtime Data Services GmbH		Magazine		
The 24th Mediterranean Conference on Control and Automation	CRAT	"A Future Internet Oriented User Centric Extended Intelligent Transportation System"	S. Canale, A. Di Giorgio, F. Lisi, M. Panfili, L. Ricciardi Celsi, V. Suraci, and F. Delli Priscoli.	10.1109/MED.2016.7535967	Conferences	Athens, Greece	June 21 – 24, 2016
IEEE INFOCOM	CNIT	Tracker-assisted rate adaptation for MPEG DASH live streaming	A. Detti, B. Ricci, N.Blefari-Melazzi.	10.1109/INFOCOM.2016.7524620	Conferences	San Francisco, CA	April 10-15, 2015
North Atlantic Treaty Organisation (NATO), Science and Technology Organisation, Specialists' Meeting – SET- 222, on "Swarm Centric Solutions for Intelligent Sensor Networks"	CNIT	Information Centric Networking: a model for an improved Internet (and mobile/ad hoc networks)	Nicola Blefari Melazzi		Conferences	Rome, Italy	June 07-08, 2016
IEEE Transactions on Cloud Computing	CNIT	Gazing into the crystal ball: when the Future Internet meets the Mobile Clouds	G Piro, M. Amadeo, G. Boggia, C. Campolo, Grieco L. A., A. Molinaro, and G. Ruggeri	10.1109/TCC.2016.2573307	Journal		2017
SMC2016 IEEE International Conference on Systems, Man, and Cybernetics,	CEA	A Comparison of Wearable and Stationary Sensors for Stress Detection	Simon Ollander, Christelle Godin, Sylvie Charbonnier, Aurélie Campagne	DOI: 10.1109/SMC.2016.7844917	Conferences	Budapest, Hungary	October 9-12, 2016
Proc. of IEEE International Forum on Research and Technologies for Society and Industry Leveraging a better tomorrow (RTSI)	CNIT	Energy consumption analysis of TSCH-enabled platforms for the Industrial-IoT	P. Boccadoro, M. Barile, G. Piro, and L. A. Grieco		Conferences	Bologna, Italy	Sep., 2016.
IEEE Globecom 2016, Workshop on Information Centric Networking Solutions for Real World Applications	CNIT	OpenGeoBase: Information Centric Networking meets Spatial Database applications	Andrea Detti, Nicola Blefari Melazzi, Michele Orru, Riccardo Paolillo, Giulio Rossi	1607.00771v2	Conferences	Washington, DC USA	December 4-8, 2016
The Third International Workshop on The Emerging Future Internet and Network Security (EFINS 2016) in conjunction with Trustcom 2016	CNIT	Security Challenges in future NDN-Enabled VANETs	Salvatore Signorello, Maria Rita Palattella, Luigi Alfredo Grieco		Conferences	Tianjin, China	August 23 – 26, 2016
Third International Conference on Physiological Computing Systems – PhyCS 2016	CEA	Feature and Sensor Selection for Detection of Driver Stress	Simon Ollander, Christelle Godin, Sylvie Charbonnier, Aurélie Campagne	10.5220/0005973901150122	Conferences	Lisbon, Portugal	July 27 - 28, 2016
19th International Conference on Intelligent Transportation Systems – IEEE ITSC 2016	CEA	Transportation mode recognition based on smartphone embedded sensors for carbon footprint estimation	Lorintiu Oana, Vassilev Andrea	10.1109/ITSC.2016.7795875	Conferences	Rio de Janeiro, Brazil.	November 1 – 4, 2016
27th Scientific Meeting Italian Association of Engineering Management – RSA AilG 2016	CRAT	Revenue sharing mechanisms for airline-High Speed Rail cooperation under congested hubs	Avenali A., Bracaglia V., D'Alfonso T., Reverberi P		Conferences	Bergamo, Italy.	October 13 – 14, 2016
Transactions on Emerging Telecommunications Technologies (ETT)	CNIT	Link-layer Security in TSCH networks: effect on slot duration	S. Sciancalepore, M. Vucinic, G. Piro, G. Boggia, and T. Watteyne	10.1002/ett.3089	Journal		Jun., 2016
Forthcoming on Transportation Research Part A: Policy and Practice	CRAT	Air transport and high speed rail competition: environmental implications and mitigation strategies	D'Alfonso T., Jiang C., Bracaglia V.		Journal		

BONVOYAGE - Target Stakeholder: Scientific Community	Partner Involved/ Proposer	Title of the pubblication	Authors	doi	Type of Pubblication	Location	Date
8th INTERNATIONAL CONGRESS ON TRANSPORTATION RESEARCH	CEA	Real time monitoring of traveller's psychological stress	Gaël Vila, Simon Ollander, Christelle Godin, Etienne Labyt, Sylvie Charbonnier, Aurélie Campagne		Conferences	Thessaloniki, Greece	September 27-29, 2017
IEEE ICC 2017	CNIT	Preference-aware fast interest forwarding for video streaming in information-centric vanets	Mu Wang, Changqiao Xu, Shijie Jia, Jianfeng Guan, and Luigi Alfredo Grieco		Conferences	Paris, France	May 21-25, 2017
2nd Convergent Internet of Things (C-IoT) Workshop, IEEE ICC 2017	CNIT	A secure ICN-IoT architecture.	S. Sicari, A. Rizzardi, L. A. Grieco, and A. Coen-Porisini		Conferences	Paris, France	May 21-25, 2017
Transportation Research Part B: Methodological	CRAT	Air-Rail Cooperation: Partnership Level, Market Structure and Welfare Implications	C. Jiang, T. D'Alfonso, Y. Wan	10.1016/j.trb.2017.01.006	Journal		Jan 2017
PhD Thesis	CRAT	Accurate vehicle positioning and multimodal journey planning for new smart mobility scenarios	R. Gambuti		PhD Thesis		Feb 2017
2016 Kuhmo NECTAR conference on Transportation Economics ITEA	CRAT	Market Structure and Partnership Levels in Air-Rail Cooperation	C. Jiang, T. D'Alfonso, Y. Wan		Conferences	Santiago De Chile (Chile)	June 15-17, 2016
IEEE LANMAN'17	CNIT	"Application of Information Centric Networking to NoSQL Databases: the Spatio-Temporal use case"	Andrea Detti, Michele Orru, Riccardo Paolillo, Giulio Rossi, Pierpaolo Loreti, Lorenzo Bracciale, Nicola Blefari Melazzi		Conferences	Osaka, Japan	June 12-14, 2017
25th Mediterranean Conference on Control and Automation (MED 2017)	CRAT	On the Many-to-Many Carpooling Problem in the Context of Multi-Modal Trip Planning	L. Ricciardi Celsi, A. Di Giorgio, R. Gambuti, A. Tortorelli, F. Delli Priscoli.		Conferences	La Valletta. Malta	July 3-6, 2017
IRTF- ICNRG	CNIT	ICN based Architecture for IoT	Y. Zhang, D. Raychadhuri, L. A, Grieco, S. Sabrina, H. Liu, S. Misra, R. Ravindran, G. Wang,		online		July 16, 2017.
IEEE AVSS	CNIT	Information-Centric Networking in Environmental Monitoring: an overview on publish-subscribe implementations	Agnese V Ventrella, Giuseppe Piro, and Luigi Alfredo Grieco		paper	Lecce, Italy	August 29, 2017
IET Wireless Sensor Systems	CNIT	Industrial Internet of Things at work: a case study analysis in Robotic-aided environmental monitoring	V. Scilimati, A. Petitti, P. Boccadoro, R. Colella, D. Di Paola, A. Milella, and L.A. Grieco		Journal		2017
SOLI 2017	CNIT	Information-centric publish-subscribe mechanisms for Intelligent Transportation Systems	Agnese V Ventrella, Giuseppe Piro, and Luigi Alfredo Grieco		Conferences	Bari, Italy	Sep., 2017.
2017 Tyrrhenian International Workshop on Digital Communications, Towards A Smart And Secure Future Internet	CNIT	A de-verticalizing middleware for IoT systems based on Information Centric Networking design	Giuseppe Piro, Giuseppe Ribezzo, Luigi Alfredo Grieco, and Nicola Blefari-Melazzi		Conferences	Palermo, Italy	Sep., 2017.
IETF	CNIT	Design Considerations for Applying ICN to IoT	D. Raychadhuri, L. Grieco, E. Baccelli, J. Burke, R. Ravindran, G. Wang, A. Lindgren, B. Ahlgren, O. Schelen		online		June 26, 2017.
Computer Networks (Elsevier)	CNIT	Publish-subscribe in mobile information centric networks: modeling and performance evaluation	A. V. Ventrella, G. Piro, and L. A. Grieco		Journal	Computer Networks	2017
IABE Conference - International Academy of Business and Economics	CRAT	Incentives to airline-high speed rail cooperation under hub congestion: an antitrust perspective	Avenali, A., Bracaglia, V., D'Alfonso, T., Reverberi, P.		Conferences	Las Vegas	July 2017
8th International Congress on Transportation Research - ICTR 2017, Thessaloniki, Greece	CEA	Real time monitoring of traveller's psychological stress	Gaël Vila, Simon Ollander, Christelle Godin, Etienne Labyt, Sylvie Charbonnier, Aurélie Campagne		Conferences	Thessaloniki, Greece	September 27-29, 2017
MISTA 2017	SINTEF	"Orchestrator" approach to multimodal continental trip planning	Lukas Bach; Dag Kjenstad; Carlo Mannino.		Conferences	Kuala Lumpur, Malaysi	December 05 - 08 2017
IEEE Transactions on Mobile Computing	CNIT	Optimal Information Centric Caching in 5G Device-to-Device Communications	Changqiao Xu, Mu Wang, Xingyan Chen, Lujie Zhong, and Luigi Alfredo Grieco		Journal		

BONVOYAGE - Target Stakeholder: Scientific Community	Partner Involved/ Proposer	Title of the pubblication	Authors	doi	Type of Pubblication	Location	Date
IEEE International Conference on Communications (ICC)	CNIT	Experimental comparison of Industrial Internet of Things protocol stacks in Time Slotted Channel Hopping scenarios	Piero Boccadoro, Giuseppe Piro, Domenico Striccoli, and Luigi Alfredo Grieco		Conferences	Kansas City, MO, USA	May 2018
Information Centric Networking Solutions for Real World Applications (ICN-SRA), IEEE ICC 2018	CNIT	A novel ICN-based communication bus for Intelligent Transportation Systems	Mauro Losciale, Pietro Boccadoro, Giuseppe Piro, Giuseppe Ribezzo, Luigi Alfredo Grieco, and Nicola Blefari-Melazzi		Conferences	Kansas City, MO, USA	May 2018
European Wireless 2018	CNIT	A standard-compliant and information-centric communication platform for the Internet of Drones	Pietro Boccadoro, Mauro Losciale, Giuseppe Piro, and Luigi Alfredo Grieco		Conferences	Catania, Italy,	May, 2018
Elsevier Computer Networks	CNIT	Modeling lru cache with invalidation	A. Detti, L. Bracciale, P. Loreti, N. Blefari Melazzi	10.1016/J.Comnet.2018.01.029	Journal		

FIGURE 5 – Publications

3.4 BONVOYAGE Leaflet

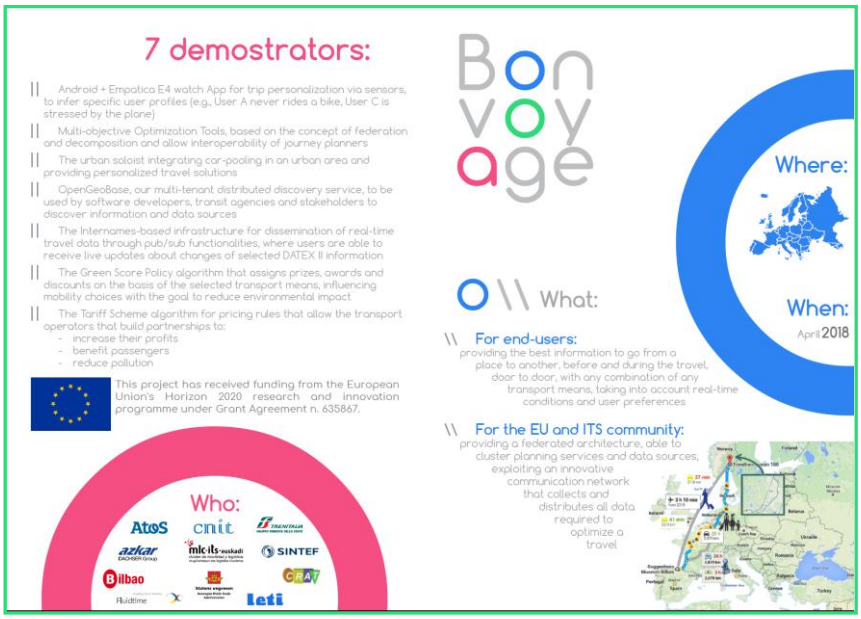
Classical print media (e.g., brochure and posters) has been produced to be freely circulated for project information and promotion at workshops, trade shows, industrial fairs, congresses, and other public and private events. The BONVOYAGE Leaflet describes in a concise manner the project, its main goals and steps and its partners. Other flyers can be produced on a per-need basis[1].

A first Leaflet has been realized by CNIT in electronic version (pdf and ppt files) and has been circulated among Partners in order to allow them to print paper copies on a per-need basis. The electronic version of materials is also downloadable from the BONVOYAGE web site in the section "Download", accessible from the Footer menu of the website and by the SVN project repository, so to guarantee outer and inner dissemination.

[1] An ad hoc flyer has been produced in occasion of one of the academic dissemination activities reported in section 4.7

FIGURE 6 – BONVOYAGE Leaflet

BONVOYAGE has realized an intermediate brochure about the project in occasion of the EC review held in Brussel on 24th November 2016. Special emphasis has been granted to the description of the demonstrators and to main achievements evinced at that time.



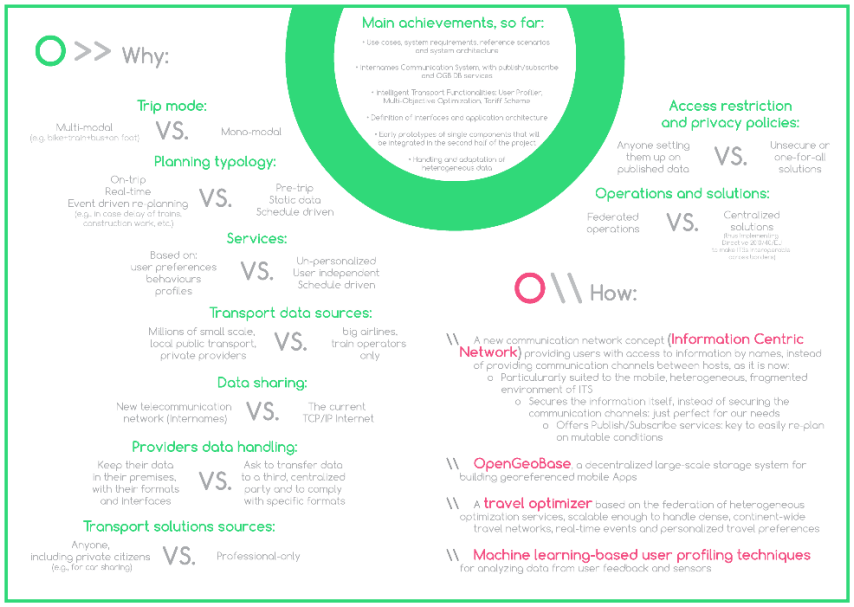
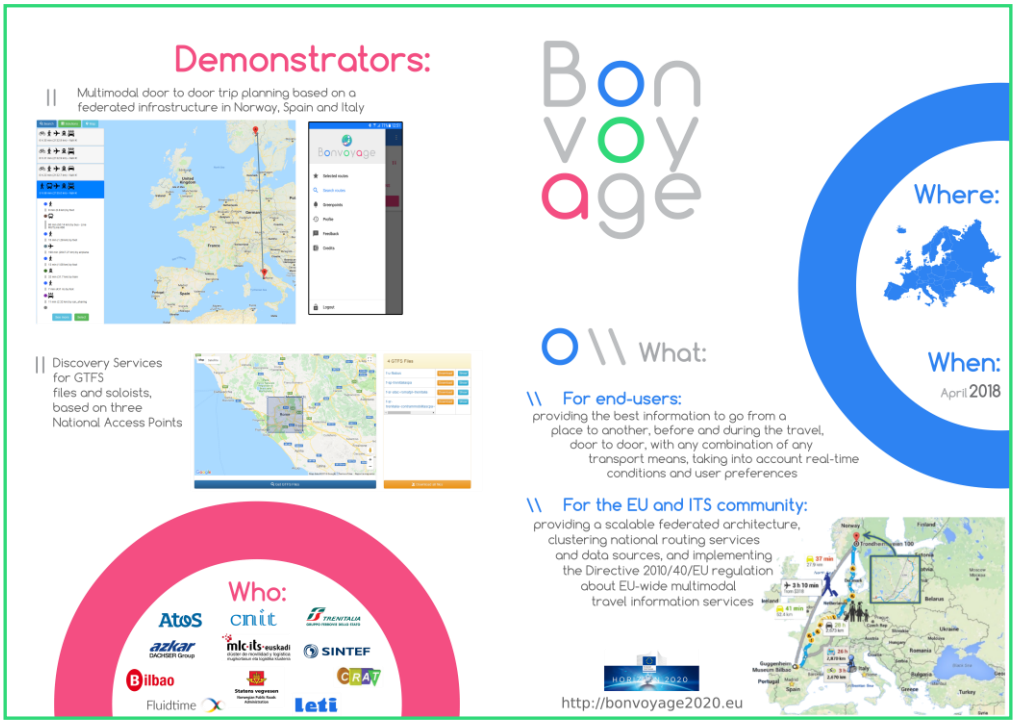


Figure 7 – BONVOYAGE brochure 2016

A new Brochure has been realised as Deliverable D8.6 – Final BONVOYAGE brochure. Main achievements and demonstrator contents have been updated according to last development of the project.



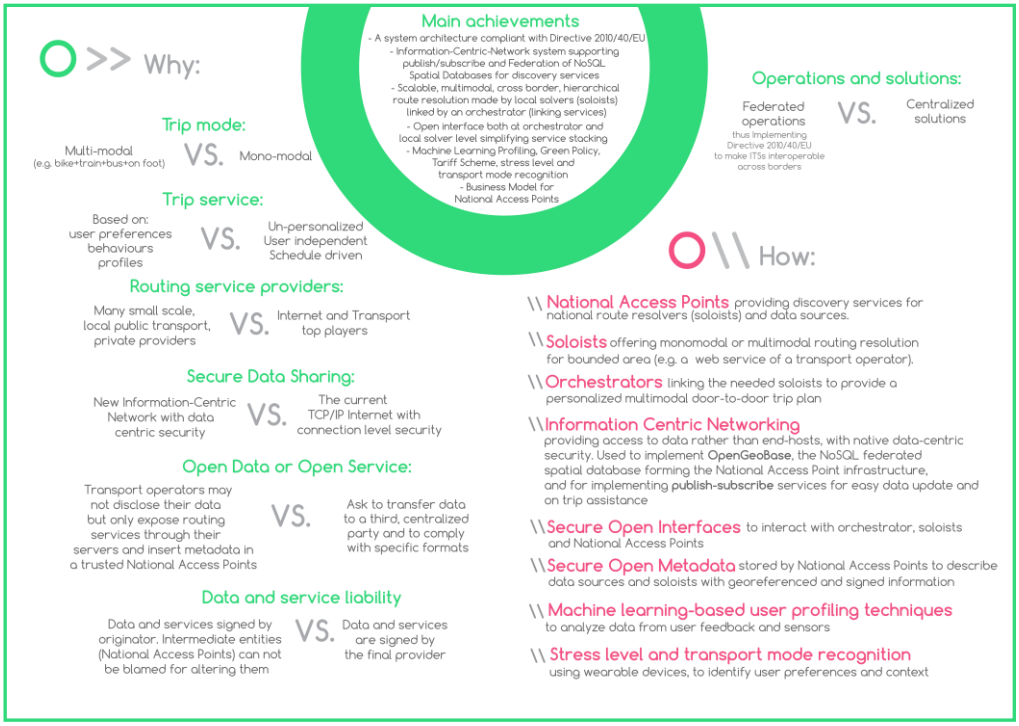


Figure 8 – D8.6 Final BONVOYAGE Brochure

The leaflet and the brochures can be downloaded from the BONVOYAGE web site.

3.4.1 Acknowledgement of EU funding

Any material produced within the BONVOYAGE Dissemination and Communication activities and which is addressed to an external audience shall comply with the terms of GA – Article 29.4 - Information on EU funding – Obligation and right to use the EU emblem. Accomplishing this rule, material shall report in a visible way the following elements:

- the EU emblem, i.e. the European flag[2];
- it is mandatory to quote the following (or similar) sentence in any dissemination material produced: *"This project has received funding from the European Union's Horizon 2020* research and innovation programme under Grant Agreement No 635867".

3.5 BONVOYAGE Posters

This first Poster has been realized in occasion of participation of the partner CEA Leti to the Third International Conference on Physiological Computing Systems (PhyCS 2016) which was held in Lisbon on 27th and 28th July 2016.

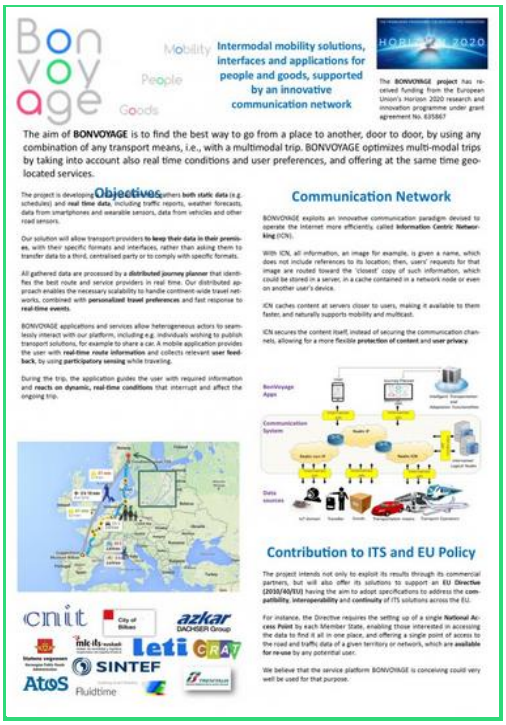


FIGURE 9 – BONVOYAGE Poster

The Poster is available for download on the Web site from "Communication" section.

[2] http://europa.eu/about-eu/basic-information/symbols/flag/

FIGURE 10 –Simon Ollander from CEA Leti presenting the Poster at PhyCS 2016

A second poster has been realised in occasion of the Project review held in Brussel on 24th November 2016.

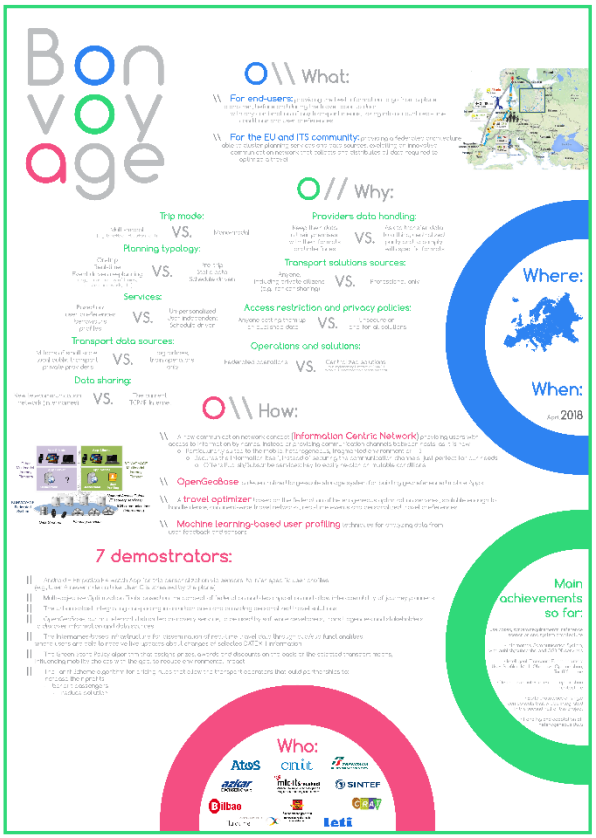


Figure 11 – Second BONVOYAGE Poster

3.6 BONVOYAGE Web site

A public website for BONVOYAGE project was set up at the beginning of the project and will be available after the end of the project for at least three years. The website is accessible online at the following address:

http://bonvoyage2020.eu/

The website is regularly updated with project-related activities and announcements. The main Structure of the Web Site has been described in the Deliverable D8.5, delivered in due time at month 6 (October 2015).

At content level, the BONVOYAGE Web Site has been enriched with the description of activities and achievements. Here below we provide a description of the pages which are regularly updated.

- About -> Step by Step - BONVOYAGE Road Map
- About -> Related Projects: In this page, related Projects' logos and links have been added. We expect to add more EU projects and initiative to collaborate with in the future
- Results -> Communication -> Download: in this section, it is possible to download general communication such as Presentation, Posters and Brochures. Download section is accessible from the Footer menu as well.
- Results -> Dissemination: in this page, all the dissemination activities have been recorded such as Participation at International Conferences, Fairs and Publications.
- Results -> Standardization: in this page Standardization works and papers are published
- Results -> Deliverables: in this page, the complete list of Deliverables has been published. Public deliverable can be downloadable by general public, while confidential deliverables can be downloadable only through a private account via the web site. The project Officer and the reviewers have been provided with access credentials in occasion of the review meeting.
- News: this section is the blog of the Web site. The news published in this section are shared through LinkedIn and Twitter Account. To date, 19 News have been published. In the following sections, we will describe the communication activities performed through Social Networks. In the section 3.7 we report a screenshot of the NEWS' page.
- Social: contains the direct links to BONVOYAGE Social Networks' accounts: LinkedIn and Twitter. This section is accessible also from the Footer Menu.

Since the beginning of the project, two new sections have been updated and added to the original structure. The section "Survey" aims at collecting data about passenger's travel behavior and the levels of quality of transport services as perceived by users. The survey is accessible both from

Header Menu and from the Right Bar available on every page. The aim is that of gathering data for further analysis within the BONVOYAGE project. In particular, the so called intelligent functionalities developed in the project are completely new and innovative. Therefore, a careful analysis of users' experience and expectations about multimodal transportation means and services was fundamental to drive research and development in this field. On the other side, by involving the largest number of end users directly in the user need identification phase, the BONVOYAGE team took advantage of promoting the survey in order to disseminate the project's scopes and objectives since the very early months of the project.

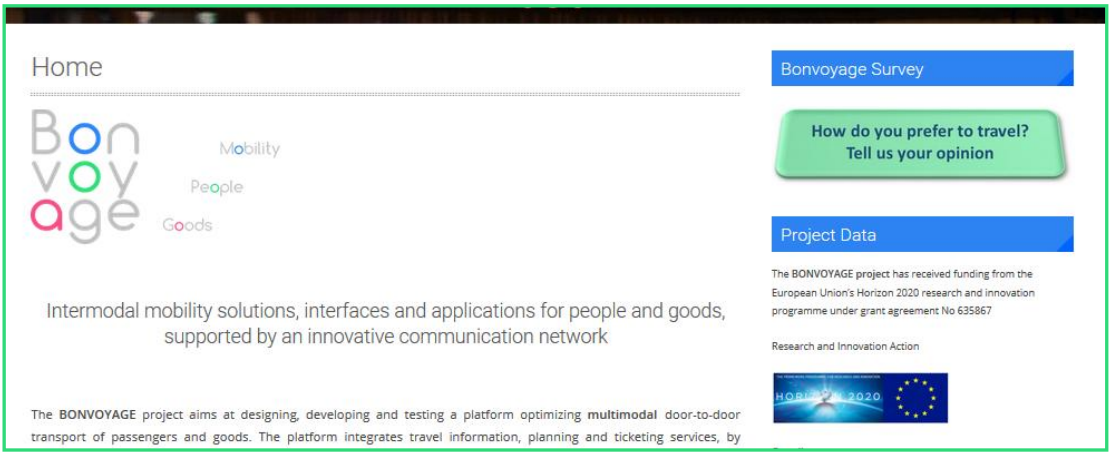


FIGURE 12 – BONVOYAGE Survey access

The very latest changes concern the creation of two brand new sections dedicated to Project review and BONVOYAGE Demos. They are marked in red in Figure 13.

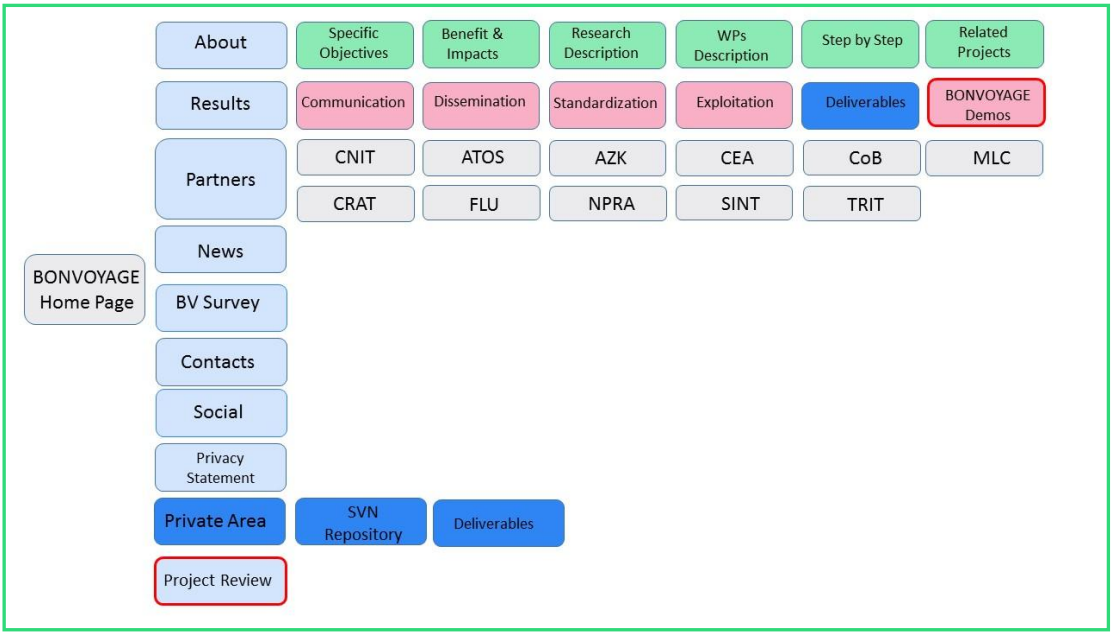


FIGURE 13 – WEB SITE updated Structure

The section "BONVOYAGE Demos" belongs to the main menu "Results" and contains information related to developed Demos.

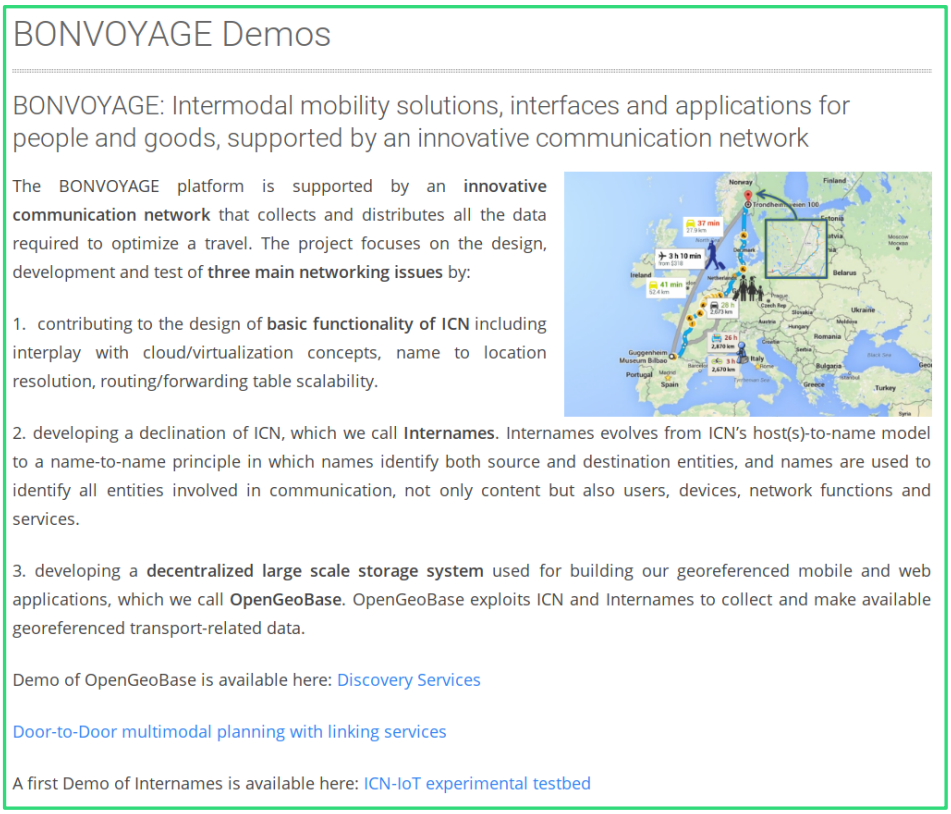


FIGURE 14– ***BONVOYAGE Demos' page***

The Section "Project Review" has been conceived as a unique repository of all the information related to the EC Project reviews (http://bonvoyage2020.eu/project-review/). The first official review took place in Brussels on 24th of November 2016. This page is protected by a password and is available for Partner and EC Reviewers. All contents reported in this page are protected also from indexing.

In this page, the consortium collected all the information related to and useful for the Review Meeting such as:

- Venue: Meeting date and Location;
- Contractual Description of Work: official Grant Agreement;
- Agenda of the Review Meeting;
- Presentations: here we collected all the presentation prepared for the Review Meeting;
- Deliverables: this list gave reviewers the access to all the deliverables submitted at that date, both public and private deliverable.

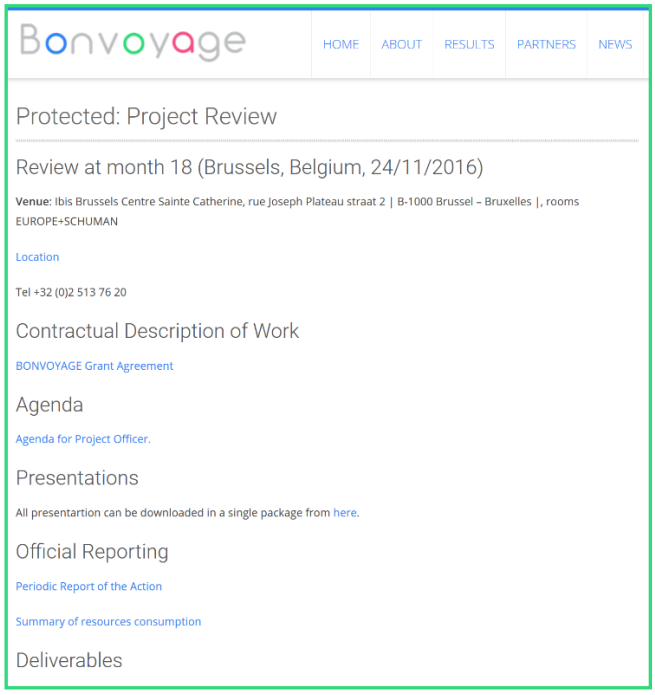


FIGURE 15 – Project Review page

3.7 BONVOYAGE News

The "NEWS" section counts 19 posts published since the beginning of the project. These posts have been shared on BONVOYAGE Social Networks. The News style consist in a short description of the event/achievement in order to ensure a quick and effective communication. All the available additional material (such as web sites, presentation and/or articles) has been added for further consideration.

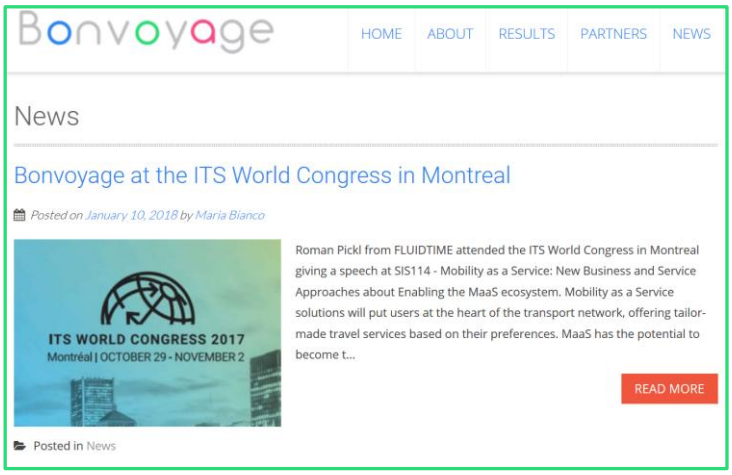


FIGURE 16– News on Conference participation

FIGURE 17 – BONVOYAGE NEWS page

3.7.1. GOOGLE ANALYTICS OVERVIEW

We added the Google Analytics tracking code in the template of BONVOYAGE website, enabling the tracking of statistics of the project's website. Key statistics are Figure 18 - Audience General Overview.

According to BONVOYAGE Officer's requests, the Coordinator issued a web site metrics report every four months along with the Internal Reporting Periods.

In this Deliverable we give a General Overview about analytic metrics in the period September 2016 – April 2018.

Due to an unforeseen problem related to "Ghost/Referral spam" (https://en.wikipedia.org/wiki/Referer_spam), statistics from the initial setting up of Google Analytics were altered. Therefore analytics data before September 2016 show altered results which are not reliable. From an internal analysis carried out at CNIT, Google analytics data showed an alteration percentage about 30% of the real traffic. As we recognized altered metrics a corrective action was taken: a filtering software was set up in order to get a real insight about the web site view and related sessions.

Thus since September 2016 till April 2018, Google Analytics shows the following main data:

- N. of Sessions: 4812
- N. of Users: 3034
- Page Views: 11777
- Pages/Sessions: 2,45
- Average session duration: 2 min 46 sec
- Bounce Rate: 62.128%
- % New Session: 86.9%

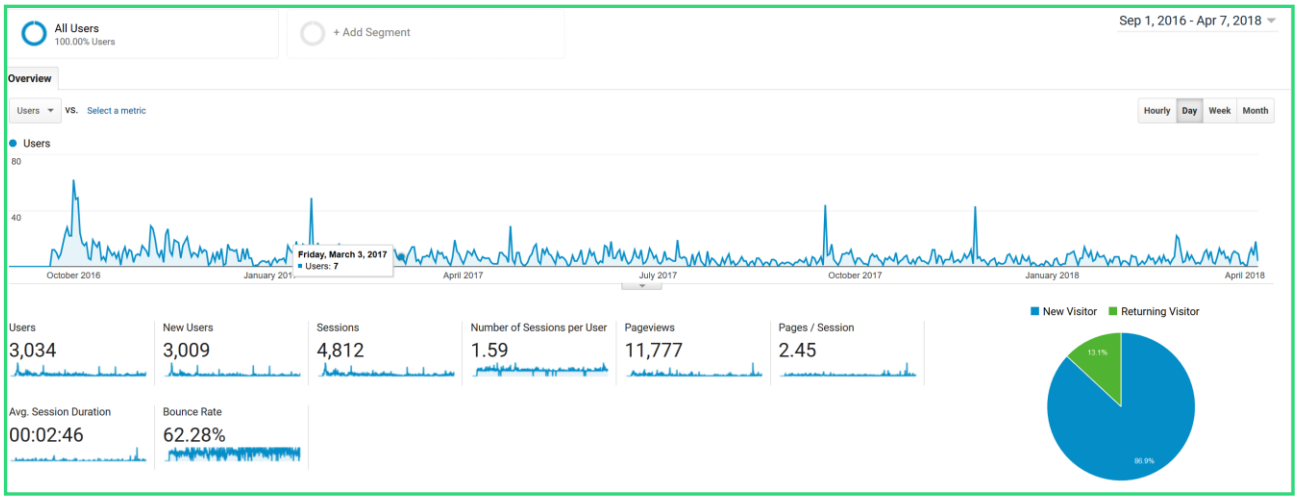


FIGURE 18 - Audience General Overview

3.7.2. NEW VS RETURNING

Concerning the Audience, we can see that 86,9 % of users are New Visitors. In the figure below, we can see that New Visitors performed in the referring period 4812 sessions and an Average Session Duration of about 1,27 minutes. Returning Visitors performed 1801 sessions with an average session duration of about 4,59 minutes.

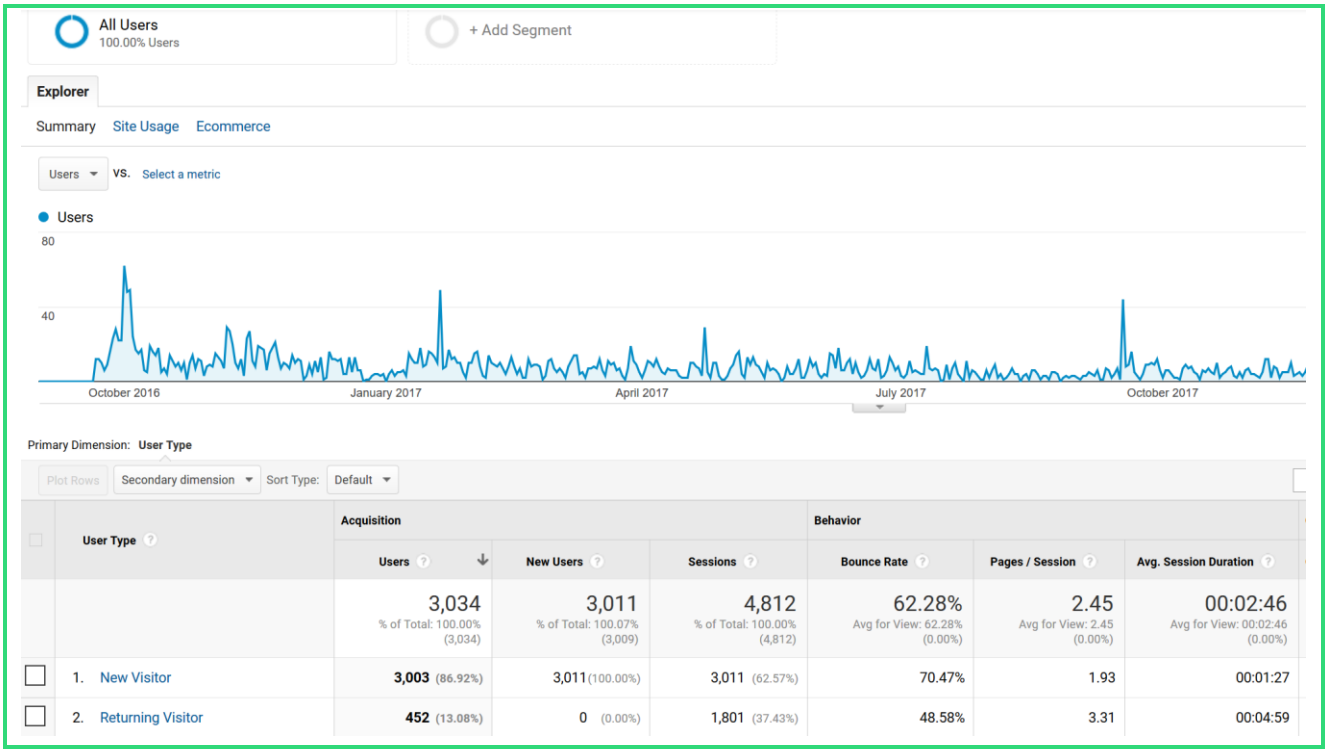


Figure 19: New Visitors and Returning Visitors

3.7.3. ACTIVE USERS

The figure below shows the number of Active Users per time period. "Active Users" means the number of unique users who visited the website in the last 1 day – 30 days in the selected time period.

1 day: 4 users

7 days: 42 users

14 days: 64 users

30 days: 137 users

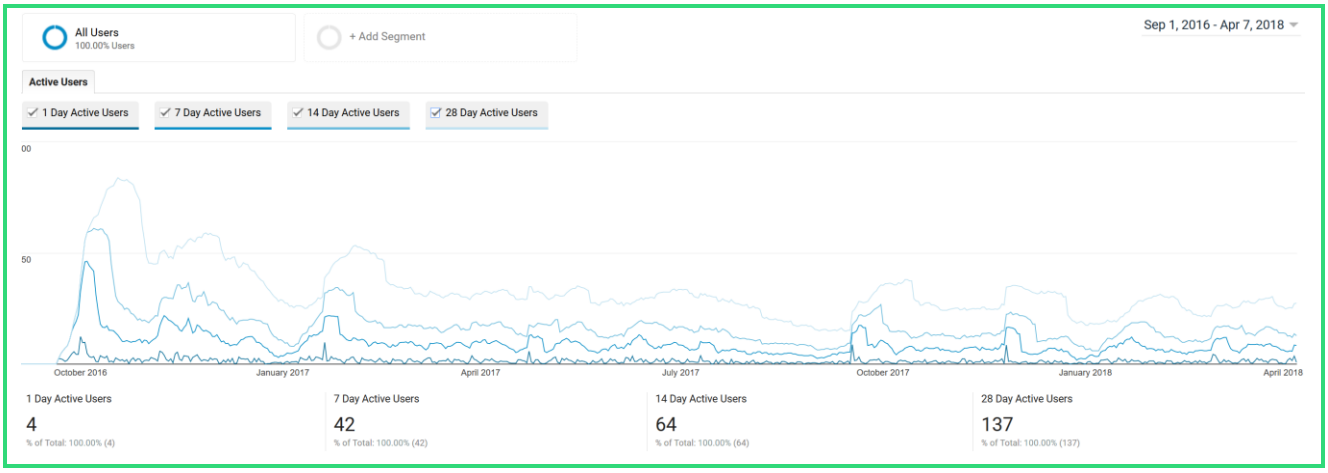


Figure 20: Number of unique users per n. of days

3.7.4. LOCATION

Here below is shown an Analytics map about the number of accesses from different countries.

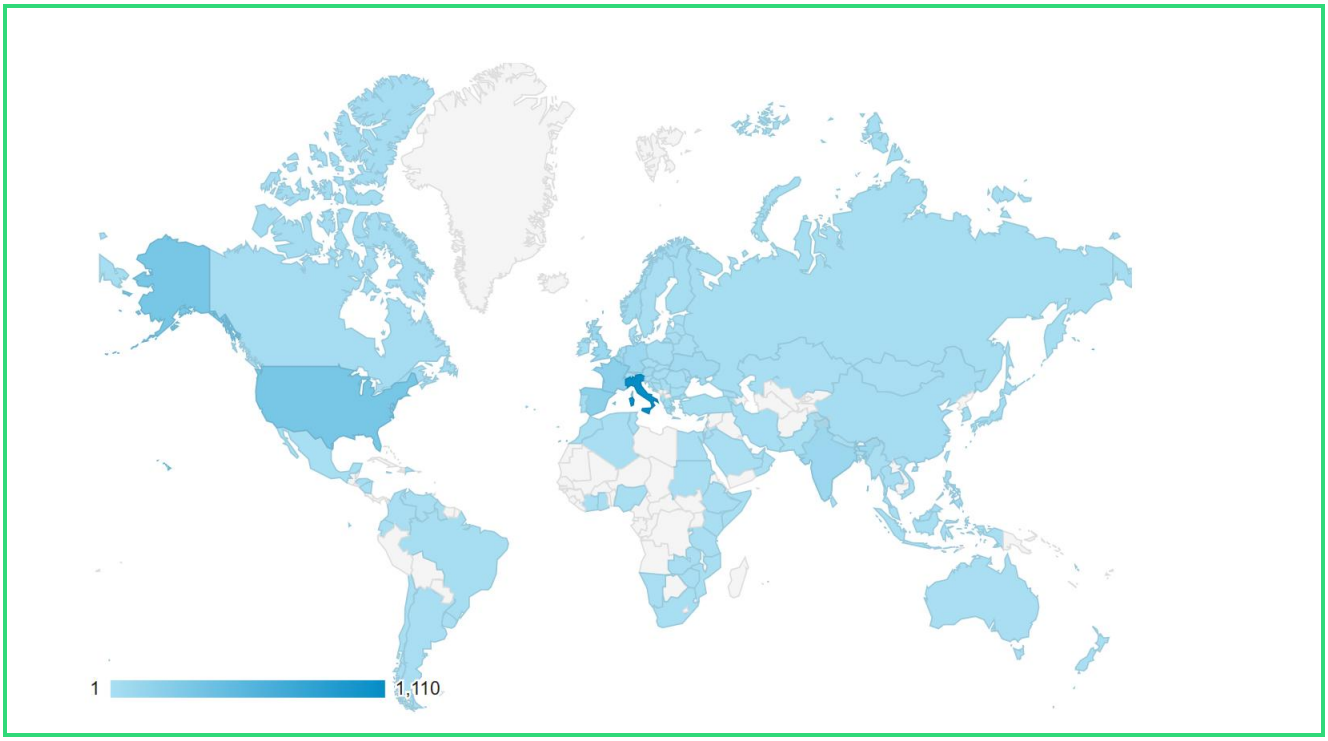


Figure 21: World map of Users

Here below are reported the number of access for the first 10 countries in the list. We can see a relevant number of accesses from: Italy, US, France, Spain.

Country	Acquisition			Behavior		
	Users ↓	New Users	Sessions	Bounce Rate	Pages / Session	Avg. Session Duration
	3,034 % of Total: 100.00% (3,034)	3,011 % of Total: 100.07% (3,009)	4,812 % of Total: 100.00% (4,812)	62.28% Avg for View: 62.28% (0.00%)	2.45 Avg for View: 2.45 (0.00%)	00:02:46 Avg for View: 00:02:46 (0.00%)
1. Italy	**1,110** (36.14%)	1,096 (36.40%)	2,429 (50.48%)	54.63%	2.74	00:03:51
2. United States	**329** (10.71%)	326 (10.83%)	339 (7.04%)	91.74%	1.18	00:00:25
3. France	**204** (6.64%)	199 (6.61%)	285 (5.92%)	62.46%	2.25	00:01:31
4. Spain	**191** (6.22%)	183 (6.08%)	259 (5.38%)	55.60%	2.75	00:02:32
5. India	**104** (3.39%)	104 (3.45%)	108 (2.24%)	77.78%	1.37	00:00:28
6. Germany	**93** (3.03%)	89 (2.96%)	107 (2.22%)	65.42%	2.21	00:01:32
7. United Kingdom	**92** (3.00%)	92 (3.06%)	102 (2.12%)	66.67%	1.84	00:00:39
8. Belgium	**80** (2.61%)	74 (2.46%)	122 (2.54%)	54.10%	2.40	00:01:40
9. Austria	**63** (2.05%)	59 (1.96%)	106 (2.20%)	49.06%	3.68	00:04:31
10. Ukraine	**53** (1.73%)	53 (1.76%)	55 (1.14%)	94.55%	1.15	00:00:36

Figure 22: Number of Sessions per Countries

3.7.5. PAGE BUSINESS PERFORMANCE EFFICIENCY

The figure below shows pages with the best performing contents.

The first most visited page is the Home page while the second best performing content has been the "Long Distance Travels Preferences", the survey launched by the project aiming at analyzing passengers' preferences in long distance travels.

Page Title	Entrances ↓	Users	Pageviews	Bounces
	4,812 % of Total: 100.00% (4,812)	3,034 % of Total: 100.00% (3,034)	11,777 % of Total: 100.00% (11,777)	2,997 % of Total: 100.00% (2,997)
1. Bonvoyage 2020 Project | Bonvoyage 2020 Project	**1,838** (38.20%)	1,252 (21.22%)	2,582 (21.92%)	883 (29.46%)
2. Long Distance Travels Preferences | Bonvoyage 2020 Project	**466** (9.68%)	402 (6.81%)	733 (6.22%)	337 (11.24%)
3. CEA – LETI | Bonvoyage 2020 Project	**208** (4.32%)	229 (3.88%)	284 (2.41%)	163 (5.44%)
4. Travel Centric Services | Bonvoyage 2020 Project	**201** (4.18%)	129 (2.19%)	496 (4.21%)	134 (4.47%)
5. ATOS Spain | Bonvoyage 2020 Project	**192** (3.99%)	223 (3.78%)	271 (2.30%)	153 (5.11%)
6. Consorzio per la Ricerca nell'Automatica e nelle Telecomunicazioni | Bonvoyage 2020 Project	**181** (3.76%)	211 (3.58%)	269 (2.28%)	152 (5.07%)
7. Travel Centric Services Devel | Bonvoyage 2020 Project	**177** (3.68%)	27 (0.46%)	715 (6.07%)	97 (3.24%)
8. Specific Objectives | Bonvoyage 2020 Project	**146** (3.03%)	306 (5.19%)	479 (4.07%)	120 (4.00%)
9. Routing-Services | Bonvoyage 2020 Project	**112** (2.33%)	27 (0.46%)	212 (1.80%)	75 (2.50%)
10. Trenitalia | Bonvoyage 2020 Project	**105** (2.18%)	146 (2.47%)	216 (1.83%)	71 (2.37%)

Figure 23: Best performing contents

3.8 LinkedIn

A BONVOYAGE Group page has been created on LinkedIn (BONVOYAGE – Intermodal Mobility Solutions) and all the Partners Team individuals have been invited in joining the Group. The LinkedIn group is available at:

https://www.linkedin.com/groups/8349701

The group accounts today 65 members, out of them 28 members are interested people not included in the Consortium.

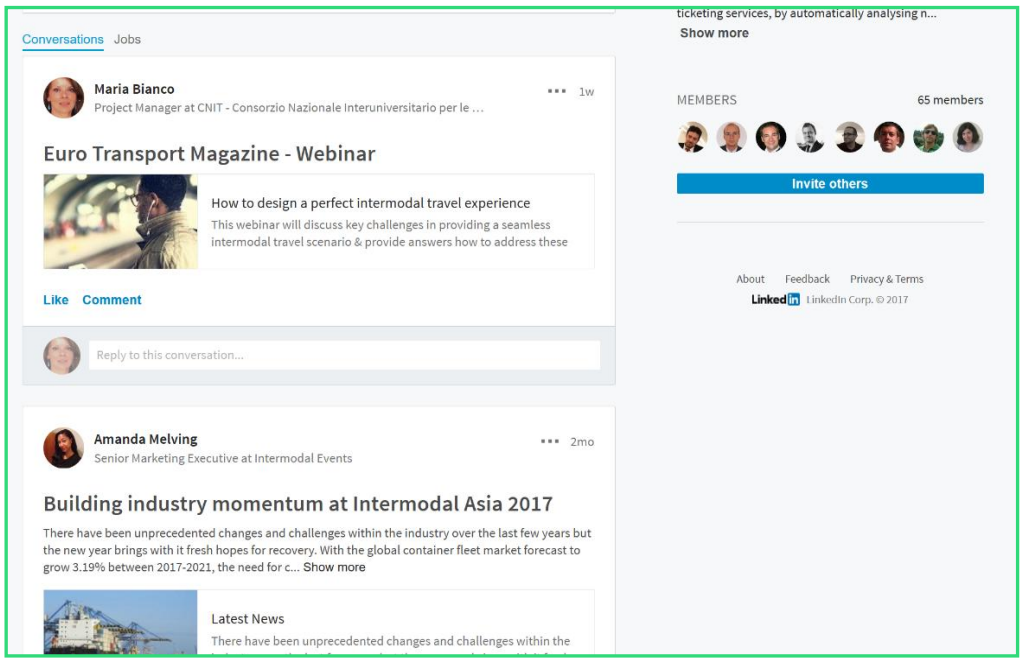


FIGURE 24– LinkedIn Group

On the LinkedIn group have been shared all the News and information published on the BONVOYAGE web site. 25 discussions were published.

3.9 Twitter

Twitter is a powerful social network for spreading information with a quick and short message and for reaching a large amount of people and even specific audience by selecting a definite hashtag. Through Twitter the BONVOYAGE project is able to inform and update stakeholders, general public and even EU organizations by sharing News published on the Web site, events' organization and participation and relevant news coming from official EU information channels.

The BONVOYAGE account was created in January 2016 and to date it counts 75 followers. Among these followers, we can quote the most important such as:

- INEA: The Innovation and Networks Executive Agency is in charge of the project & financial management of EU co-funded programmes;
- European Transport Conference: Association for European Transport;
- ITS Observatory: A one-stop catalogue on ITS;
- ITS Europe – Ertico: a partnership of around 100 companies and institutions involved in the production of Intelligent Transport Systems (ITS);
- Multimodal 2017: Advanced Supply Chain Management and Logistics for Shippers and Cargo Owners;
- Freight TAILS: URBACT III Funded project, led by Cross River Partnership, working to reduce the impact of freight in ten cities across Europe;
- ITS Automotive Nord: Mobilitätscluster Deutschlands.

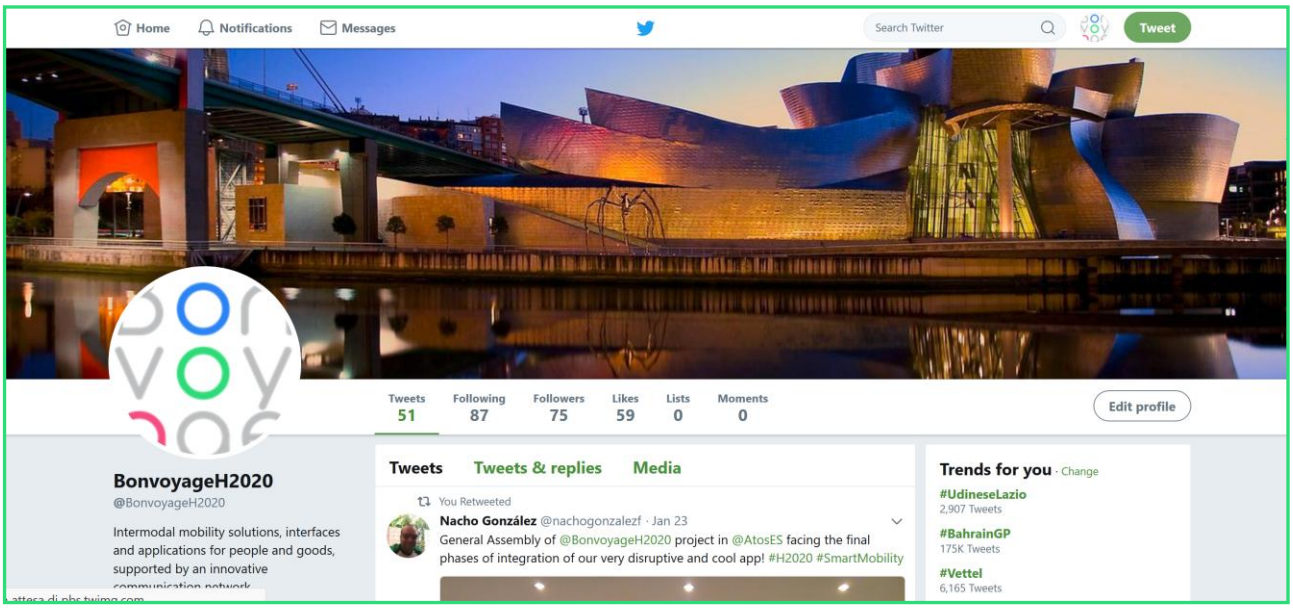


FIGURE 25 – Twitter page

BONVOYAGE project tweeted 51 posts and received appreciations and retweets from Inea, ERTICO, ITS Observatory, etc.

In the last month, BONVOYAGE tweets earned an average of 25 impressions per day.

4 BONVOYAGE dissemination activities

4.1 Talks at international events

1. European Working Group on Transportation

The main target of the EWGT 2015 is providing a forum to share information and experiences of research activities, encouraging joint research and the development both of theoretical methods and applications. Primary field of interest concerns OR methods, mathematical models, and computation algorithms to solve and support the solution of problems faced by public administrations, city authorities, public transport companies, service providers, logistic operators and so on. Leonardo Lamorgese from SINTEF attended the annual meeting of the Working Group.

2. Sixth Cargese Workshop on Combinatorial Optimization

The 2015 conference was entitled "Fast Algorithms", namely algorithms capable to find, deterministic or with high probability, optimal or approximated solutions to some optimization problems on large networks. Due to the very nature of BONVOYAGE, this conference was the perfect context to present the project which aims at solving complicated routing problems on a gigantic network (Europe level), in real time. Carlo Mannino from SINTEF presented BONVOYAGE in the "Open Problem" session.

3. ITS World Congress 2015 Bordeaux

The ITS World Congress is an annual international conference focused on Intelligent Transport Systems. Each year, the World Congress is hosted in one of three regions; Europe, Asia-Pacific, and the Americas. The regional ITS associations, ERTICO – ITS Europe, ITS Asia-Pacific and ITS America, each host the World Congress when it falls in their respective region every three years. The ITS World Congress 2015 was held in Bordeaux and Michael Kieslinger from FLUIDTIME presented the BONVOYAGE Project.

4. MatchFest at CES – Las Vegas NV, January 4 – 5, 2016

Prof. Nicola Blefari Melazzi from CNIT presented the OpenGeoBase platform under development in BONVOYAGE. CES is a Business-to-Business Matchmaking event which organises speed meetings between "Born Global" start-ups and international SMEs and potential strategic partners and investors from US and global market as well.

5. Dagstuhl Seminar 16171 "Algorithmic Methods for Optimization in Public Transport" – Wadern, Germany, 24 – 29 April 2016,

The Dagstuhl Seminar brings together researchers from algorithm engineering, operations research, and combinatorial, stochastic, and robust optimization. Because participation is only by direct invitation from the program committee, the selection of attendees is very careful, and many leading scholars in transport optimization attended the seminar. This makes the seminar a perfect arena to introduce new ideas or projects, 16171 seminar covered topics related to the planning of public transport systems, and to their real-time operational management. The seminar focused on handling large amounts of data, as well as on the application of quantitative models and algorithmic methods for solving the relevant problems in these areas. Carlo Mannino from SINTEF attended the workshop and presented in informal talks the BONVOYAGE project to the other attendees

6. ITS European Congress 2016 – Glasgow, UK, June 6 – 9, 2016

The Congress theme was "Delivering Future Cities Now" co-organized by ERTICO and 5GPPP in Glasgow; CNIT presented the BONVOYAGE project in the frame of the Workshop "5G pushing the limits of innovation in Automotive" focused on Automated Driving. This workshop aimed at providing an insight into the 5G concept, explaining what 5G is about and addressing the specific needs of the automotive sector and what benefit are expected from the 5G networks. Lorenzo Bracciale from CNIT gave the presentation.

7. InnoTrans – Berlin, DE, September 20 - 23, 2016

Trenitalia participation in the conference was aimed to present and discuss themes related to state-of-the-art and innovative features and functionalities of the journey planning tools, with specific focus on multi-modal mobility, through the cooperation among several types of transport operators, increase of customer mobility experience and so on. Therefore, in the Conference also BONVOYAGE Project was presented as an example of innovative project in the field and as one of the innovation initiatives that Trenitalia is carrying out at European level. The Head of Information Systems Department of Trenitalia participated to the meeting.

8. TRA 2018 – Transport Research Arena, Vienna Austria, April 16 – 19, 2018

Prof. Andrea Detti, BONVOYAGE's coordinator will attend as Panelist to the Session INV21: Sustainable Multimodal Door to Door Travel, which focus will be on research and innovation activities related to solutions for passenger needs to support anytime, anywhere door-to-door intermodal journeys.

4.2 International Conferences

BONVOYAGE partners carried out, since the beginning of the project implementation, the publication of 26 conference papers with related presentation, as hereafter reported:

1. MED' 16 – The 24th Mediterranean Conference on Control and Automation, Athens 21 – 24, 2016. "A Future Internet Oriented User Centric Extended Intelligent Transportation System" by S. Canale, A. Di Giorgio, F. Lisi, M. Panfili, L. Ricciardi Celsi, V. Suraci, and F. Delli Priscoli. DOI 10.1109/MED.2016.7535967
2. IEEE INFOCOM, San Francisco, CA, April 2016. Detti, B. Ricci, N. Blefari Melazzi. "Tracker-assisted rate adaptation for MPEG DASH live streaming". DOI 10.1109/INFOCOM.2016.7524620
3. North Atlantic Treaty Organisation (NATO), Science and Technology Organisation, Specialists' Meeting – SET- 222, on "Swarm Centric Solutions for Intelligent Sensor Networks", Rome, Italy, 07-08 June 2016 (invited paper). Nicola Blefari Melazzi "Information Centric Networking: a model for an improved Internet (and mobile/ad hoc networks)"
4. SMC2016 IEEE International Conference on Systems, Man, and Cybernetics, October 9-12, 2016. Simon Ollander, Christelle Godin, Sylvie Charbonnier and Aurélie Campagne. *"A Comparison of Wearable and Stationary Sensors for Stress Detection"*
5. PhyCS 2016 – 3rd International Conference on Physiological Computing Systems, 27th and 28th July 2016, Lisbon, Portugal. Simon Ollander, Christelle Godin, Sylvie Charbonnier and Aurélie Campagne. "Feature and Sensor Selection for Detection of Driver Stress". DOI 10.5220/0005973901150122
6. Proc. of IEEE International Forum on Research and Technologies for Society and Industry Leveraging a better tomorrow (RTSI), Bologna, Italy, September 2016. P. Boccadoro, M. Barile, G. Piro, and L. A. Grieco "Energy consumption analysis of TSCH-enabled platforms for the Industrial-IoT"
7. IEEE Globecom 2016, Workshop on Information Centric Networking Solutions for Real World Applications, 4-8 December 2016, Washington, DC USA. Andrea Detti, Nicola Blefari

Melazzi, Michele Orru, Riccardo Paolillo, Giulio Rossi: "OpenGeoBase: Information Centric Networking meets Spatial Database applications".

8. The Third International Workshop on The Emerging Future Internet and Network Security (EFINS 2016) in conjunction with Trustcom 2016, 23 – 26 August 2016, Tianjin, China. Salvatore Signorello, Maria Rita Palattella, Luigi Alfredo Grieco: "Security Challenges in future NDN-Enabled VANETs".
9. 19th International Conference on Intelligent Transportation Systems – IEEE ITSC 2016, Accepted Paper, 1 – 4 November 2016, Rio de Janeiro, Brazil. Lorintiu Oana, Vassilev Andrea: "Transportation mode recognition based on smartphone embedded sensors for carbon footprint estimation".
10. 27th Scientific Meeting Italian Association of Engineering Management – RSA AiIG 2016, Accepted Paper, 13 – 14 October 2016, Bergamo, Italy. Tiziana D'Alfonso from CRAT presented the scientific contribution *Avenali A., Bracaglia V., D'Alfonso T., Reverberi P.:* "Revenue sharing mechanisms for airline-High Speed Rail cooperation under congested hubs".
11. 8th International Congress on Transportation Research – Accepted Paper, 27-29 September 2017, Thessaloniki, Greece. Gaël Vila, Simon Ollander, Christelle Godin, Etienne Labyt, Sylvie Charbonnier, Aurélie Campagne: "Real time monitoring of traveller's psychological stress".
12. IEEE International Conference on Communications 2017 – Proc. of IEEE ICC 2017, 21-25 May 2017, Paris, France. Mu Wang, Changqiao Xu, Shijie Jia, Jianfeng Guan, and Luigi Alfredo Grieco: "Preference-aware fast interest forwarding for video streaming in information-centric vanets".
13. IEEE ICC 2017 – 2nd Convergent Internet of Things (C-IoT) Workshop – 21-25 May 2017, Paris, France. S. Sicari, A. Rizzardi, L. A. Grieco, and A. Coen-Porisini: "A secure ICN-IoT architecture".
14. 2016 Kuhmo NECTAR conference on Transportation Economics ITEA - 15th-17th June 2016, Santiago De Chile, Chile. *C. Jiang, T. D'Alfonso, Y. Wan: "Market Structure and Partnership* Levels in Air-*Rail Cooperation"*

15. IEEE LANMAN 2017: the 23rd IEEE international Symposium on Local and Metropolitan Area Networks – 12th -14th June 2017, Osaka, Japan. Andrea Detti, Michele Orru, Riccardo Paolillo, Giulio Rossi, Pierpaolo Loreti, Lorenzo Bracciale, Nicola Blefari Melazzi: "Application of Information Centric Networking to NoSQL Databases: the Spatio-Temporal use case".
16. IEEE LANMAN 2017: the 23rd IEEE international Symposium on Local and Metropolitan Area Networks – 12th -14th June 2017, M. Orru, R. Paolillo, A. Detti, G. Rossi, N. Blefari Melazzi, "Demonstration of OpenGeoBase: the ICN NoSQL spatio-temporal database"
17. MED 2017 – 25th Mediterranean Conference on Control and Automation, La Valletta, Malta, 3 – 6 July 2017 L. Ricciardi Celsi, A. Di Giorgio, R. Gambuti, A. Tortorelli, F. Delli Priscoli: *"On the Many*-to-Many Carpooling Problem in the Context of Multi-*Modal Trip Planning"*
18. IEEE AVSS 2017: 14th IEEE International Conference on Advanced Video and Signal-Based Surveillance. 29th August 2017, Lecce, Italy. Agnese V. Ventrella, Giuseppe Piro, and Luigi Alfredo Grieco: *"Information*-Centric Networking in Environmental Monitoring: an overview on publish-subscribe implem*entations"*, Proc. of IEEE International Workshop on Intelligent Technologies for Environmental Monitoring (in conjunction with AVSS 2017).
19. SOLI 2017: IEEE International Conference on Service Operations and Logistics. 18th – 20th September 2017, Bari Italy. Agnese V. Ventrella, Giuseppe Piro, and Luigi Alfredo Grieco: *"Information*-centric publish-*subscribe mechanisms for Intelligent Transportation Systems"*, Proc. of IEEE International Workshop on IoT applications in Intelligent Transportation Systems and Logistics (conjunction with the SOLI 2017).
20. 2017 Tyrrhenian International Workshop on Digital Communications. 18-20 September 2017 – Mondello (Palermo), Italy. Giuseppe Piro, Giuseppe Ribezzo, Luigi Alfredo Grieco, and Nicola Blefari-Melazzi: *"A de*-verticalizing middleware for IoT systems based on Information Centric Networking design*"*, Proc. of Tyrrhenian Workshop 2017: Towards A Smart And Secure Future Internet.
21. IABE Conference – International Academy of Business and Economics, July 2017. Avenali, *A., Bracaglia, V., D'Alfonso, T., Reverberi, P.: "Incentives to airline*-high speed rail cooperation *under hub congestion: an antitrust perspective"*, Proceedings of 2017 International Association of Business and Economics (IABE) Conference.

22. 8th International Congress on Transportation Research – ICTR 2017, 27-29 September – Thessaloniki, Greece. Gaël Vila, Simon Ollander, Christelle Godin, Etienne Labyt, Sylvie Charbonnier, Aurélie Campagne: *"Real time monitoring of traveller's psychological stress"*.
23. Multidisciplinary International Scheduling Conference: Theory & Applications – MISTA 2017, 5-8 December 2017 – Kuala Lumpur, Malaysia. Lukas Bach, Dag Kjenstad, Carlo Mannino: *"Orchestrator" approach to multimodal continental trip planning.*
24. IEEE International Conference on Communications – ICC 2018, 20-24 May 2018 – Kansas City, MO, Usa. Piero Boccadoro, Giuseppe Piro, Domenico Striccoli, Luigi Alfredo Grieco: *"Experimental comparison of Industrial Internet of Things protocol stacks in Time Slotted Channel Hopping scenarios".*
25. Information Centric Networking Solutions for Real World Applications (ICN-SRA), IEEE ICC 2018, 20-24 May 2018 – Kansas City, MO, Usa. Mauro Losciale, Pietro Boccadoro, Giuseppe Piro, Giuseppe Ribezzo, Luigi Alfredo Grieco, Nicola Blefari-*Melazzi: "A novel ICN*-based *communication bus for Intelligent Transportation Systems".*
26. European Wireless 2018, Catania, Italy, 02 – 04 May 2018. Pietro Boccadoro, Mauro Losciale, Giuseppe Piro, Luigi Alfredo Grieco: *"A standard*-compliant and information-*centric communication platform for the Internet of Drones".*

4.3 Journals

The following 10 journal papers have been published in the project:

1. "Diameter Constrained Overlays with Faulty Links: Equilibrium, Stability, and Upper Bounds", L. A. Grieco et al. IEEE Trans. on Circuits and Systems II, December 2015.
2. "Understanding the Social impact of ICN: between myth and reality" G. Piro, S. Signorello, M. R. Palattella, L. A. Grieco, G. J. Boggia, and T. Engel. AI & Society: Journal of Knowledge, Culture and Communication, Springer, 2016
3. "Gazing into the crystal ball: when the Future Internet meets the Mobile Clouds", G Piro, M. Amadeo, G. Boggia, C. Campolo, Grieco L. A., A. Molinaro, and G. Ruggeri. IEEE Transactions on Cloud Computing, 2016.

4. "Link-layer Security in TSCH networks: effect on slot duration" S. Sciancalepore, M. Vucinic, G. Piro, G. Boggia, and T. Watteyne, Transactions on Emerging Telecommunications Technologies (ETT), June 2016
5. "Air transport and high speed rail competition: environmental implications and mitigation strategies ", D'Alfonso T., Jiang C., Bracaglia V. Transportation Research Part A: Policy and Practice, 92, 261-276.
6. "Air-Rail Cooperation: Partnership Level, Market Structure and Welfare Implications" C. *Jiang, T. D'Alfonso, Y. Wan*, Transportation Research Part B: Methodological doi: 10.1016/j.trb.2017.01.006
7. "Industrial Internet of Things at work: a case study analysis in Robotic-aided environmental monitoring", Scilimati, A. Petitti, P. Boccadoro, R. Colella, D. Di Paola, A. Milella, and L. A. Grieco IET Wireless Sensor Systems, 2017
8. "Publish-subscribe in mobile information centric networks: modeling and performance evaluation", A. V. Ventrella, G. Piro, and L. A. Grieco Computer Networks (Elsevier), 2017.
9. "Optimal Information Centric Caching in 5G Device-to-Device Communications"Changqiao Xu, Mu Wang, Xingyan Chen, Lujie Zhong, Luigi Alfredo Grieco.IEEE Transactions on Mobile Computing, 2018.
10. "Modeling LRU cache with invalidation", A. Detti, L. Bracciale, P. Loreti, N. Blefari Melazzi. Elsevier Computer Networks, Vol. 134, P. 55-65, Issn: 1389-1286, Doi: 10.1016/J.Comnet.2018.01.029

4.4 Collaboration with ITS Cluster, Related project and External Collaboration

ITS Cluster

CNIT participated to the activities of the H2020 ITS Coordinator Cluster, whose workshops have been held in Brussels, in November 2015, December 2016 and December 2017 at INEA premises. The cluster has created synergies with other EU Projects forming the Open Data Work Group of the H2020 ITS Cluster, namely: ITS Observatory, EuTravel and MASAI. The scope of the Open Data WG is to support the sharing of data sources among the project of the H2020 ITS Clusters. The role of the BONVOYAGE project is both to share its data and to offer a common data-sharing platform based on ICN technology.

During the first meeting (Nov. 2015), Andrea Detti (CNIT) mainly presented the initial vision of the project and agreed on possible synergy with other projects.

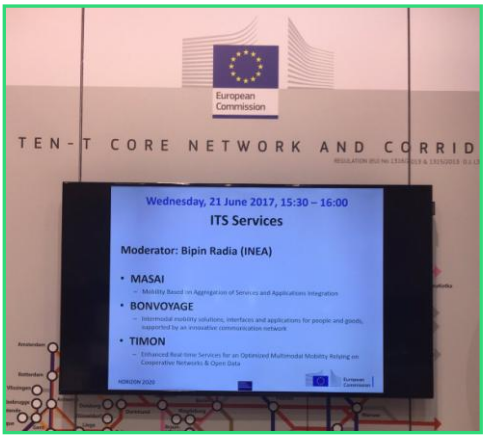
In the second meeting (Dec. 2016), Andrea Detti (CNIT) reported to the other projects the possibility for BONVOYAGE to support a common repository of ITS data and services based on OpenGeoBase, the BONVOYAGE federated National Access Point platform.

Figure 26 – Second ITS Coordinators workshop

During the third (and last meeting for the project) meeting Andrea Detti (CNIT) presentation was focused on the concept of "European federated Platform" as the BONVOYAGE's approach to European ITS and harmonization of the EU Directive 2010/40/EU and National Access Points.

Figure 27 – Third ITS Coordinators Workshop

Within the framework of the collaboration with the ITS cluster, Giuseppe Tropea (CNIT) represented BONVOYAGE at the ITS CONGRESS 2017 - PANEL "ITS SERVICES" – STRASBOURG FRANCE, JUNE 19 – 22, 2017. The project has been hosted at the EU booth and it has been part of a live panel focused on ITS Services, which was participated by two other projects of the ITS Cluster (TIMON and MASAI) and by EU representatives. The panel was accurately planned during several weeks in advance, by means of conference calls and exchange of ideas, and a joint set of slides was crafted in order to better communicate the goals of ITS Services and the specific advancements set forward by the three projects and by their interaction. Here below some pictures of the event are reported.



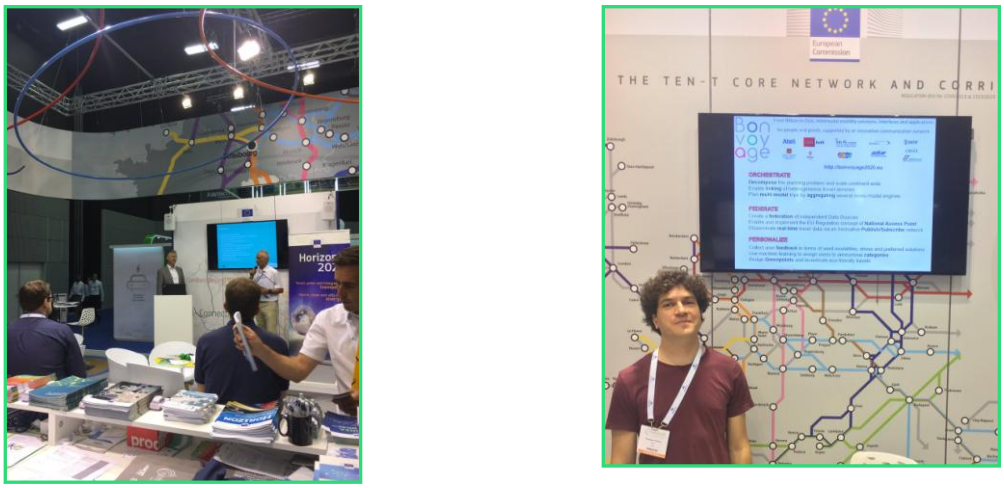


Figure 28 – BONVOYAGE at the ITS Congress 2017

Collaboration with CODEC project

Since the beginning of the projects, BONVOYAGE and CODECS shared mutually information and links on the respective Web Sites. A CODECS's newsletter dedicated to BONVOYAGE objectives and results has been published.

Intermodal mobility solutions, interfaces and applications for people and goods, supported by an innovative communication network

Project coordinator: Prof. Nicola Blefari Melazzi, CNIT, Univ. Rome "Tor Vergata", Italy, blefari@uniroma2.it

www.bonvoyage2020.eu

At a glance

The aim of BONVOYAGE is twofold: for the end-users, to **provide the best information to go from a place to another, before and during the travel**, door to door, by using any combination of any transport means, both for people and goods, taking into account real-time conditions and user preferences; for the EU and ITS community, **to provide a federated architecture able to cluster planning services and data sources**, exploiting the functionality of an innovative information-centric network.

Fig.1 describes the BONVOYAGE architecture. We have *Clients* that use a multimodal journey planning application supported by an *Application Server*. The Application Server uses a federated architecture formed by: a set of *Planning Services*, i.e. route resolvers, *Data Sources*, and *National Access Points*. Both data and services refer to a given geographical area (e.g. a country) and given transport modes (e.g., car+bus, plain+train, car sharing, etc…). Planning Services and Data Sources are discovered through a *Discovery Service* offered by the National Access Points.

Innovation to the ITS community and EU

The European Community is acknowledging the difficulties arising from a strictly centralized solution to the problem of continent-wide future-proof ITSs. The Directive 2010/40/EU establishes a legal framework for developing specifications to make ITS interoperable across borders: its priority actions (b), (c) and (e) require the setting up of a single National Access Point (NAP) and its associated "discovery/search and browse" functionality, by each Member State. BONVOYAGE provides a federated architecture enabling the integration of data sources and planning services, **matching the EU directive**. Thus, BONVOYAGE constitutes a **global platform for the ITS community** where orchestration of data and planners makes possible to easily setup novel multimodal journey planning applications (Fig. 1). BONVOYAGE implements the federated architecture in its key components: a discovery service, some focused planning services and novel data sources.

Through the **discovery service** authorized users can publish georeferenced information related to their data or planners to make them discoverable, and they can retrieve all information available in an area, which is needed to plan an optimal multimodal trip. Information retrieval can be carried out also in deferred way, subscribing interest on events that occur in given areas, e.g. a new planner or source of information is made available or traffic conditions change. The discovery service is based on a novel spatial database, named OpenGeoBase, which exploits Internames, an Information Centric Network (ICN). In our vision the National Access Points become the access points of OpenGeoBase. Each country can autonomously manage its own OpenGeoBase servers while being part of a global federated system.

BONVOYAGE offers **a set of planning services** exposing a common interface. The project provides three specialized planners: a multimodal planner able to route people based on real-time conditions, where the plan is continuously updated with new estimates, delays and other incidences; a planner specialized for car sharing and another planner specialized for goods.

BONVOYAGE also deals with novel forms of **data sources based on wearable sensors**, which measure real-time behaviour of a traveller to assess her stress level or her mode of transport (driving, walking, cycling, etc…).

Clearly the BONVOYAGE architecture can federate a variety of novel planning services and data sources including the ones developed by other European projects.

Innovation to the end-user

Nowadays, the number of multimodal journey planning applications is still very limited, albeit their undeniable usefulness. Two issues that limit the development of such applications are: the complexity of multimodal planning algorithms and the practical difficulties of retrieving massive ITS data. The BONVOYAGE federated architecture enables developers to easily overcome these impairments, simply orchestrating data or planning services provided by others, so **fostering the diffusion multimodal journey planning applications**.

In addition, BONVOYAGE provides its own **multimodal journey planner applications for people and goods,** which exploits the federated architecture and takes into account specific, **user-profile-based travel preferences** in order to drive multiobjective optimization algorithms, **which communicates with the user both before and during travel**. For instance, before the travel starts a user can be notified if some segment of the planned trip must be changed due to a temporarily cancelled bus stop. Similarly, real-time events are taken into account and notified during the trip. The application exploits a User Profiler Tool whose key difference with state-of-the-art solutions consists in the **automatic learning of user preferences from the user behaviour**. Moreover, crowd-sourced data coming from users is used to optimize travel planning. It comes from two main sources: sensors embedded in the smartphone, wearable sensors (connected watch, wristband, jacket, etc.). This information can be included in the user profile and used by the application to preferentially propose the transport modes with lower stress level, which improves user's well-being during her travels.

Figure 1 – BONVOYAGE at a glance

FIGURE 29 – Codecs Newsletter about BONVOYAGE

Collaboration with EuTravel project

Interesting synergies have been established between BONVOYAGE and EuTravel Projects thanks to TRENITALIA. EuTravel project (coordinated by Inlecom) aims at contributing towards the realization of a sustainable and open single European market for mobility services. The similarity and consequently the exploitable synergies between BONVOYAGE and EuTravel have been pointed out in the Working Group meeting held in Rome on 26th June 2015. Thanks to the involvement of Trenitalia in both projects, the related research teams will design common use-cases scenarios to be tested in both solutions. Several meetings saw synergies deployed, including:

- BONVOYAGE – EuTravel joint meeting (Rome, IT, June 25, 2015) - The meeting was aimed to analyse and discuss about possible links and synergies among BONVOYAGE and EuTravel projects, where Trenitalia is an active partner. Other partner organisations from BONVOYAGE (CNIT) and EuTravel (INLECOM, eBOS) took part in the meeting.

- EuTravel project meeting (Athens, Greece, February 9 - 10, 2016) - The meeting represents a periodic technical meeting of EuTravel project, where Trenitalia is involved as

partner. The meeting Agenda included a dedicated slot to discuss possible liaisons with other EU funded projects. BONVOYAGE was presented as suitable liaison project to find synergies with.

Collaboration with Hope Project

The BONVOYAGE project has been invited in Brussels by the HoPE EC Project Consortium to attend to its final conference "The Next Generation of Route Planners" (Brussels, Belgium, May 9, 2017). The event represented the final meeting of the project and created a valuable occasion to exchange information, ideas, and experiences in the area of multimodal route planning and integrated fare management and a great opportunity to exploit the BONVOYAGE results and achievement. Dag Kjenstad from SINTEF presented BONOVOYAGE Project and its distributed approach on intermodal route planning to a European-wide network of stakeholders such as fellow cities, transport operators, public sector, private companies, universities, and local as well as European projects).

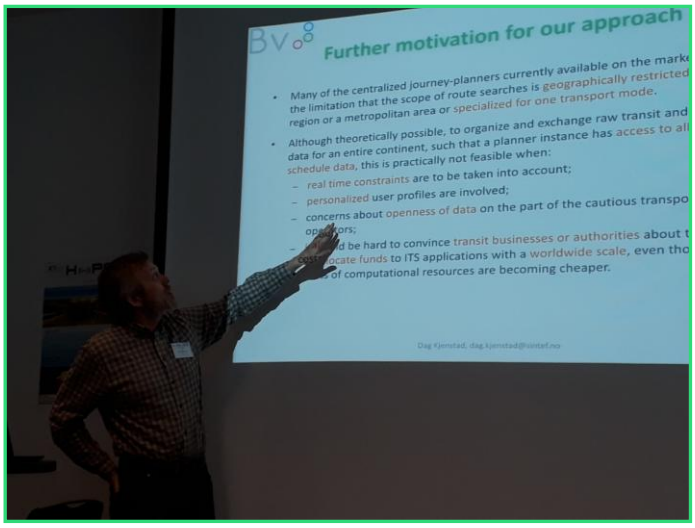


Figure 30 - Dag Kjenstad from SINTEF at the HOPE Conference

4.5 Industrial Events and Stakeholders engagement

Trenitalia and SAP Executive Summit

On 29th September 2016, CNIT (prof. Nicola Blefari Melazzi) participated at the event "Trenitalia and SAP Executive Summit" thanks to the invitation by TRIT. The event was focused on showcasing the innovation undertaken by Trenitalia within IoT domain. Main guest of the event were the SAP

CEO Bill McDermott. The event was an occasion to present BONVOYAGE project and its main application in the ITS domain.

CISCO Networking Innovation & Research Symposium

On 21th and 21st March 2017, CNIT (Andrea Detti) presented BONVOYAGE at the 2nd Annual Networking Innovation & Research Symposium organised by Ecole Polytechnique and Cisco's Paris Innovation and Research Lab (PIRL). BONVOYAGE was presented in the 20th morning session focused on "ICN, THE NETWORK FOR 5G" and chaired by Dr. Giovanna Carofiglio from Cisco.

Figure 31 – Andrea Detti from CNIT at CISCO

Trondheim City Council's Tender

In March 2017, Fluidtime participated to a public tender of the Trondheim City Council (Norway) for the involvement in a test phase of a MaaS Pilot. The technical offer of FLUIDTIME was based on the mayor BONVOYAGE achievements.

Freight Stakeholders in Basque Country

The BONVOYAGE project has been presented by MLC in face to face meetings to freight related stakeholders in the Basque Country such as infrastructure managers (Port Authorities and Logistic Platforms) and logistics operators at urban/interurban and long distance level with the aim of investigating how to deal with freight transport requirements, data availability and formats to better understand the complexities of the logistic of goods and promote BONVOYAGE concept.

The Commission Delegated Regulation No. 885/2013 supplementing ITS Directive 2010/40/EU in Article 5 states "Public or private parking operators and service providers shall share and exchange

data on safe and secure parking areas describing the parking facility using DATEX II format". In that respect during the project MLC has collected information related to safe truck parking areas in the Basque Country to make this information available in the European Access Point for Truck Parking Data managed by the Commission.

4.6 Fairs and public events

1. International Association of Public Transport – UITP Milan 2015

   The BONVOYAGE Partner FLUIDTIME attended the International symposium and gave a presentation about BONVOYAGE objectives and scope. The biennial UITP World Congress and Exhibition offers participants a unique opportunity to discover the public transport market developments and learn from industry leaders.

2. INEA H2020 ITS Cluster Workshop – Brussels Belgium, November 6, 2015

   The Meeting created synergies with other EU Projects forming the Open Data Work Group of the H2020 ITS Cluster, namely: ITS Observatory, EuTravel and MASAI. The scope of the Open Data WG is to support the sharing of data sources among the project of the H2020 ITS Clusters. The role of the BONVOYAGE project is both to share its data and to offer a common data-sharing platform based on ICN technology. Andrea Detti from CNIT attended the meeting and gave a presentation.

3. CeBIT Global Conference 2016 – Hannover, Germany, March 14 – 18, 2016

   CeBIT is the largest and most internationally represented computer expo. The trade fair is held each year on the Hanover fairground, the world's largest fairground, in Hanover, Germany. It is considered a barometer of current trends and a measure of the state of the art in information technology.
   Roman Pickl from FLUIDTIME presented the BONVOYAGE project. Special Dissemination has been performed on BONVOYAGE Twitter channel.

FIGURE 32 – Picture of the Web site exhibition at CeBIT by FLUIDTIME

FIGURE 33 – ***FLUIDTIME's Booth at CeBIT***

4. Third International Conference on Physiological Computing Systems – PhyCS 2016, July 28 – 29, 2016

PhyCS is the annual meeting of the physiological interaction and computing community, and serves as the main international forum for engineers, computer scientists and health professionals, interested in outstanding research and development that bridges the gap between physiological data handling and human-computer interaction. This meeting includes a specific place to European projects including research on this topic. CEA Leti presented BONVOYAGE Project, thanks to its research on user stress level assessment and its use in

traveller profiling, optimization of travel solution and real time on trip assistance. CEA Leti also exposed the Project Poster as described in section 3.5. A dedicated News has been published via the BONVOYAGE web site.

5. AUTOMATICA 2016 – Rome, Italy, 5 – 7 September 2016

On September 5th-7th, 2016, the conference Automatica.it (http://sidra2016.dia.uniroma3.it/) took place in Roma. The event hosted the annual meeting of Professors and Researchers from several Universities, Research Centers, and Industries active in the field of Automatic Control. In this moment of scientific exchange and aggregation, Francesco Delli Priscoli, Alessandro Di Giorgio, Antonio Pietrabissa and Lorenzo Ricciardi Celsi from CRAT presented the BONVOYAGE project, the BONVOYAGE platform architecture and the innovative activities carried out in the project, with particular attention to WP2 and WP4. The rationale behind the design of the User Profiling Tool, the Multi-Objective Optimization Tool and the Car Pooling algorithms have been illustrated by means of a poster (see next Figure).

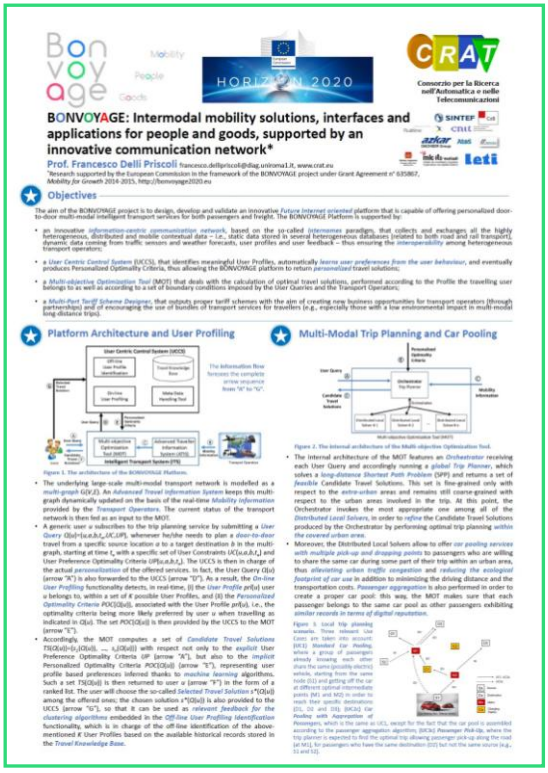


Figure 34 – ***CRAT's poster presented at AUTOMATICA 2016***

6. INEA H2020 ITS Cluster Second Workshop – Brussels Belgium, December 14, 2016

   CNIT participated in the second H2020 ITS workshop in which the possibility for BONVOYAGE to support a common repository of ITS data and services based on OpenGeoBase was discussed.

7. 1st European Conference on Connected and Automated Driving (CAD) - Brussels Belgium, April 3-4, 2017

   Major road transport stakeholders – automotive and telecom industry, users, road operators, public transport operators, regulators, research centres, universities and representatives of both EC and EU Member States – attended this meeting.

   The event has been an opportunity to discuss on how to boost the development and deployment of connected and automated driving technologies from a fourfold perspective: transport policy issues; technological challenges; legal and regulatory frame, and digital transformation. BONVOYAGE has been cited as one example of project contributing to this development and deployment actions.

8. ITS Congress 2017 - Panel "ITS Services" – Strasbourg France, June 19 – 22, 2017

   In occasion of the ITS Congress 2017, CEA organised its own Booth and presented BONVOYAGE project with the preparation of two thematic flyers and by performing a demo of algorithms and related Apps dedicated to implicit feedbacks functionalities (transport mode recognition and stress level monitoring) used for smart travel planning and on-trip assistance in BONVOYAGE Project.

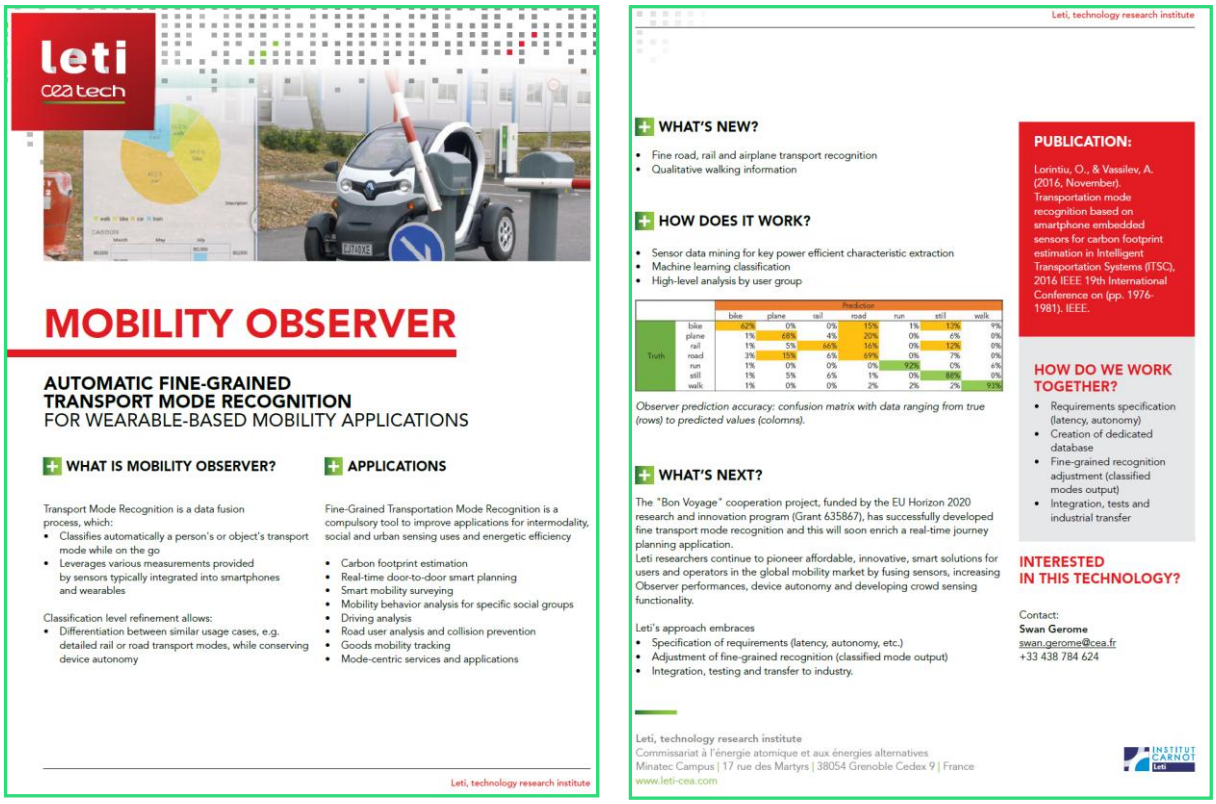


FIGURE 35 – ***CEA's flyer*** on Mobility Observer

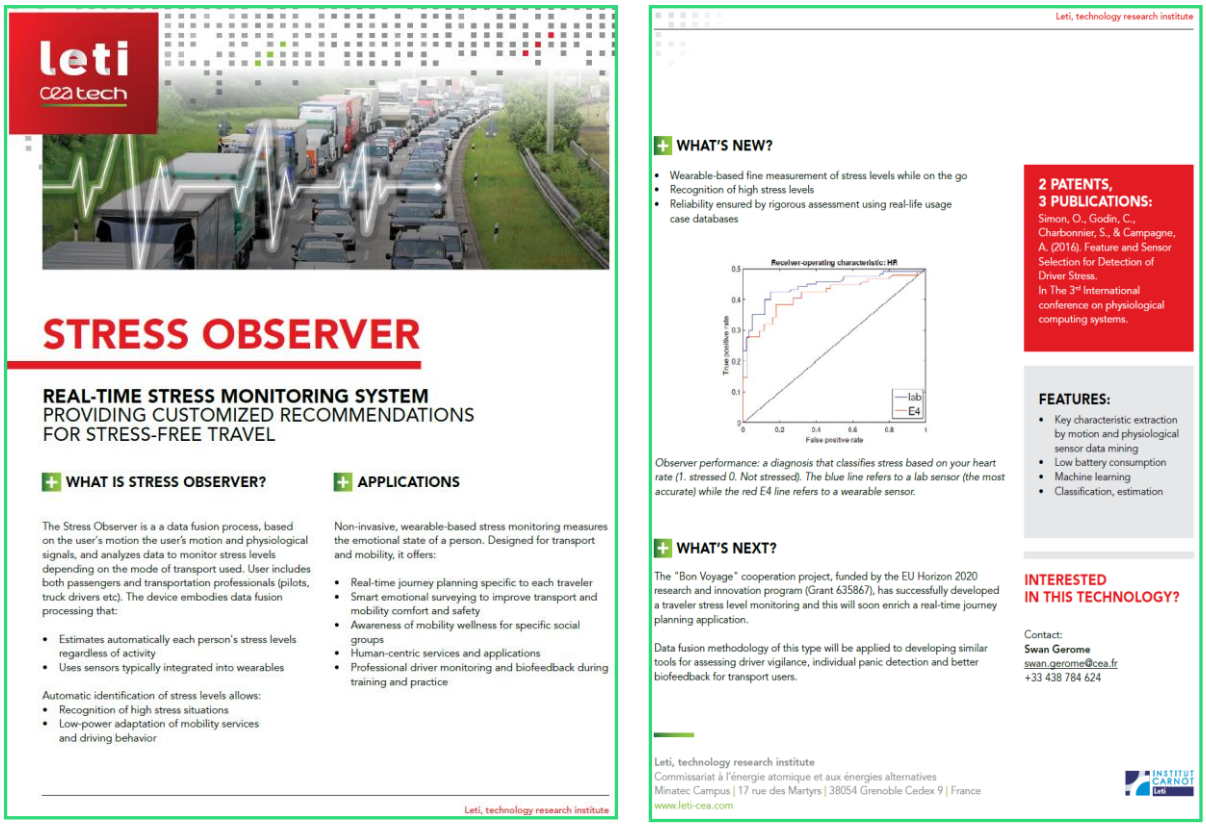


Figure 36 – ***CEA's f***lyer on Stress Observer

9. Innovago – Bilbao Spain, June 19, 2017

Innovago was an innovation workshop organized by the cluster of Mobility and Logistics of the Basque Country on the 19th of June 2017 in Bilbao. This workshop brought together a group of mobility related stakeholders of the Basque Country:

- Public Authorities: Transport Authority of Gipuzkoa Province, Transport Authority of Bizkaia Province, Transport Department of the Basque Government.
- Mobility services providers: MKZ (car-sharing service provider), Gertek, Ingartek.
- Research and Academy: Tecnalia; University of the Basque Country; Deustotech.

Main focus of the meeting was to discuss about data formats and standards for public transport, the NAP (National Access Points) concept established in the EU 2010/40 directive, multimodal mobility services. In this context BONVOYAGE was presented as a project dealing with these topics. In this session BONVOYAGE dissemination material was used (poster) and distributed (brochure)

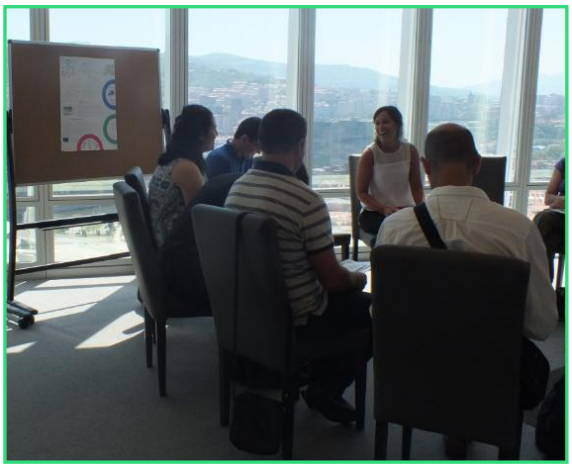



Figure 37 – Innovago event in Bilbao City Council

10. ITSWC 2017 – ITS World Congress 2017, Montreal Canada, 29 October – 2 November 2017

Roman Pickl from FLUIDTIME attended the ITS World Congress in Montreal giving a speech at SIS114 – Mobility as a Service: New Business and Service Approaches about Enabling the MaaS ecosystem. Mobility as a Service solutions will put users at the heart of the transport network, offering tailor-made travel services based on their preferences. MaaS has the potential to become the mobility service of choice for future generations, disrupting the traditional link between mobility and vehicle ownership. It will provide the means to achieve the smarter, simplified transportation landscape envisioned and expected by future users. This session examined the current status of development and deployment as well as the different approaches being applied. The discussion dealt also with the industry, city, and regional perspectives of MaaS as well as focused on developments in business, service, and policy aspects of this trending topic and the partnerships that are delivering them. BONVOYAGE project was presented as part of a slideshow showing H2020 projects at the European Commission Booth.

Figure 38 – ***EC booth's slideshow on BONVOYAGE***

11. The Norwegian Ministry of Transportation and Communication

In 2017, Ketil Solvik-Olsen, The Norwegian Minister of Transportation and Communication, established a Mobility and Technology Council consisting of leaders within business, industry and research and transport sector. On April 5th, 2018 the minister and the council visited the AI-Laboratory in Trondheim. Here Dag Kjenstad from SINTEF presented the BONVOYAGE project under the title "The Future of Travel Planning". A key message from this presentation was how BONVOYAGE can organize today's fragmented services info a distributed, but seamless, interoperable, scalable and fully intermodal platform.

4.7 Education and Academic dissemination activities

In occasion of the Open Day at DIAG (9th March 2016, Department of Computer, Control, and Management Engineering "Antonio Ruberti" at Sapienza University of Rome), CRAT team presented the BONVOYAGE project by illustrating the aims of the project as well as a short demo about personalization for trip planning services. The title of the presentation was "Personalization of multimodal travel planning services". The event achieved success and interest from students approaching the academic and research offers. A flyer of BONVOYAGE has been distributed among all young participants and a considerable number of them have been selected for filling in the BONVOYAGE Questionnaire by the "Survey" section of the official project web site.

FIGURE 39 – BONVOYAGE presentation at OPEN DIAG 2016 by CRAT

One year later, in the 2017 (9th March), a new Open Day at DIAG (CRAT) has been organised (http://open.diag.uniroma1.it). Silvia Canale, Lorenzo Ricciardi Celsi, Alessio Martino and Raffaele Gambuti presented BONVOYAGE with specific focus on User Centric Intermodal Urban Soloist and showed more extensively one of the demos realized by CRAT, namely the Urban Soloist service including user profiling and car-pooling. Flyers in Italian of the BONOVAGE project have been distributed to the audience (see next Figure).

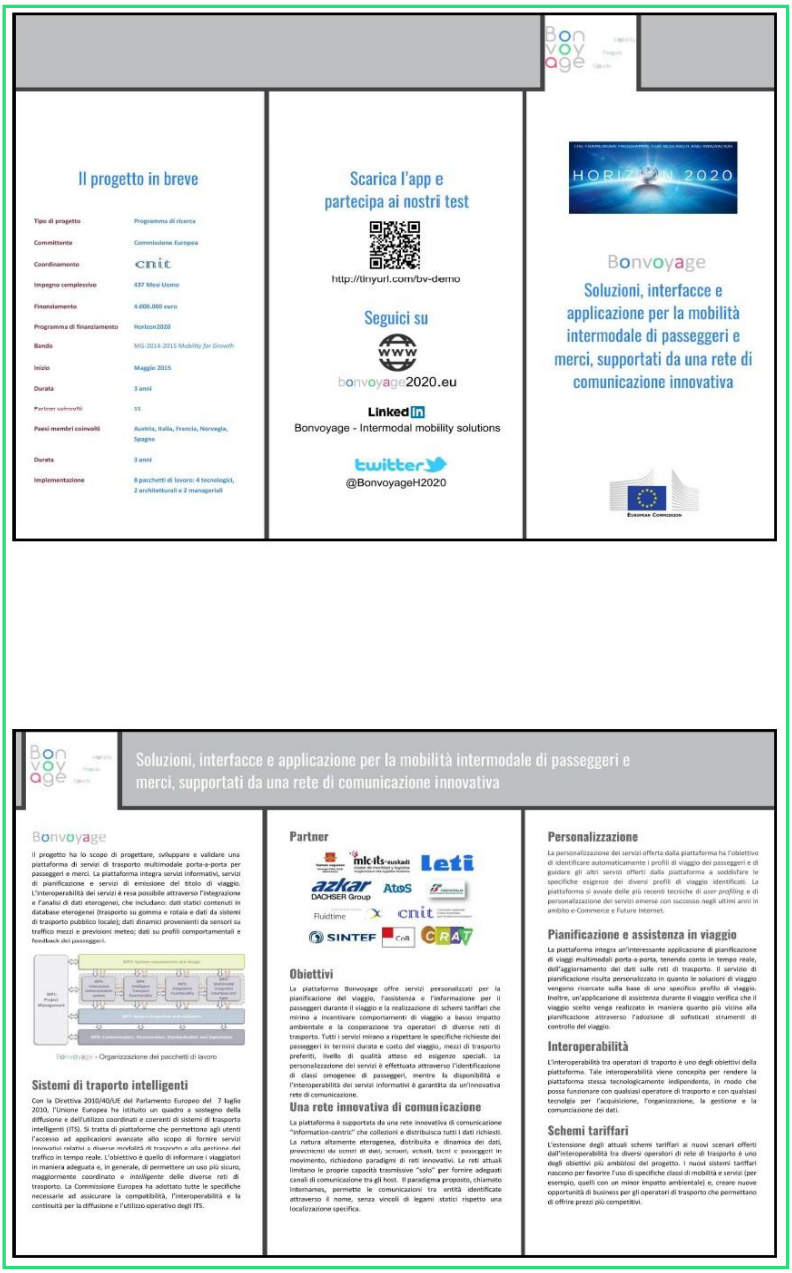


Figure 40 – BONVOYAGE Flyer in Italian Language

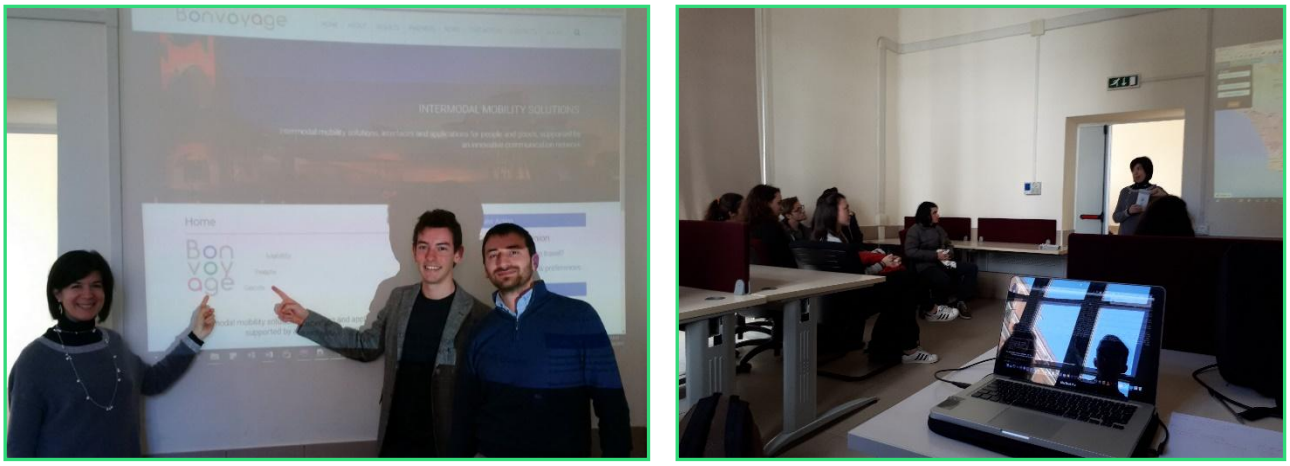


FIGURE 41 - BONVOYAGE presentation at OPEN DIAG 2017 by CRAT

Furthermore, several teaching activities have been performed at the University of Rome "La Sapienza", mainly in the framework of the School of Engineering in Engineering in Computer Science and Control Engineering and of the Master of Sciences in Control Engineering, Communications Engineering and Engineering in Computer Science, concerning the Future Internet (FI) paradigm so as it has been implemented in the BONVOYAGE architecture, the user profiling based service personalization, the control based models and algorithms for trip management and the multi part tariff scheme design. In particular, to date, 20 students have been performing their BSc thesis within the Bachelor of Science in Engineering in Computer Science and Control Engineering; 2 students has been performing his Master of Science Thesis within Master of Science in Communications Engineering; 5 students have been performing their Master of Science Thesis within Master of Science in Control Engineering or Engineering in Computer Science. All of them developed the thesis on the BONVOYAGE architectural, user profiling and trip planning and control aspects. Moreover, part of the contribution given by CRAT in terms of multi modal journey planning and control in Task 4.2 has been included in the PhD thesis "Accurate vehicle positioning and multimodal journey planning for new smart mobility scenarios" submitted by Dr. Raffaele Gambuti on February 2017 within the PhD Programme in “Automatica, Bioengineering and Operations Research” (XXIX cycle) held at “Sapienza” University of Rome.

4.8 Interaction with End Users

General Public and End Users have been involved at this early stage of the project implementation through the survey launched on the BONVOYAGE’s web site on 16th March 2016 till November 2016, namely the BONVOYAGE Questionnaire managed by a software platform provided by CRAT. The survey aims to analyze the travel behavior, whether short or long distance, and the levels of quality of transport services as perceived by users. The ultimate purposes of the analysis are

purely scientific and will guide the BONVOYAGE Consortium in the development of new technologies to improve the multimodal transportation services. The on-line questionnaire is available to date in Italian and English Languages (http://bonvoyage2020.eu/take-action/)

A number of 352 questionnaires have been completed by M17 (September 2016). Further information about the BONVOYAGE Questionnaire can be found in deliverable D4.1 due at M18 (October 2016), see Appendix B.

4.9 Other Publication for General Public

Anton Fitzthum from FLUIDTIME published an article on BONVOYAGE Project on the Magazine "Smart Cities - Speciál 2016 – Chytrá mobilita" issued in Czech language in January 2016. The Article title is: "Integrated Mobility platforms: indispensable for tomorrow's mobility services". Here below we report the images of the article.


Platformy integrované mobility: nutnost pro služby mobility zítřka

Figure 42 – ***Image of the Magazine's article by FLUIDTIME***

CEA's Viviane Cattin released an interview on the web magazine www.industrie-techno.com on the Mobility Observer realised in the frame of BONVOYAGE project. The interview has been published on 26th September 2017 and it is in French language.

Une appli pour mieux gérer le stress du voyageur

www.industrie-techno.com /une-appli-pour-mieux-gerer-le-stress-du-voyageur.50626

Floriane Leclerc

© Teradata

Afin de mieux gérer le stress des voyageurs, les chercheurs du CEA Tech ont mis au point une application capable de déterminer l'état émotionnel de l'usager selon le mode de transport emprunté afin de l'orienter vers celui qui préservera le plus son bien-être.

7h30, le matin. Heure de pointe. La porte du métro vient de se refermer juste sous votre nez. Coincé dans votre compartiment, vous vous demandez si vous n'auriez pas mieux fait d'opter pour le vélo… Afin d'augmenter le bien-être des voyageurs et de les aider à faire le bon choix, le **CEA Tech** a développé une application capable d'identifier automatiquement le mode de transports utilisé et de mesurer le niveau de stress de leurs usagers. Baptisée Mobility Observer, cet outil d'observation, lancé dans le cadre du projet européen Bon voyage, se scinde en deux applications.

Différencier le tram du train

La première, sur smartphone, permet de détecter le mode de transport emprunté en exploitant les capteurs du téléphone. "*On s'est appuyé sur les capteurs les moins consommateurs d'énergie, comme les accéléromètres, les magnétomètres. Voire le GPS ou le Wi-Fi, qu'on retrouve dans n'importe quel smartphone*", explique Viviane Cattin, responsable du laboratoire des signaux et suystèmes de capteurs du CEA Tech. Les données collectées viennent alimenter un algorithme d'apprentissage afin de construire un modèle précis, capable de distinguer le train du métro par exemple. "*Mais cela reste encore relativement compliqué, relève la scientifique. Car ce sont deux modes ferroviaires. La différenciation ne se fera donc pas simplement au niveau des vibrations, mais d'un ensemble de mesures décrivant la dynamique de mouvement. Le tram marquant par exemple plus souvent l'arrêt que le train*". L'équipe cherche encore à établir les 20 paramètres qui permettront de discriminer les différents mode de transport. "*La difficulté, c'est de savoir quelle donnée mettre en entrée de l'algorithme* ".

Montre connectée

En parallèle, une montre connectée comprenant des capteurs de données biologiques mesurera l'état de stress de l'usager au travers d'indicateurs tels que l'activité électrodermale ou la température du corps. Les données des deux applications, une fois corrélées, doivent permettre de planifier le trajet optimum de façon personnalisée et en temps réel. Mais, à la différence des applications existantes qui se concentrent sur le temps de trajet, c'est le bien-être du voyageur qui doit prédominer. "*L'état émotif, le niveau de fatigue... seront pris en compte*", précise la chercheuse.

Aujourd'hui, le dispositif repose sur deux applications. Mais à l'avenir, il pourrait n'y en avoir qu'une seule. Les données collectées sont aujourd'hui stockées dans la montre ou le téléphone, "*l'usager en restera donc propriétaire. Mais il sera toujours possible de les envoyer sur un serveur*", précise Viviane Cattin. Ces données pourraient en effet intéresser les collectivités qui voudraient proposer de nouveaux services de mobilité.

Figure 43 – ***CEA's Inteview on Mobility Observer***

BONVOYAGE project results have being disseminated trough MLC networks and web site.

Announcement of the project activities has been published in the periodic newsletter reaching about 150 contacts, policy makers, industry, research centers and universities.

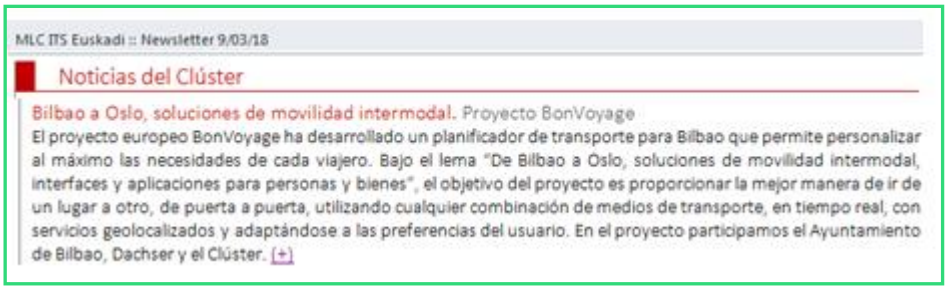
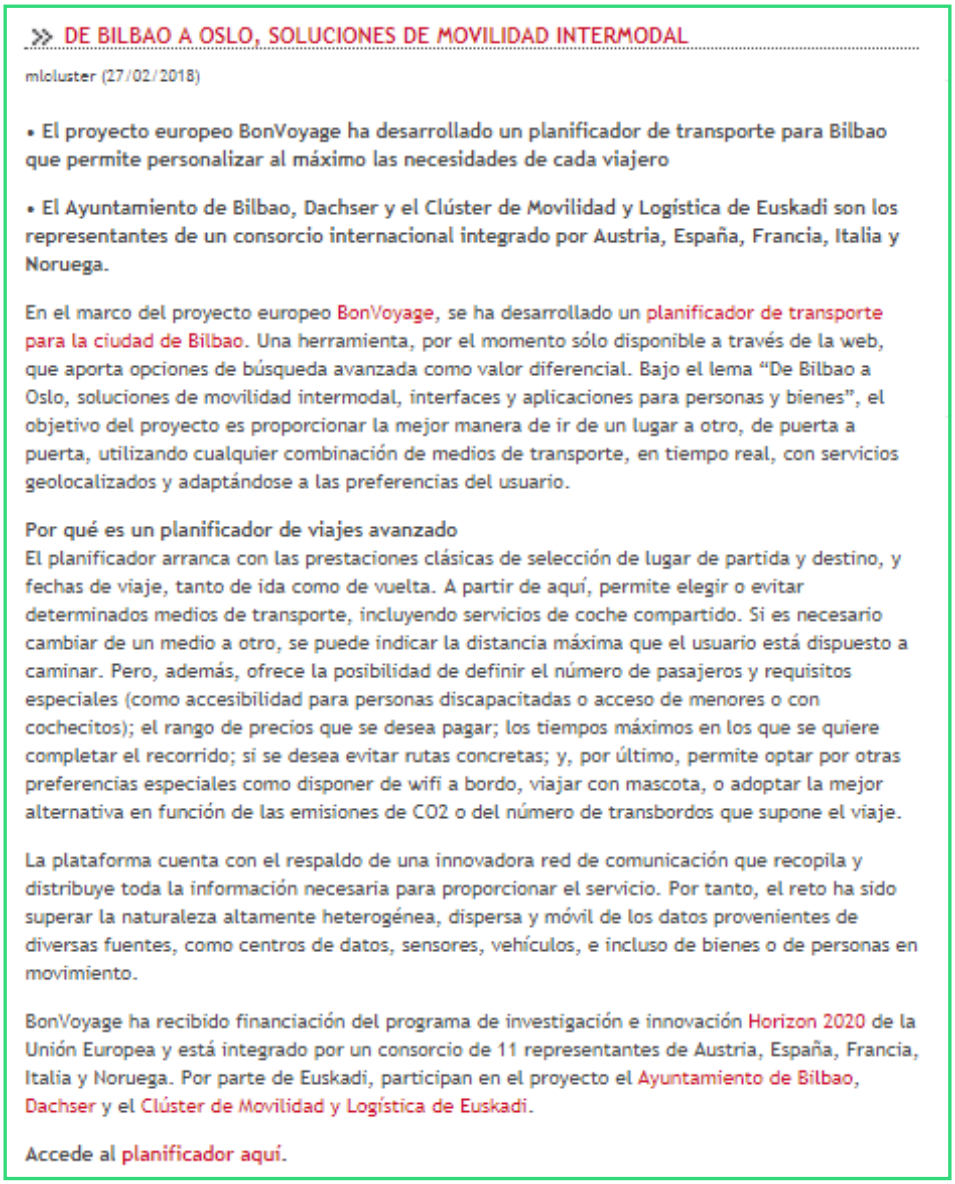


Figure 44 – MLC Newsletter

A Press release has been recently published in the website.



» DE BILBAO A OSLO, SOLUCIONES DE MOVILIDAD INTERMODAL

mlcluster (27/02/2018)

• El proyecto europeo BonVoyage ha desarrollado un planificador de transporte para Bilbao que permite personalizar al máximo las necesidades de cada viajero

• El Ayuntamiento de Bilbao, Dachser y el Clúster de Movilidad y Logística de Euskadi son los representantes de un consorcio internacional integrado por Austria, España, Francia, Italia y Noruega.

En el marco del proyecto europeo BonVoyage, se ha desarrollado un planificador de transporte para la ciudad de Bilbao. Una herramienta, por el momento sólo disponible a través de la web, que aporta opciones de búsqueda avanzada como valor diferencial. Bajo el lema "De Bilbao a Oslo, soluciones de movilidad intermodal, interfaces y aplicaciones para personas y bienes", el objetivo del proyecto es proporcionar la mejor manera de ir de un lugar a otro, de puerta a puerta, utilizando cualquier combinación de medios de transporte, en tiempo real, con servicios geolocalizados y adaptándose a las preferencias del usuario.

Por qué es un planificador de viajes avanzado
El planificador arranca con las prestaciones clásicas de selección de lugar de partida y destino, y fechas de viaje, tanto de ida como de vuelta. A partir de aquí, permite elegir o evitar determinados medios de transporte, incluyendo servicios de coche compartido. Si es necesario cambiar de un medio a otro, se puede indicar la distancia máxima que el usuario está dispuesto a caminar. Pero, además, ofrece la posibilidad de definir el número de pasajeros y requisitos especiales (como accesibilidad para personas discapacitadas o acceso de menores o con cochecitos); el rango de precios que se desea pagar; los tiempos máximos en los que se quiere completar el recorrido; si se desea evitar rutas concretas; y, por último, permite optar por otras preferencias especiales como disponer de wifi a bordo, viajar con mascota, o adoptar la mejor alternativa en función de las emisiones de CO2 o del número de transbordos que supone el viaje.

La plataforma cuenta con el respaldo de una innovadora red de comunicación que recopila y distribuye toda la información necesaria para proporcionar el servicio. Por tanto, el reto ha sido superar la naturaleza altamente heterogénea, dispersa y móvil de los datos provenientes de diversas fuentes, como centros de datos, sensores, vehículos, e incluso de bienes o de personas en movimiento.

BonVoyage ha recibido financiación del programa de investigación e innovación Horizon 2020 de la Unión Europea y está integrado por un consorcio de 11 representantes de Austria, España, Francia, Italia y Noruega. Por parte de Euskadi, participan en el proyecto el Ayuntamiento de Bilbao, Dachser y el Clúster de Movilidad y Logística de Euskadi.

Accede al planificador aquí.

Figure 45 – MLC Press release

The press release aimed to encourage local passengers in testing the Bilbao soloist which is available in the Cluster website.

Figure 46 – Link to BONVOYAGE app for testing soloist

5 Standardization activities

BONVOYAGE's contributed to Internet and Transport Planning related standardization regulation activities as hereafter reported.

5.1 Internet related Standardization activities

The Internet Research Task Force (IRTF) focuses on longer term research issues related to the internet while the parallel organization, the Internet Engineering Task Force (IETF) focuses on the shorter term issues of engineering and standards making. The ICNRG's main objective is to couple ongoing ICN research in the above areas with solutions that are relevant for evolving the Internet at large.

The BONVOYAGE project has been presented by CNIT at the interim meeting of the ICN Research Group (ICNRG) during the last IETF 93 meeting, held in Prague by Prof. Alfredo Grieco from CNIT. The target of the presentation was to illustrate the potential of the project as a framework to define vertical use cases on top of ICN communication technologies. The key concepts related to the Internames technology in BONVOYAGE have been also included in ad hoc standardization documents (IRTF Drafts) focusing on open challenges and middleware ICN-IoT architectures.

In addition to this physical project presentation, the following 5 Internet draft and RFC have been published:

1. **"ICN based Architecture for IoT – Requirements and Challenges"** Y. Zhang, D. Raychadhuri, L. A, Grieco, E. Baccelli, J. Burke, R. Ravindran, and G. Wang.
   IRTF- ICNRG, IRTF Internet Draft, draftzhang-iot-icn-challenges-02, Aug 2015.

2. **"Requirements and Challenges for IoT over ICN"** Y. Zhang, D. Raychadhuri, L. Grieco, E. Baccelli, J. Burke, R. Ravindran, G. Wang, A. Lindren, B. Ahlgren, O. Schelen
   IRTF-ICNRG, IRTF Internet Draft, draft-zhang-icnrg-icniot-requirements-00, Nov 2015.

3. IETF RFC 7933: Adaptive Video Streaming over Information-Centric Networking (ICN)
   C. Westphal, Ed., S. Lederer, D. Posch, C. Timmerer, A. Azgin, W. Liu, C. Mueller, A. Detti, D. Corujo, J. Wang, M. Montpetit, N. Murray. August 2016.

4. **"**ICN based Architecture for IoT**"**, Y. Zhang, D. Raychadhuri, L. A, Grieco, S. Sabrina, H. Liu, S. Misra, R. Ravindran, G. Wang. IRTF-ICNRG Internet Draft, draft-zhang-icnrg-icniot-architecture-01, July 16, 2017.

5. **"**Design Considerations for Applying ICN to IoT**",** D. Raychadhuri, L. Grieco, E. Baccelli, J. Burke, R. Ravindran, G. Wang, A. Lindgren, B. Ahlgren, O. Schelen
   IRTF-ICNRG Internet Draft, draft-zhang-icnrg-icniot-01, June 26, 2017

5.2 Transport planning related Standardization activities

BONVOYAGE partners put a strong effort in standardization and harmonization for the implementation of the DIRECTIVE 2010/40/EU on the "framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport".

NPRA has been strongly committed in this effort by contributing to standardization and harmonization work for transport planning as well as attendance in EC meetings for the regulation on multimodal transportation information services. This work has been influenced and inspired by knowledge gained from participation in the BONVOYAGE project, due to the fact that it was conducted from colleagues in the same unit of NPRA. In this respect, NPRA has given an effort to achieve cross-fertilisation between the development of the EU regulation for multimodal transport information services and the BONVOYAGE project.

The European Commission started work on the Delegated regulation on multimodal transport information services in 2014. The NPRA appointed experts has since then attended 8 of the 11 meetings until March 2016: on November 10th 2014, February 3rd 2015, April 28th 2015, June 2nd 2015, November 17th 2015, January 19th 2016, February 18th 2016 and March 18th 2016. At that point, a railway reform was carried into effect, and a part of the responsibility for public transport was switched from the NPRA to the newly established Norwegian Railway Directorate. Since March 2016, they have attended at least two more meetings on the Delegated Regulation. Most of the content was developed in the period when NPRA attended the meetings with experts in close cooperation with our personnel in BOVOYAGE working in the same unit of NPRA.

The NPRA was also active in other harmonization and standardization work, such as the CEN working groups for the revision of the NeTEx and Transmodel standards, namely CEN/TC 278 WG3 SG9 and CEN/TC 278 WG3 SG4, as well as a subgroup of Interoperable Fare Management Standard (ISO 24014) called ISO/TC 204 WG8.

The particular views promoted by the NPRA in the above mentioned meetings, gathered also from the input from BONVOYAGE, have been the preparation of the European NeTEx profile, where we worked to include tariff data already in the first version. In addition, we had an active participant in the Transmodel "modelling meetings", and a national (former NPRA) project for a national travel planner has provided important input to the NeTEx standard, where we had close cooperation with the core group for NeTEx. In addition NPRA has tried to put emphasis on the need to harmonize the National Access Points (NAP) across Europe and to find innovative concepts o for discovering, accessing and linking these services. This will facilitate development and

operation of end user services. It is also important in order to enhance attractiveness and user experience to cross-border information services. In our view BONVOYAGE offers such an innovative alternative.

For instance, the BONVOYAGE has submitted contribution to Urban ITS Standardization Mandate M/546 entitled "COMMISSION IMPLEMENTING DECISION C(2016)808 of 12.2.2016 on a standardizations request to the European standardizations organizations as regards Intelligent Transport Systems (ITS) in urban areas in support of Directive 2010/40/EU of the European Parliament" through the participation of NPRA to the mandate, both via email and via the face-to-face experts meetings. The standards where the project provided a contribution are:

1. Rc_MI22 "New standard development: To develop standard APIs and/or query/ data exchange format for interconnection of Journey Planning Systems in coherence with Transmodel v6 (as initially planned by CENTC278 WG3 SG8 Open Journey Planner Interface). (F.4.5)". BONVOYAGE suggested to consider also the interconnection of Journey Planning Systems among them and with National Access Points, providing information about the available national ITS data.
2. Rc_TM01 "A TM interface standard to enable exchange network performance data (Traffic conditions (LoS) and travel times) and planned and unplanned events/incidents (Roadworks, road/bridge/tunnel closures, bad weather and road surface conditions…) not currently covered by DATEX II. (E.4.3.2)". BONVOYAGE proposed to enhance the standard for DATEX II situation messages to more clearly be connected to the consequence for travel planning.
3. Rc_TM02 – "A coherent data model covering urban traffic control & management, such as traffic volume, occupancy rates, average speed travel times, traffic condition (LoS), events & incidents and circulation and traffic management plans (TMPs). (E.4.3.2)", BONVOYAGE provided insights about for time-dependent travel speed profiles for cars - time of day and day of week.
4. Rc_MI01 – "To develop a standard reference data model for network topology for New Modes (car/cycle sharing areas, carpooling areas, battery recharging places) in coherence with Transmodel V6. (F.4.1)". BONVOYAGE proposed to consider connection of network topologies for different travel modes (Rc_MI01).
5. Rc_MI24 – "Standard harmonization: To specify a unique solution for the models as developed by GDF and INSPIRE in overlapping areas: road, rail, waterway network, walking paths, administrative areas, named areas, etc.). (G.4.1)". BONVOYAGE provided suggestion for Infrastructure for Intermodal Spatial Information (Rc_MI24).

6 Open source software and prototypes

The project has developed several software tools and an integrated demonstrator reported in deliverables of WP7. Only part of these software tools have been released as open-source, since the other have been considered strategic for the developing partners. Specifically open source software concerns OpenGeoBase, the federated database for the National Access Point Infrastructure, and the publish-subscribe middleware used for the optimized fetching of georeferenced notification as those coming from DATEX II.

Two different demos exploit these open-source software tools, can be accessed BONVOYAGE web site: http://bonvoyage2020.eu/results/bonvoyage-demos, and concerns the BONVOYAGE NAP discovery services (Section 6.1) and a publish-subscribe service (Section 6.2). In addition to these demos, we also have other two prototypes (not fully based on open-source software) that concerns the BONVOYAGE linking services, namely based on a web (Section 6.3) and Android app.

6.1 Discovery services

This demo is based on OGB open-source software and concern Travel Centric Services and specifically a discovery service of GTFS public transit data for software developers, transit agencies and more. The backend infrastructure is based on three NAPs, aggregation information for Europe, America and rest of the world.

The demo allows to browse and download GTFS data by selecting the interested area. The service is based on OpenGeoBase: a distributed set of data base engines interconnected by an Information Centric Network (named-data.net). The demo hosts about 1000 indexed GTFS files, retrieved from www.transit.land.

By selecting a specific area with the selection box, it is possible to get all the GTFS files indexed for that area. The results showed include the transport companies which installed at least one stop in the area concerned.

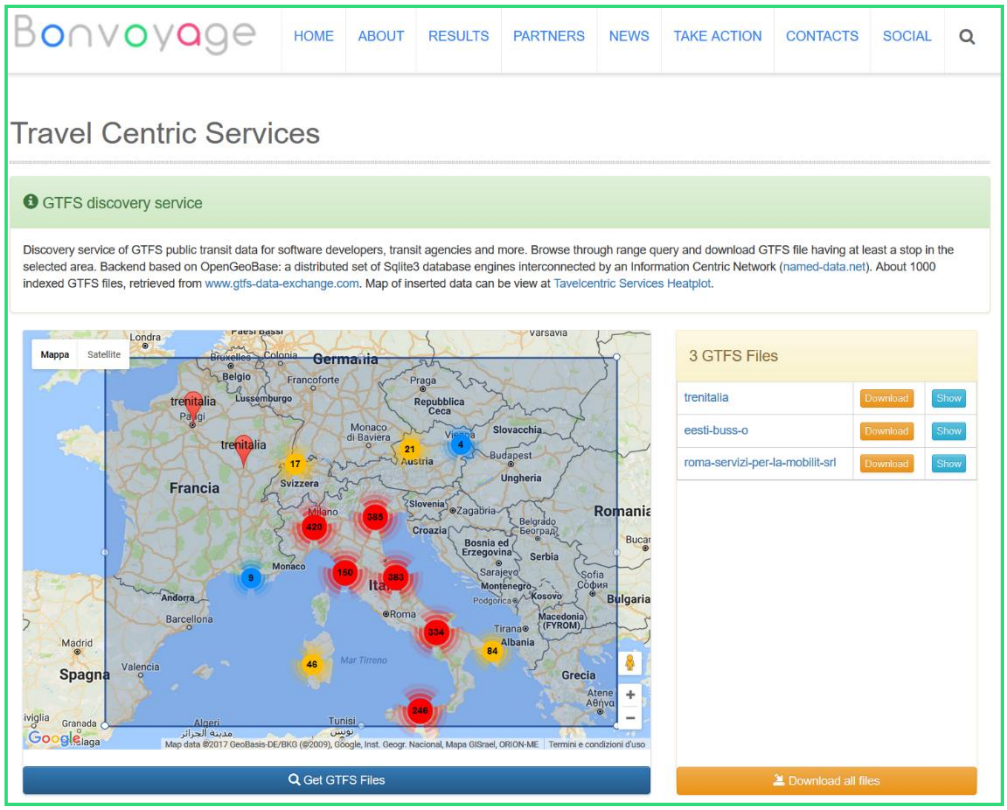


Figure 47 – Travel Centric Services Demo

6.2 ICN-IoT experimental testbed

This demo concerns the ICN-IoT experimental testbed which aim is to demonstrate the efficiency of the communication paradigms. The concrete solution offers: name-based communication scheme, flexible data delivery, and support for heterogeneous network infrastructures, platform interoperability, and technology-independent implementation of high-level applications.

The testbed aims at demonstrating that the data consumer applications is able to retrieve contents of its interest by using communication primitives made available by the developed middleware, without taking care of the underlying communication technology, the protocol architecture deployed in the IoT domain, and the heterogeneous nature of the network (e.g., ICN and IP). This testbed aims at demonstrating the adoption of networking APIs on the Internames Service Layer middleware within the ICN-IoT architecture (more details are discussed in D3.2)

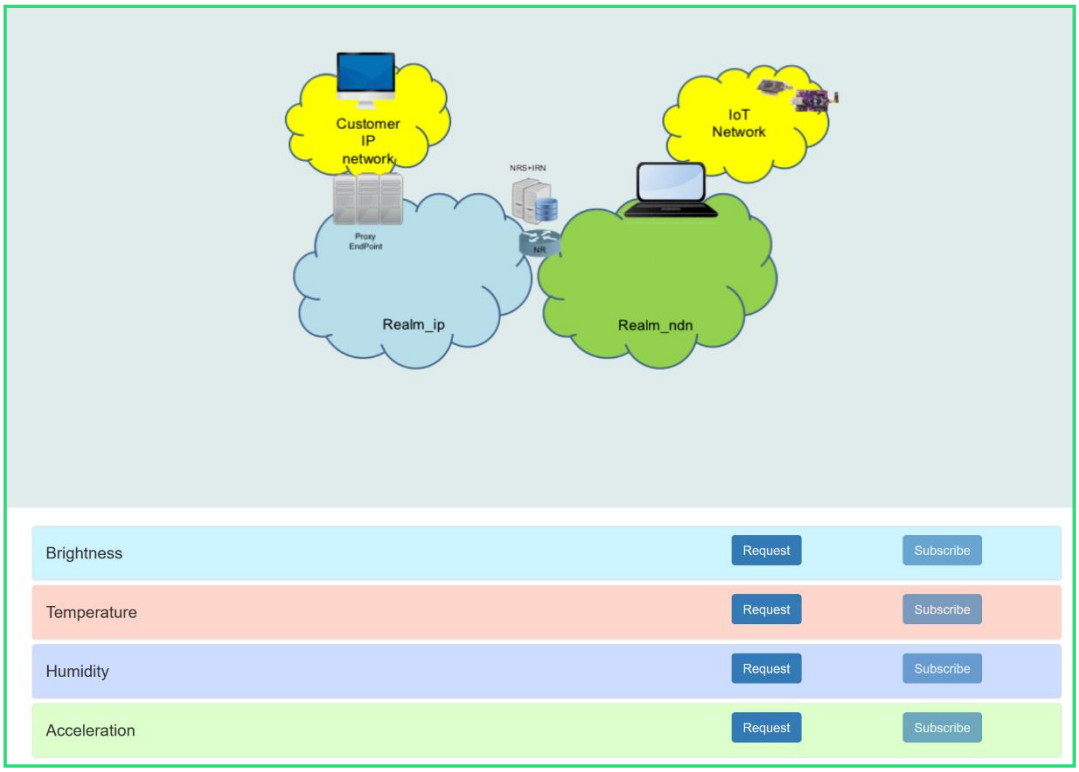


Figure 48 – BONVOYAGE ICN-IoT experimental testbed

The testbed showcases the communication system and the retrieval of data from different sensors: Brightness, Temperature, Humidity and Acceleration. For each parameter, it is possible to query the sensor's data both by asking a single request and by subscribing the update of data. By asking a single request the communication system retrieves the value of the parameter in that specific moment, while by subscribing the system retrieves, in the shell, all the values received, by the Data Consumer, after their publication. The graphs in Figure 32 represent acquired data from sensors as a function of the number of measurements performed. In the both cases (single request and subscription) the data retrieved with PUB-SUB functionalities are updated according to the variations occurred in the parameters and this prevent to download redundant data.

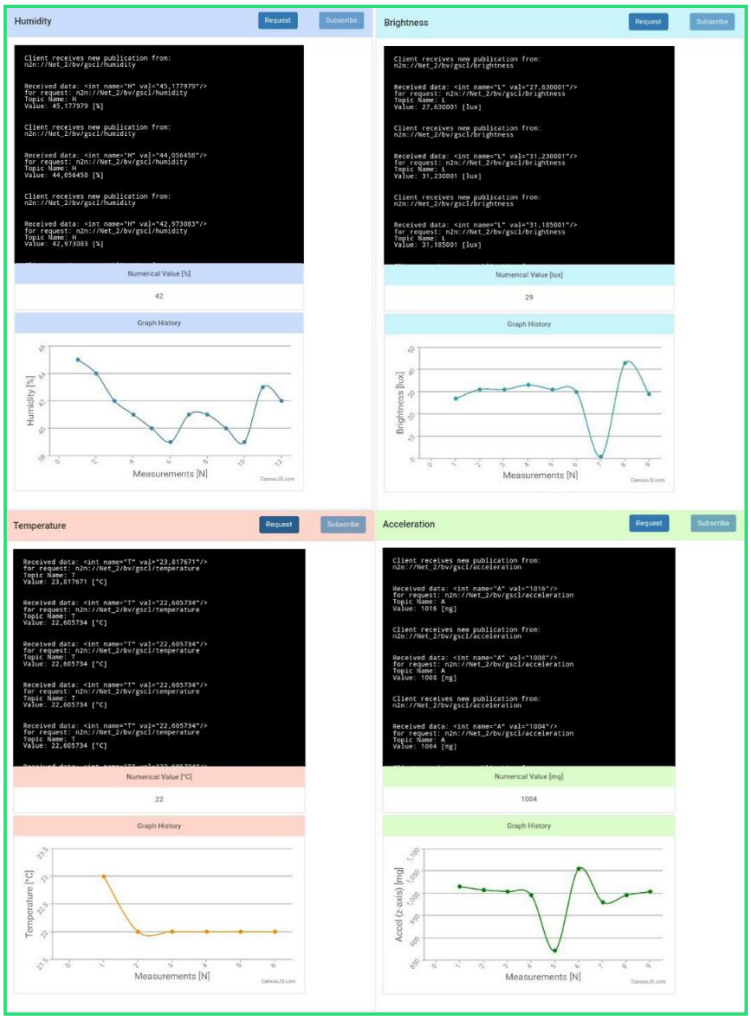


Figure 49 – Sensors measurement graphs

The implemented ICN-IoT architecture is an efficient solution for the management of data related to advanced services in the Intelligent Transportation Systems domain, by disseminating travel-centric data and participatory sensing contents over a heterogeneous network architecture.

6.3 Linking Services

These prototypes offer a WEB and an Android interface to door-to-door planning services offered by BONVOYAGE platform. The infrastructure is formed by an orchestrator which "links" several soloists as reported in deliverables 7.3.

From the WEB site it is possible to inquiry the orchestrator, which links all the available soloists to provide door-to-door solutions, or only single soloists (Rome and Bilbao). This is easily possible since the service interface to orchestrator or to soloists is the same (SPROUTE), thus making transparent the "stacking" of routing services to the applications.

Figure 50 reports a solution provided by the planner from a location in Oslo ad one in Rome. The figure shows different intermodal solutions, which include biking, private car, carpooling, train, airplane, bus, etc. This is a proof-of-concept about the feasibility of a federated European infrastructure where national/regional mono-modal/multimodal routing services (soloists) are linked each other to provide a door-to-door intermodal trip plan.

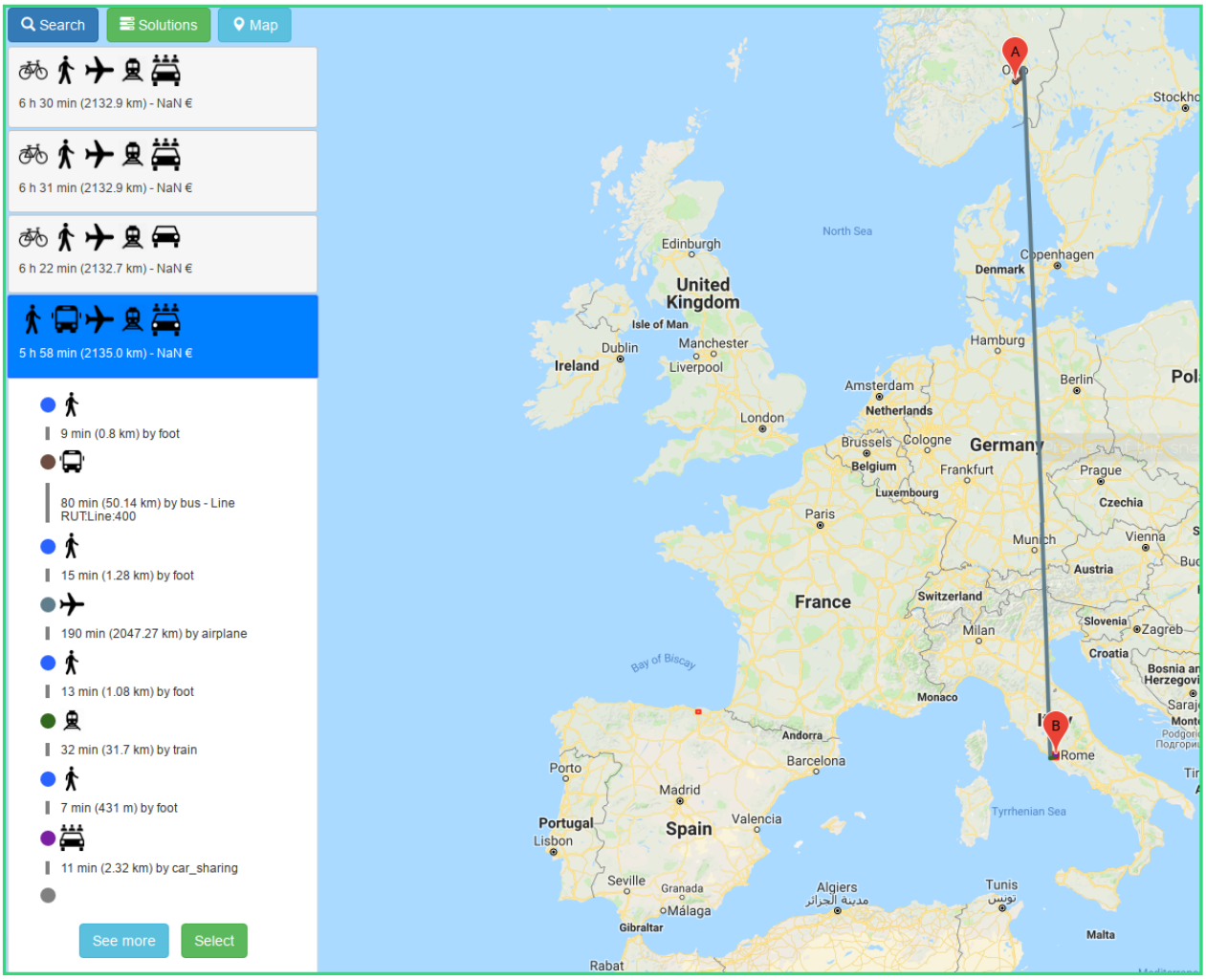


Figure 50 – Door-to-door intermodal trip planning

7 Conclusions

This report aims at describing the BONVOYAGE communication and dissemination activities performed during the whole duration of the project (from M1 to M36). The BONVOYAGE project dissemination strategy has been thought to be adaptive in order to maximize the impact of research results and deliverables and to transfer them to stakeholders and end-users in the most suitable way. The web site seeks to dynamically inform any interested stakeholders about the advancements in the project. A regularly-updated content has been achieved by creating news and events through all partners. Other social interactive media have been employed, such as LinkedIn group and Twitter account, in order to communicate to a large public. Moreover, active interaction with end-users has been established through dedicated questionnaires in order to get more information about their transport habits and travel preferences and, from another side, to sound out about their quality of experience with current public and private travel services. This active involvement enables to collect end-users feedback on their expectations and to ensure that BONVOYAGE project's developments are best matched to them. Furthermore an intense communication activity has been performed by the partners towards general public and industrial stakeholders. This deliverable also reports on the Standardization activities performed during the BONVOYAGE implementation and the contribution to EU regulation on ITS services.