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**Field Operational Tests Networking and Methodology Promotion**



## **Report on FOT Network activities**

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# Table of Contents

<b>Table of Contents</b>	<b>3</b>
<b>Executive Summary</b>	<b>7</b>
<b>1 Introduction</b>	<b>9</b>
1.1 FOT-Net Contractual References	10
1.2 Project Objectives	10
<b>2 Stakeholders workshops</b>	<b>12</b>
2.1 5th Stakeholders Workshop Deployment best practices	14
2.1.1 Agenda	14
2.1.2 Setting the scene & FOT-Net's new activities	15
2.1.3 Deployment Roadmap: how FOTs are used to reach policy goals (Moderator: Maxime Flament, ERTICO - ITS Europe)	17
2.1.4 How can we transfer the results of FOTs to stakeholders (Moderator: Tom Alkim, Rijkwaterstaat)	19
2.1.5 Wrap-Up, Irina Silva, ERTICO – ITS Europe	21
2.1.6 List of participants	21
2.1.7 Feedback	23
2.2 6th Stakeholders Workshop Exploitation of FOT results	24
2.2.1 Agenda	24
2.2.2 Introduction	25
2.2.3 Setting the scene and FOT-Net activities	26
2.2.4 Exploitation of FOT results: expectations from the stakeholders	28
2.2.5 Exploitation plans	29
2.2.6 ITS Innovations incubators	30
2.2.7 Wrap-up	32
2.2.8 Participants list	32
2.3 Coordination day on cooperative systems / 7th Stakeholders Workshop Key issues related to Cooperative Systems FOTs	35
2.3.1 Agenda	35
2.3.2 Workshop Objectives	37
2.3.3 Session 1 – Interoperability of Cooperative Systems and feedback to standards	38
2.3.4 Session 2 – Data Sharing	40
2.3.5 Session 3 – Dissemination of Cooperative Systems' benefits through cooperation between FOTs at EU and international level	41
2.3.6 Session 4 – Deployment prospects	43
2.3.7 Closing remarks and next steps	44
2.3.8 Action list	44
2.3.9 List of participants	45
2.4 8th Stakeholders Workshop Lessons learned from Pilots on Cooperative Systems	47
2.4.1 Agenda	47
2.4.2 Introduction	48
2.4.3 Session 1 – Interoperability of deployed cooperative systems in the pilots	51
2.4.4 Session 2 – Data sharing	54

---

D2.2 Report on FOT-Net activities	3
-----------------------------------	---

2.4.5	Session 3 – Deployment & business plans	56
2.4.6	Closing remarks and next steps	57
2.4.7	List of participants	57
2.4.8	Feedback	58
2.5	9th Stakeholders Workshop Speed Alert: from research to deployment	60
2.5.1	Agenda	60
2.5.2	Introduction	61
2.5.3	Meeting objectives	61
2.5.4	FOT-Net Working Groups, stakeholder needs and seminars	62
2.5.5	Speed alert, functions, variations and use and overview of FOTs on speed alert	62
2.5.6	Speed Alert, European Policy	64
2.5.7	SpeedAlert in EuroNCAP	64
2.5.8	Suppliers: Products on the market and future	65
2.5.9	Nomadic devices: Current products and future	65
2.5.10	Deployment of speed alert: the perspective of the public authorities	65
2.5.11	Status of Speed limit maps in Europe	66
2.5.12	European initiatives and perspective: including digital maps	66
2.5.13	Panel discussion on impact of Speed Alert deployment in the next 10 years	67
2.5.14	Closing remarks and next steps	67
2.5.15	List of participants	68
2.5.16	Feedback	69
2.6	10th Stakeholders workshop Naturalistic Driving	70
2.6.1	Agenda	70
2.6.2	Introduction	72
2.6.3	Session 1: NDS in Europe and US	72
2.6.4	Session 2: NDS with two different types of vehicles	74
2.6.5	Session 3: How to acquire answers on the main questions in NDS?	75
2.6.6	Session 4 – Stakeholders needs and use of outcomes	78
2.6.7	Closing remarks and next steps	79
2.6.8	List of participants	80
2.6.9	Feedback	81
2.7	FOT-Net final event	82
2.7.1	Agenda	82
2.7.2	Looking back on FOT-Net	83
2.7.3	Looking back on the FOTs	84
2.7.4	The FOT-Net legacy	86
2.7.5	Deployment of the results	87
2.7.6	Looking forward	88
2.7.7	List of participants	90
2.7.8	Feedback	91
<b>3</b>	<b>International workshops</b>	<b>92</b>
3.1	4th International Workshop	93
3.1.1	Agenda	93
3.1.2	Introduction	94
3.1.3	Round tables	94
3.1.4	Plenary session: Introduction	97

3.1.5	Welcome from the regions	97
3.1.6	Recommendations from Round Table 1: Cooperative Systems FOTs across the globe - What should be harmonized at this stage and what not?	98
3.1.7	Recommendations from Round Table 2: Actions linking to Deployment	99
3.1.8	Recommendations from Round Table 3: Tools for FOTs	100
3.1.9	Recommendations from Round Table 4: Setting priorities for Large Scale Naturalistic Driving observations	101
3.1.10	Conclusions and summary	102
3.1.11	List of participants	102
3.2	5th International Workshop	104
3.2.1	Agenda	104
3.2.2	Round Tables	105
3.2.3	Introduction	108
3.2.4	Welcome from the Regions: Introduction on FOT activities	108
3.2.5	Key statements from the Data analysis round table	109
3.2.6	Key statements from the Impact Assessment round table	111
3.2.7	Key statements from the Data Sharing round table	114
3.2.8	Key statements from the Event Definition round table	115
3.2.9	List of participants	119
3.3	6th International Workshop	121
3.3.1	Agenda	121
3.3.2	Introduction	122
3.3.3	Round table 1: Data analysis and impact analysis	122
3.3.4	Round Table 2: Strategies for deployment and satisfying stakeholders' needs	126
3.3.5	Round Table 3: Sharing of driver data from FOTs and Naturalistic Driving Studies	128
3.3.6	Round Table 4: Sharing of cooperative systems data	130
3.3.7	Plenary session	131
3.3.8	List of participants	132
3.3.9	Feedback	134
<b>4</b>	<b>Other workshops and events</b>	<b>135</b>
<b>5</b>	<b>Literature study on probe data</b>	<b>138</b>
<b>6</b>	<b>Conclusions</b>	<b>140</b>
6.1	FOT Network	140
6.2	Stakeholders workshops	140
6.3	International workshops	141
6.4	Selection and evolution of topics	142
6.5	Collaboration with other projects	142
6.6	Identification of speakers, participants and recruitment for events	143
6.7	Feedback	145
6.8	Conclusions and use of results	145
	<b>References</b>	<b>147</b>

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<b>List of Tables</b>	<b>148</b>
<b>List of Figures</b>	<b>149</b>
<b>List of abbreviations</b>	<b>150</b>

## Executive Summary

It is FOT-Net's purpose to serve as the "one-stop-shop" for FOTs by running an information exchange platform on FOTs; being the link to European and national FOTs, and strengthening international cooperation on FOTs. In this report, two major types of networking activities are described: stakeholders' workshops and international workshops.

During the second phase of FOT-Net, six stakeholders workshops were organised, and in addition a final event at the end of the project. The stakeholders' workshops had the following objectives: to periodically inform the stakeholders about FOT progress at European, national and international levels; to identify stakeholders' needs and how FOT activities can support the network, and to present key contributions that would stimulate the discussion on FOTs. Each workshop was organised around a specific topic. The main themes were: deployment roadmaps, exploitation of FOT results, different aspects of cooperative system FOTs, pilot projects on cooperative systems, Speed Alert systems, and Naturalistic Driving Studies. Usually each workshop started with a report of the different activities of the FOT-Net work packages, such as progress of the working groups and the stakeholders' analysis. Speakers from different stakeholder groups discussed the specific workshop theme from their perspective. Panel discussions and discussions with the audience were held in order to get a better view on the different interests and opinions of stakeholders. The workshop was always concluded with an overview of the future FOT-Net activities and events.

Three international workshops were also organised in conjunction with the ITS World Congresses. The objective was to contribute to the establishment of a global FOT expert network in order to exchange knowledge and best practice and to foster cooperation for FOT activities. The international workshops allowed for exchange of information about FOT activities in Europe, North America and Asia/Pacific. The workshops focussed on issues tackled by the FOT-Net working groups, as well as common issues identified by the three leading regions, such as FOT methodology, data sharing and analysis, and actions linked to deployment. The workshops took the form of four parallel thematic round table sessions in the mornings, in which each region was represented by at least one expert. The experts were given the task to answer together a series of predefined questions. The result was in most case an interactive discussion with the audience. During the afternoon plenary session, representatives from the three regions gave an update on their respective FOT/NDS developments and the round table session convenors presented their common answers and conclusions. The five working groups of FOT-Net (WP3), the FOT Tools work package (WP5) and the Stakeholders analysis work package (WP6) were actively involved in the organisation of the round tables, and often used these events to gather information and ideas for their work and to present their ideas to international experts.

During the six years of the FOT-Net 1 and FOT-Net 2 projects, a community has been built consisting of people who are either involved in FOTs themselves, or who are stakeholders with an interest in the results of FOTs. The stakeholder meetings and international workshops provided good opportunities to both exchange the ideas developed in FOT-Net and in the wider community and also, to discuss and generate new ideas and insights. The results of the meetings were fed back to the wider community in several ways: in the meeting reports, in the presentations published on the FOT-Net website and through the working groups and seminars, which resulted in updates to the FESTA methodology. The network has continued

to grow and feedback from participants shows that it remains a valued mechanism for sharing best practices.

# 1 Introduction

The objective of WP2 was to continue to serve FOT-Net's purpose as the "one-stop-shop" for FOTs by:

- Running an information exchange platform on FOTs: database on FOTs, lessons learned and best practices.
- Being the link to national FOT projects.
- Linking, cooperating with and supporting European cooperative systems FOTs.
- Strengthening international cooperation on FOTs.

In this report two major types of networking activities are described: the stakeholder workshops and the international workshops. The FOT wiki, ([wiki.fot-net.eu](http://wiki.fot-net.eu)), where information is available on all FOTs known to FOT-Net, is described in D2.1. Stakeholders workshops focussed on the priorities of stakeholders of FOTs, in preparing, conducting and evaluating FOTs as well as on the deployment of the results. The international workshops allowed for exchange of information about FOT activities in Europe, North America and Japan (and other Asia Pacific countries). The workshops focussed on issues tackled by the FOT-Net working groups (task WP3.2), as well as common identified items by the three regions, such as methodology, data sharing and analysis, and actions linked to deployment.

Networking took place in different forms, and also in other work packages. In WP4, seminars were organised, in WP6, an analysis of stakeholders was performed and recommendations developed for the deployment of FOT results, and in WP7, a variety of dissemination activities took place. All information that was gathered by networking activities in all work packages was made available to the FOT community throughout the programme via the FOT-Net website.

The FOT-Net partners (and associated partners) represent the different stakeholder sectors, and partner organisations were involved in FOTs, and all partners contributed to the networking activities in WP2. During consortium meetings which took place four times a year, information exchange about the FOTs in the different countries formed an important part of the agenda. This information can be found in each of the individual quarterly reports (WP1). This information exchange made it possible to create awareness on the status of European and national FOTs, which formed also a basis for the setting of the agenda for the stakeholder meetings.

This document has the following structure:

In Chapter 2, the stakeholder workshops are addressed. For each of the seven meetings the agenda, the extensive workshop report, the list of participants and the evaluation are provided. The meeting reports themselves have been available on the FOT-Net website since shortly after each event took place.

In Chapter 3 the international workshops (organised in conjunction with the ITS World Congress) are addressed. For the three workshops, the agenda, the extensive meeting report, the list of participants and the evaluation are provided. Also the reports of these meeting were made available at the website.

Chapter 4 briefly describes other meetings where WP2 was actively involved. Reporting of these meetings also took place in the annual (and quarterly) reports.

Chapter 5 describes a rather different type of activity, the probe data study. This study was requested by the Commission in collaboration with iMobility Support, in the frame of the cooperation with the US and Japan.

Chapter 6 draws conclusions from the range of WP2 activities, including commentary of the FOT Network itself and key conclusions arising from the stakeholder and international workshops, selection of topics, speakers and participants; collaboration with other projects and feedback received.

## **1.1 FOT-Net Contractual References**

FOT-Net 2 is a Support Action submitted for the call FP7-ICT-2009.6. It stands for *Field Operational Tests Networking and Methodology Promotion*.

The Grant Agreement number is 269983 and project duration is 39 months, effective from 01 June 2011 until 31 March 2014. It is a contract with the European Commission (EC), Directorate General Communication Networks, Content and Technology (DG CONNECT).

The EC Project Officer is:

**Myriam Coulon-Cantuer**

EUROPEAN COMMISSION

DG CONNECT – H5

Office: BU31

B - 1049 Brussels

Tel: +32 2 299 41 56

E-mail: Myriam.Coulon-Cantuer@ec.europa.eu

## **1.2 Project Objectives**

The prime goal of FOT-Net 2 is to increase the momentum of the network achieved during FOT-Net 1, by further developing the strategic networking of existing and future National, European and Global FOTs i.e. US and Japan. During 39 months, the FOT Network meets in six bi-annual FOT stakeholders meetings and three international FOT meetings.

FOT-Net 2 also focuses on methodology based on recent FOT experiences. Through a series of targeted meetings, it gathers the relevant experts to revise and adapt the FESTA methodology for FOTs on Advanced Driver Assistance Systems (ADAS), Nomadic devices, Cooperative systems, and, in addition, address Naturalistic Driving Studies.

Five new expert working groups are created in order to clarify critical topics related to the legal and ethical issues, data analysis, incident definition, impact assessment, and data sharing. The revised FESTA methodology is promoted through six seminars supported by webinars.

FOT-Net 2 creates a new web-based inventory of existing tools for data acquisition, database structure, data analysis to facilitate the setup of new FOTs.

FOT-Net 2 will continue to act as a multiplier for the dissemination and awareness of FOT activities especially in terms of inter-activities support and outreach.

Finally, FOT-Net 2 evaluates contributions of FOTs to policy goals and market deployment using an improved methodology for stakeholders' analysis.

## 2 Stakeholders workshops

FOT-Net has established a strategic networking platform in order to address common issues related to the practical organisation, set up and follow-up of FOTs results. As part of the different cooperation platforms offered by the project, the Stakeholders workshops have as objectives:

- To inform periodically the stakeholders about FOT progress at European, national and international levels.
- To identify stakeholders' needs and how FOT activities can support the network.
- To present key contributions that will stimulate the discussion on FOTs.

Six stakeholders' workshops were organised, and in addition a final event, which was decided in the second contract amendment when the project was extend for three months. The stakeholders and international workshops have inherited their numbering in FOT-Net 2 from FOT-Net 1. Hence the first stakeholders' workshop in FOT-Net 2 is called the 5th stakeholders workshop.

**Table 1 List of Stakeholders workshops**

24/03/2011	5 <sup>th</sup> Stakeholders Workshop	Brussels	Workshop on Deployment best practices
28/11/2011	6 <sup>th</sup> Stakeholders Workshop	Brussels	Exploitation of FOT results
25/05/2012	Coordination Day on Cooperative Systems FOTs (7 <sup>th</sup> Stakeholders workshop)	Brussels	Key issues related to Cooperative Systems FOTs
26/02/2013	8 <sup>th</sup> Stakeholders workshop	Brussels	Lessons learned from Pilots on Cooperative Systems
04/06/2013	9 <sup>th</sup> Stakeholders Workshop (Joint FOT-Net - ADASIS - TN-ITS workshop)	Dublin	Speed Alert: from research to deployment
26/11/2013	10 <sup>th</sup> Stakeholders Workshop	Brussels	Naturalistic Driving Studies (in collaboration with the UDRIVE project)
18/03/2014	FOT-Net final event	Amsterdam	

All stakeholders' workshops have agenda's, reports, participant lists and presentations available at the website:

[http://www.fot-net.eu/en/networking/stakeholders\\_meetings/stakeholders\\_meetings.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/stakeholders_meetings.htm)

The structure of the following sections is as follows:

- Agenda.
- The full report of the workshop, usually structured by the different sessions.
- The list of participants, with statistics on number of participants, gender, and type of organisation. Five types of organisation are distinguished: (1) Associations/user

groups/European Commission, (2) Industry, (3) Universities/research organisations, (4) Road operators/public authorities, and (5) Other/unknown. Classification is sometimes not very exact, participant's gender is not always captured, organisations may fall in different categories or sometimes it is an arbitrary choice in which category to place an organisation. Also the participant list was not always complete due to some delegates not providing their details.

- Feedback from the evaluation forms that were handed out during the workshop to participants. Note that not all participants did fill in the forms and that from two of the workshops, these forms are missing.

## 2.1 5th Stakeholders Workshop Deployment best practices

[http://www.fot-net.eu/en/networking/stakeholders\\_meetings/fot-net\\_5th\\_stakeholders\\_workshop\\_download\\_presentations.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/fot-net_5th_stakeholders_workshop_download_presentations.htm)

### 2.1.1 Agenda

<b>09:30</b>	<b>Coffee and registrations</b>	
	<b>Setting the scene &amp; FOT-Net's new activities</b>	
<b>10:00</b>	Meeting objectives and FOT-Net overview	Irina Silva, ERTICO – ITS Europe
<b>10:15</b>	FESTA methodology: findings on its implementation and revision in progress	Yvonne Barnard, University of Leeds
<b>10:35</b>	Development of methodological tools for stakeholders needs analysis	Christhard Gelau, BAST
<b>10:45</b>	Q&A	
<b>10:50</b>	<b>Break</b>	
	<b><i>Deployment Roadmap: how FOTs are used to reach policy goals</i></b> <i>Presentations will be followed by Q&amp;A</i>	Moderator: Maxime Flament, ERTICO – ITS Europe
<b>11:00</b>	European Commission viewpoints on the role of FOTs towards deployment	Myriam Coulon-Cantuer, European Commission
<b>11:20</b>	Role of public authorities in definition & implementation of FOT	Jane Lappin, Volpe Center, US Department of Transportation
<b>11:40</b>	Role of public authorities in definition & implementation of FOT: the AOS FOT	Robbert Verweij, Ministry of Infrastructure and Environment, The Netherlands
<b>12:00</b>	Q&A	
<b>12:20</b>	<b>Lunch &amp; Networking</b>	
	<b><i>Deployment Roadmap: how FOTs are used to reach policy goals (cont.)</i></b> <i>Presentations will be followed by Q&amp;A</i>	Moderator: Maxime Flament, ERTICO – ITS Europe
<b>13:30</b>	Japan's deployment roadmap: reaching policy goals through public-private cooperation	Masao Fukushima, NISSAN
<b>13:50</b>	Role of public authorities in definition & implementation of FOT, a researcher's point of view: the ISA Trial Gent	Johan de Mol, University of Gent, Belgium

14:10	Role of public authorities in definition & implementation of FOT: a regional experience	Svend Tøfting, Denmark - North Denmark Region (Region Nordjylland)
14:25	Panel Discussion and Questions from the Audience	
14:40	<b>Coffee break</b>	
	<b>How can we transfer the results of FOTs to stakeholders</b> <i>Presentations will be followed by Q&amp;A</i>	<b>Moderator: Tom Alkim, RWS</b>
15:00	AKTIV	Matthias Mann, PTV
15:15	FREILOT	Gert Blom, City of Helmond
15:30	SeMiFOT2	Helena Gellerman, SAFER
15:45	TeleFOT	Roberto Montanari, University of Modena and Reggio Emilia
16:00	<b>Wrap-up</b>	
16:15	<b>Adjourn</b>	

### 2.1.2 Setting the scene & FOT-Net's new activities

#### Meeting objectives and FOT-Net overview, Irina Silva, ERTICO - ITS Europe

The aim of the FOT-Net stakeholders meetings is to gather European players interested in FOTs to share information, results and developments of trials which are being carried out at European and national levels. The aim of these meetings is to foster cooperation and exchange of information about the results of these field tests in terms of safety, efficiency, environmental benefits as well as cost-benefit and socio-economic impact.

FOT-Net issued in December 2010 a “**Common roll-out plan to support coherent development and implementation of FOTs**”. A number of issues were raised and discussed in the framework of the FOT Networking Platform activities, namely through the seminars on the implementation of the FESTA methodology and Stakeholder meetings and International Workshops. The issues discussed reflected the experts and stakeholders' priorities with respect to FOT activities such as methodology, planning and preparation, FOT running, analysis and evaluation. The aim of the Common Roll-out plan is to bring together the results of these discussions and provide recommendations to the FOT community.

The Stakeholders workshops will be one of the mediums to address the actions identified in the Common Roll-out plan. In this fifth edition of the Stakeholders Workshop, the theme was “**Deployment Roadmap: how FOTs are used to reach policy goals**”. The workshop provided a forum for the presentation and discussion on: deployment best practices and the role of Public Authorities in the definition and implementation of FOTs. Public Authorities are stakeholders with a key interest in the results of FOTs as these will support the Public Authorities in establishing the right policy framework for the deployment ITS technologies.

This workshop provided an opportunity to look at best practices and examine different kinds of approaches to this matter.

FOT-Net also took this opportunity to address its new activities: the revision of the FESTA methodology, the plans for transfer of FOT knowledge (seminars) and the development of methodological tools to identify stakeholder needs.

And lastly European FOT related activities looked into how the project results can be transferred to the stakeholders: what is the exploitation plan? What will be done after the FOT is completed to ensure deployment?

For each subtheme addressed at the workshop, speakers were given a set of questions to guide their presentations. *All presentations are available online:* [http://www.fot-net.eu/en/our\\_services/stakeholders\\_meetings/fot-net\\_5th\\_stakeholders\\_workshop\\_download\\_presentations.htm](http://www.fot-net.eu/en/our_services/stakeholders_meetings/fot-net_5th_stakeholders_workshop_download_presentations.htm)

### **FESTA methodology: findings on its implementation and revision in progress, Yvonne Barnard, University of Leeds**

A FOT methodology was developed in 2008, FESTA (EC-funded project). It is a systematic research-oriented approach to define tests. It allows the comparison of FOTs and the development of a common language - so important in building expert knowledge.

Feedback on FESTA was collected within FOT-Net coming from the 8 seminars that took place between 2008 and 2010. All information is reported in Deliverable 3.2 available on the FOT-Net website. The issues identified during these seminars will be addressed in a revision of the FESTA handbook (planned to be finalised by September 2011). Subsequently WGs will provide new knowledge to tackle further the most complex issues. The seminars will also serve to open the discussion to the FOT community. Five WGs focusing on different issues will start in September 2011. Six seminars will be organised until 2013.

### **Development of methodological tools for stakeholders needs analysis, Christhard Gelau, BAST**

One of FOT-Net's new activities is "Actions linking to deployment" in which a stakeholder needs analysis will be performed. All stakeholders have a role to play towards deployment (either positive or negative). It was identified that past and current FOTs often lack a balanced representation of stakeholders (to reach deployment, balance is crucial). FOT-Net sets itself to tackle this imbalance by proposing a process that ensures stakeholder involvement in FOTs by

- Identifying all stakeholders (including missing ones) in FOT activities.
- Exploring and map the needs of the stakeholders.
- Identifying possible deployment scenarios.
- Deriving strategies in order to ensure that all stakeholders take part in the deployment scenarios.

FOT-Net will

- Step 1: Identify important stakeholders not involved (ERTICO, TNO, BAST)
- Step 2: Perform a targeted consultation (e.g. survey, interviews, focus groups) to find out level of awareness and interest in FOT
- Step 3: Classification of stakeholders

- stakeholders not aware: raise awareness (dissemination materials, newsletters etc.)
- stakeholders aware but not interested: in-depth exploration of reasons (e.g. interviews)
- stakeholders aware and interested: give opportunity for active participation/contribution (e.g. become associated partner)
- Step 4: Consultation workshop on Deployment scenarios and involvement of stakeholders

### **2.1.3 Deployment Roadmap: how FOTs are used to reach policy goals (Moderator: Maxime Flament, ERTICO - ITS Europe)**

This session brought together different kinds of stakeholders (public authorities, industry, and researchers) to give their views on this topic. In preparation the speakers were requested to focus on the following aspects (where applicable):

1. As a stakeholder what was your involvement in the definition of the deployment roadmap and subsequent FOTs?
2. How did the FOTs fit into a broader deployment plan?
3. What kind of involvement did the Public Authorities have? Was it only funding? Did they participate in the formulation of the research questions of the FOTs?
4. Were other stakeholders involved? Were you able to lead a public/private partnership?
5. Did you expect more to be achieved in terms of policy with these results?
6. Would it have been relevant to conduct other trials? If yes, why did it not happen?
7. Give your point of view as a stakeholder in general: your recommendations.
8. Focus on how the FOT was developed, who was involved and how you plan to use the results.

This edition of the Stakeholders workshop was extended to speakers from outside Europe as it was believed that their views would be beneficial to understand how FOTs can be used following different approaches. The speakers included

From the Public Authorities:

- Myriam Coulon-Cantuer, European Commission
- Jane Lappin, Volpe Center, US Department of Transportation
- Robbert Verweij, Ministry of Infrastructure and Environment, The Netherlands
- Svend Tøfting, Denmark - North Denmark Region (Region Nordjylland)

From Industry:

- Masao Fukushima, NISSAN

From Research:

- Johan de Mol, University of Gent, Belgium

The motivations behind FOTs are quite the same, all regions want to tackle societal challenges and they regard FOTs as a tool or step in their larger scheme to deploy ITS

solutions that can solve the societal challenges. The approaches of the regions for the use of FOTs are however different and all have best-practices that can be shared among the stakeholders.

In Europe, FOTs are being carried out at National, Regional and Pan-European levels. They follow more of a **bottom-up approach** often with consortia pushing to have FOTs carried out rather than aligning the tests with policy. The FOTs are considered a natural follow-up to lab-research and seen as a step that will lead to policy and deployment of technologies.

When it comes to the formulation of the **research questions**, this differs when it comes to the pan-European or National level. In EC projects: the research questions result from consultation with the project partners and in this case it may be that not all types of stakeholders, namely the Public Authorities have a say on the focus of the FOTs. At national level this differs since it is the government that guides the research questions (case of the Netherlands exemplified this).

The formation of **consortia** behind the FOTs varies in Europe. They are naturally larger and more complex in nature as they are often trans-border FOTs (they need to involve more partners). There are advantages and disadvantages to this approach. On the one side the bigger the consortia are, the more difficult they are to manage. And it could be beneficial to leave some stakeholders/experts outside of the consortia so that they can keep a critical eye on the FOT. On the positive side, these larger consortia include participants from several member states allowing these countries to all work following a common framework and methodology. This in turn allows for transferability of results.

Raising **awareness** among the stakeholders in Europe is done through the FOT projects themselves and/or through the FOT-Net activities. Work through FOT-Net has allowed for more coordination and cooperation at European level.

The US is following a **top-down approach**. The US DOT programs and subsequent evaluation (FOTs) are aligned with Congress legislation. The **consortia** in the US tend to be much smaller than in comparison to Europe: they are as large as they need to be to match the protocol requested in the call for proposals. More is not needed. As the FOTs are the result of a top-down approach, the scope and **research questions** are guided by the US DOT.

The US DOT puts a lot of effort into raising **awareness** of the stakeholders and communicating the impact of the ITS program. A lot of efforts are put into webinars, workshops, courses and providing resources online for the stakeholders. The US DOT continuously reviews its practices for evaluating and communicating findings to improve relevance, clarity and reach.

In Japan **different approaches** to FOTs are applied in National projects, Private projects with public support and Private projects. The National projects are conducted at nation-wide scale as result of political action, they involve many partners and require work on the infrastructure. The Private projects with public support are led by individual car makers with the public sector's authorisation. And finally the private projects are the result of decision of individual car makers.

When it comes to **consortia**, the private projects are usually led by one key stakeholder, usually the car maker. The main advantage here is the faster deployment since fewer stakeholders are involved.

When it comes to the definition of **research questions** in the national projects, they are defined jointly by the private sector and government.

Japan remains at the forefront of the activities: some FOTs have been completed and stakeholders are moving ahead with proposing new FOT projects.

When it comes to **awareness** the national projects were seen to be very effective for the promotion of ITS technologies.

In conclusion,

1. Different approaches for the use of FOTs towards deployment were presented from Europe, US and Japan, each with their particularities and challenges. Some approaches are more innovation oriented but not necessarily more harmonised, while others are embedded in a policy framework but could benefit from the contribution of other stakeholders for defining the FOT research programme and questions. There isn't one unique approach that can be prescribed for the use of FOTs to reach policy goals, all approaches were seen to have positive elements that could be taken into account. These elements should be taken into account when developing an FOT.
2. When it comes to consortia, the main lesson that resulted was "consortia should be as large as they need to be". The objectives of FOT have to be taken into consideration when forming the consortia. In comparison to US and Japan, European consortia tend to be larger since they are often trans-border FOTs. Some stakeholders could be left out for a reason: they can provide an external critical view about the FOT.
3. When it comes to the research questions in the cases of the US and the Netherlands these were guided by the government (the funding entity), while in pan-European FOTs these are left to project partners. In this latter case concerns were raised that some key stakeholders are not involved in the process of definition of the research questions namely the Public Authorities.
4. The important role of awareness activities in FOTs was stressed in what regards:
  - a) linking politicians to experts. There is a need to involve policy makers in the process and raise their awareness, as they are the ones defining mobility goals and means. Experts can help them avoid taking uninformed decisions about mobility;
  - b) using the FOTs as an awareness raising activity and training, with those who will after all be using the systems that are being tested and also with those who can set an example, e.g. politicians. Drivers could be used as role models and to generate acceptance;
  - c) creating support from stakeholders. FOTs can provide a safe, collaborative platform for all stakeholders to work together.

#### ***2.1.4 How can we transfer the results of FOTs to stakeholders (Moderator: Tom Alkim, Rijkwaterstaat)***

For this session, speakers representing research, FOT and pilot projects were invited to share and reflect on their experiences on how the results of FOTs can be transferred to stakeholders. They were given a set of questions to reflect on:

We kindly ask you to focus on the following aspects, where applicable:

1. Does your project cover all range of stakeholders? If not what is the reason? And what is your recommendation to improve that in future projects?
2. Does the project fit into a broader deployment plan?
3. What is your exploitation plan?
4. How will the results be exploited after/during the pilot?
5. Who is leading the exploitation of the results? A public authority? Industry?
6. How will they be transferred to the stakeholders (namely the Public Authorities) and in your specific case how do you intend to use the results?
7. Give your point of view as a stakeholder on the session topic: your recommendations.

The following speakers were invited:

- Matthias Mann, PTV representing AKTIV
- Gert Blom, City of Helmond representing FREILOT
- Helena Gellerman, SAFER representing SeMiFOT2
- Roberto Montanari, University of Modena and Reggio Emilia representing TeleFOT

The projects represented fit into a broader deployment plan: they either are the continuity or are leading to other R&D activities having deployment as end-goal. AKTIV through UR:BAN, Sim-TD, Sim-TD follow up and DRIVE C2X. SeMiFOT2 is the continuity of SeMiFOT and more activities are expected to follow-up. In the case of FREILOT as it is a EC Pilot B, the services developed during the project will continue the operations after the project is concluded. FREILOT follows also a broader Dutch mobility policy plan, and the previous work from CVIS and SAFESPOT. TeleFOT is a EC funded pan-European FOT which will run until May 2012.

The speakers highlighted the need to have good links to the stakeholders. Even though they may not be a direct partner in the projects, their needs have to be taken into account and the results have to be communicated to them. But how to communicate the FOT results to the Stakeholders? The city of Helmond gave the example, when it comes to the FOT or pilot, as a city they are interested in the solution not in the technology. So the argument for deployment is already on the table: people need the solutions to solve their problems and needs! The challenge remains how to communicate the benefits of the solutions. The FOT may have gathered all the facts but in the end policy makers and politicians may remain indifferent. The “how” to exploit the results should be better grasped by the experts.

In the case of FREILOT the benefits were so evident that it just strengthened the deployment case, with presentations and demonstrations of the services being piloted the project was able to extend its activities from truck fleets to also emergency services in Helmond.

When the benefits are not as obvious to communicate to the non-expert audience other means should be considered. The Demo Theatre developed by Test Site Sweden, is a good example of how to approach a non-expert audience. Its objective was to show a broad

description of ITS and its influences. It allows visualization of complex services and systems by showing them in a context. Issues in the goods- and personal- transport area was highlighted and made comprehensible.

Another example are the local stakeholder workshops that TeleFOT organises in the countries that are part of TeleFOT. These are more country-specific activities allowing a more targeted discussion.

In addition to the recommendations given in the previous session other recommendations can be given regarding raising awareness:

- Target groups should be addressed through specific Media
- Listen to your stakeholders and keep them in the loop
- Actively involve your stakeholders

### **2.1.5 Wrap-Up, Irina Silva, ERTICO – ITS Europe**

The theme of 5<sup>th</sup> FOT-Net stakeholders workshop was “Deployment Roadmap: how FOTs are used to reach policy goals”. This was one of the issues that was raised in the “Common roll-out plan to support coherent development and implementation of FOTs”. The Roll-out plan will guide future stakeholders workshops but FOT-Net will also respond to the feedback from the community and whenever possible will answer to its requests.

In this edition close to 50 people attended the workshop. Participants appreciated the opportunity to hear about the experiences from outside Europe. It would be valuable for the FOT community to go more in-depth on the topic of exploitation of results, and bring together stakeholders who are not part of the FOT community to give their views on this matter. This would be beneficial to better understand how to exploit the results.

All presentations are available online: [http://www.fot-net.eu/en/our\\_services/stakeholders\\_meetings/fot-net\\_5th\\_stakeholders\\_workshop\\_download\\_presentations.htm](http://www.fot-net.eu/en/our_services/stakeholders_meetings/fot-net_5th_stakeholders_workshop_download_presentations.htm)

Next FOT-Net events:

- Seminar on Practical issues in starting up a FOT of Cooperative Systems and defining research questions, hypotheses and performance indicators, Vigo, 15 April
- Special Session “Revision of the FOT methodology: preliminary results and working groups”, ITS European Congress, Lyon, 06 – 09 June
- Final FESTA revision seminar, Gothenburg, 08 September
- Kick-off of WGs on addition to FESTA, Gothenburg, 09 September
- 6<sup>th</sup> FOT-Net Stakeholders Workshop and 2<sup>nd</sup> Seminar, Late Sept/beg of October TBC
- 4<sup>th</sup> FOT-Net International Workshop, ITS World Congress, Orlando, 16 October

### **2.1.6 List of participants**

**Table 2 List of participants 5<sup>th</sup> stakeholders workshop**

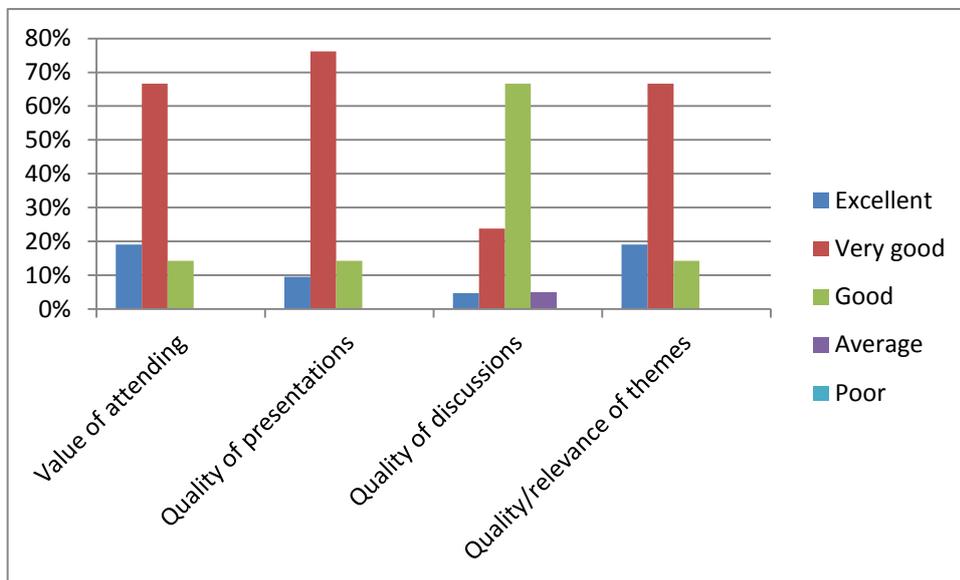
Company Name	Last Name	First Name
ASFA	Toulminet	Gwenaëlle

<b>AUDI</b>	Habermann	Bo
<b>Austrian Road Safety Board</b>	Nussbaumer	Cornelia
<b>AV Consult</b>	Vits	André
<b>BASt</b>	Gelau	Christhard
<b>Chalmers</b>	Franzen	Stig
<b>City of Helmond</b>	Blom	Gert
<b>City of The Hague</b>	Molenschot	Toine
<b>DEKRA e.V.</b>	Fuchs	Sarah
<b>ERTICO - ITS Europe</b>	Balistreri	Amélie
<b>ERTICO - ITS Europe</b>	Csepinszky	András
<b>ERTICO - ITS Europe</b>	Fischer	François
<b>ERTICO - ITS Europe</b>	Flament	Maxime
<b>ERTICO - ITS Europe</b>	Kompfner	Paul
<b>ERTICO - ITS Europe</b>	Mure	Sébastien
<b>ERTICO - ITS Europe</b>	Silva	Irina
<b>European Commission</b>	Coulon-Cantuer	Myriam
<b>European Commission</b>	Ferreira	Francisco
<b>FIA</b>	Simcic	Gabriel
<b>Ford Europe</b>	Ress	Christian
<b>Fundación CIDAUT</b>	Vega	Henar
<b>Ghent University</b>	De Mol	Johan
<b>HiTec</b>	Aigner	Walter
<b>IBCN-IBBT</b>	Carels	David
<b>IFSTTAR</b>	Medevielle	Jean-Pierre
<b>Institut für Kraftfahrzeuge (ika)</b>	Zlocki	Adrian
<b>IRIDIUM</b>	Seisdedos	Miguel
<b>itsdalarna utvecklings AB</b>	Hallin	Dan
<b>Ministerie van Infrastructuur en Milieu, DG Mobiliteit</b>	Verweij	Robbert
<b>Mitsubishi Motors Corp.</b>	ITO	Masayoshi
<b>ITS Euskadi</b>	Viteri	Jose
<b>Nissan Motor Co. ,Ltd.</b>	Fukushima	Masao
<b>Nissan Motor Co., Ltd.</b>	Takahashi	Seiki
<b>Nissan Motor Manufacturing (UK) Ltd.</b>	Ikeda	Makoto
<b>North Denmark Region</b>	Tøfting	Svend
<b>PRESS4TRANSPORT</b>	Hedlund	Bjoern
<b>PTV AG</b>	Mann	Matthias
<b>Renault</b>	Mougammadoussane	Aurélie
<b>Rijkswaterstaat</b>	Alkim	Tom
<b>SAFER</b>	Gellerman	Helena
<b>TNO</b>	Faber	Freek
<b>University of Leeds</b>	Barnard	Yvonne

<b>University of Modena and Reggio Emilia</b>	Montanari	Roberto
<b>US DOT, Volpe Center</b>	Lappin	Jane
<b>Vicomtech-IK4</b>	Otaegui	Oihana

Number of participants	45
Number of women – men	10 - 25
Associations/user groups/European Commission	10
Industry	12
Universities/research organisations	10
Road operators/public authorities	11
Other/unknown	1

### 2.1.7 Feedback



**Figure 1 Feedback 5<sup>th</sup> Stakeholders workshop**

In total, 21 feedback forms were returned.

## 2.2 6th Stakeholders Workshop Exploitation of FOT results

[http://www.fot-net.eu/en/networking/stakeholders\\_meetings/fot-net\\_6th\\_stakeholders\\_workshop\\_download\\_presentations.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/fot-net_6th_stakeholders_workshop_download_presentations.htm)

### 2.2.1 Agenda

<b>09:30</b>	<b>Coffee and registrations</b>	
	<b>Setting the scene &amp; FOT-Net's activities</b>	
<b>10:00</b>	Meeting objectives	Irina Silva, ERTICO – ITS Europe
<b>10:05</b>	Current and future EC-funded FOT and pilot activities	Juhani Jääskeläinen, European Commission
<b>10:15</b>	Revised FESTA methodology & newly launched Working Groups FOT-Net seminars	Yvonne Barnard, University of Leeds
<b>10:25</b>	Inventory of Tools for FOTs	Adrian Zlocki, IKA
<b>10:35</b>	Stakeholders needs analysis: methodology and start of survey	Christhard Gelau, BAST
<b>10:45</b>	Q&A	
<b>10:50</b>	<b>Break</b>	
	<b>Exploitation of FOT results: expectations from the stakeholders</b> <i>Presentations will be followed by Q&amp;A</i>	Moderator: Maxime Flament, ERTICO – ITS Europe
<b>11:00</b>	Views from a policy maker: <ul style="list-style-type: none"> <li><i>How will the results be used?</i></li> <li><i>How to influence high level change based on the results.</i></li> <li><i>Comments on exploitation mechanisms.</i></li> </ul>	Lars Tysklind, Committee on Transport and Communications, Member of Swedish Parliament
<b>11:15</b>	Views from a region: <ul style="list-style-type: none"> <li><i>Same as above</i></li> <li><i>What benefits FOTs can bring to the region?</i></li> </ul>	Gerbrand Klijn, Province of Noord-Brabant
<b>11:30</b>	Views from a user/industry player: <ul style="list-style-type: none"> <li><i>Your impressions of being in a Pilot.</i></li> <li><i>Are improvements needed in what regards future involvement of fleets in EU funded Pilots? E.g. simplifying administration, etc.</i></li> <li><i>What has been the return on the investment made?</i></li> <li><i>The Pilot has ended, how will the results be</i></li> </ul>	Jo van Hoef, Chief of Helmond Fire Brigade

	<i>used/exploited? (main topic of presentation)</i>	
<b>11:45</b>	Q&A	
<b>12:00</b>	<b>Lunch &amp; Networking</b>	
	<b>Exploitation plans</b> <i>Presentations and Panel discussion</i>	Moderator: Kevin Borrás, H3B Media Ltd.
<b>13:00</b>	Stakeholder from euroFOT <ul style="list-style-type: none"> <li>• <i>What will be done to ensure deployment?</i></li> <li>• <i>What kind of needs does the project respond to?</i></li> <li>• <i>What is the expected project result?</i></li> <li>• <i>Who are the final or potential users or beneficiaries of the project's outcomes?</i></li> <li>• <i>Exploitation activities and means used</i></li> </ul>	Aria Etemad, Ford Research & Advanced Engineering Europe
	Stakeholder from TeleFOT <ul style="list-style-type: none"> <li>• <i>Same as above</i></li> </ul>	Stéphane Dreher, NAVTEQ
	Stakeholder from DRIVE C2X <ul style="list-style-type: none"> <li>• <i>Same as above</i></li> </ul>	François Fischer, ERTICO – ITS Europe
	Stakeholder from FOTsis <ul style="list-style-type: none"> <li>• <i>Same as above</i></li> </ul>	Emilio Cacheiro, OHL Concesiones
	<i>Panel Discussion and Questions from the Audience</i>	
<b>14:15</b>	<b>Coffee break</b>	
	<b>ITS Innovation incubators</b> <i>Presentations will be followed by Q&amp;A</i>	Moderator: Maxime Flament, ERTICO – ITS Europe
<b>14:30</b>	Helmond Test Bed	Joelle van den Broek, Dutch Integrated Testsite Cooperative Mobility
<b>14:45</b>	Defining a large scale action	Stefanos Gouvrás, European Commission
<b>15:00</b>	SATIE, Support Action for Transport – ICT European large scale action	Wil Botman, ANWB
<b>15:15</b>	Q&A	
<b>15:20</b>	<b>Wrap-up</b>	
<b>15:30</b>	<b>Adjourn</b>	

## 2.2.2 Introduction

FOT-Net stakeholders workshops provide a forum for cooperation, discussion and information exchange, addressing FOT issues that have been identified as of high-priority to the stakeholders. European players interested in FOTs can use this medium to share

information about planning, developments and results of trials which are being carried out at European and national levels.

FOT-Net's "Common Roll-out plan to support coherent development and implementation of FOTs" ([http://www.fot-net.eu/download/Deliverables/fotnet\\_d22\\_v03.pdf](http://www.fot-net.eu/download/Deliverables/fotnet_d22_v03.pdf)) serves as guidance to setting-up the agenda of the Stakeholders workshops. However FOT-Net remains open and will listen to requests from the FOT community to tackle important issues that may arise. Feedback can be sent via the FOT Wiki or directly to [info@fot-net.eu](mailto:info@fot-net.eu).

The theme of the 6<sup>th</sup> Stakeholders workshop was "*Exploitation of FOT results*". FOTs are a product on their own right but they are also a resource and a tool that can be used by stakeholders that were not directly involved in the execution of the FOT. Namely, FOT results will be used by policy makers to support their policy decisions and by industry players to make informed decisions about market introduction.

At their start FOT projects usually define an exploitation plan that draws attention to the value of the FOT that defines how to get the most out of the findings, at how to make the results live beyond the end of the FOT and ultimately make the link with ITS deployment.

In this edition of the Stakeholders workshop:

- Stakeholders from within and outside the FOT community discussed their specific expectations from FOT results and how it is ensured that they can exploit the results.
- Examples of exploitation plans of FOTs were presented and existing processes of transferring the results discussed.
- Stakeholders draw recommendations towards the sustainability of FOT results and how past experience can be capitalised.

In addition, the concept of innovation incubators was discussed, more specifically the use of test beds as an environment to evaluate ITS applications and also as a multi-stakeholders meeting point to explore new ITS solutions. The newly kicked-off EC funded project SATIE (Support Action for Transport – ICT European large scale action) discussed its plans for the definition of implementation schemes for pan-European test beds, incubators and services.

FOT-Net also took this opportunity to report on its activities namely the revision of the FESTA methodology, seminars, new working groups, tools for FOTs, and stakeholder's needs analysis.

All presentations are available online:

[http://www.fot-net.eu/en/networking/stakeholders\\_meetings/fot-net\\_6th\\_stakeholders\\_workshop\\_download\\_presentations.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/fot-net_6th_stakeholders_workshop_download_presentations.htm)

### **2.2.3 Setting the scene and FOT-Net activities**

#### **Meeting objectives and FOT-Net overview**

Irina Silva (ERTICO –ITS Europe) opened the meeting with stating the objectives. She stated three keywords to today's workshop: Exploitation, mainstreaming and multiplication.

- How can FOT results be exploited as resources in the hands of others?

- How will we mainstream what has been found by the FOTs? In other words what are the processes in place for transferring the results?
- How can we multiply the findings, or in other words, what is the planned process for convincing the stakeholders to apply the results?

To address these questions, first expectations from stakeholders towards the results were to be presented.

The partners from 4 FOTs were invited to share their exploitation plans, two pan-European FOTs which are close to their end and two pan-European FOTs which have kicked-off this year.

At the end of today's workshop the aim was to understand if the expectations are being met by the plans of the FOT experts, and to draw recommendations on how we can make FOT results live beyond the end of the project.

FOT-Net is cooperating with this workshop also with the new EC project SATIE. We aim to learn more today about concepts of large scale actions and innovation incubators.

### **Revised FESTA methodology and newly launched Working Groups**

Yvonne Barnard (University of Leeds) presented the new revision of the FESTA handbook, which was finalised in September 2011. Usability was improved, e.g. by using hyperlinks. Chapters were updated based on lessons-learned from seminars, workshops and FOT projects. Main issues related to dealing with complexity of FOTS, such as combination of functions, generation of hypotheses and research questions, pilot studies, data analysis and storage, socio-economic impact assessment, and legal and ethical aspects.

The FESTA handbook can now also be used from the perspective of: Cooperative systems, Nomadic Devices, and Naturalistic Driving Studies

In September five working groups were launched in order to generate new knowledge to be used for further updates of FESTA:

- Data analysis
- Events and incident definition
- Ethical and legal issues
- Impact assessment and scaling up
- Data sharing

All working groups are open to those who are interested. Communication and consultation will take place via mailing lists, webinars and workshops. The working groups will formulate recommendations for FESTA and report at stakeholder workshops.

### **Inventory of tools for FOTs**

Adrian Zlocki (IKA) reported on the collection of the descriptions of tools that are useful in FOTs. The following categories of tools can be distinguished:

- Tools for data acquisition
- Tools for data base structure and data management
- Tools for data analysis

- Other tools (travel diary, questionnaire etc.) with focus on driver

All tool descriptions will be placed in the FOT-Net wiki, in the specially created tools section.

You can add your own descriptions!

[http://wiki.fot-net.eu/index.php?title=Tools\\_for\\_FOTs](http://wiki.fot-net.eu/index.php?title=Tools_for_FOTs)

### **Stakeholders needs analysis: methodology and start of survey**

Christhard Gelau (BAST) presented the stakeholder needs analysis work in WP6 of FOT-Net. A Stakeholder is a person or an organisation who could give support to FOTs and/or could be affected by FOT results. Past and current FOTs are often lacking a balanced representation of stakeholders. If we want to reach deployment this balance is crucial.

FOT-Net is currently exploring and mapping the needs of the stakeholders by a targeted consultation of those stakeholders who are actively involved (“actors”) and those who are not. A methodological approach is taken, qualitative expert interviews are conducted by means of an online questionnaire. The objectives are: exploration of awareness, past experiences, expectations and motives for active involvement or reserve.

### **2.2.4 Exploitation of FOT results: expectations from the stakeholders**

In this session, moderated by Maxime Flament (ERTICO – ITS Europe), different types of stakeholders were asked to give their point of view on their expectations with regard to exploitation of the results of FOTs.

#### **Views from a policy maker**

Lars Tysklind, Member of Swedish Parliament on the Committee on Transport and Communications, addressed the following questions:

- How will the results be used?
- How to influence high level change based on the results.
- Comments on exploitation mechanisms

What politicians need are scientific facts, but that are easy to communicate, and directions for deployment. The role of the public opinion is crucial in politics. Policy makers have to make priorities in spending public funds. Results can be used in different ways: maybe legislation and standards can be made, but also incentives are a good instrument.

#### **Views from a region**

Gerbrand Klijn (Province of Noord-Brabant) gave his point of view, based on the experience in Noord-brabant with pilots and FOTs. Pilots and FOTs conducted are:

- Cooperative information between trucks and traffic lights (CVIS)
- Real-time bus information on smartphones
- Truck navigation
- GPS-based tolling system
- CAN-bus reading and GPS info
- ‘Green and blue’ zone – Incar system
- GPS-tolling FOT with real-time MM travel information on smartphones

These tests are performed because they provide a temporary solution to concrete problems, influencing decision makers to go for deployment or adaptation. Other goals are: agenda setting, providing showcases to raise awareness (addressing hearts and minds) and image building with regards to economic interests.

If you want to influence high-level change, it is best to address both professionals and politicians. For this last group: go for their ambition. Professionals would like to build on their expertise and can be risk-avoiding. In times of crisis the room for experiments is less, so try to solve concrete problems.

Jo van Hoef, Chief of the Helmond Fire Brigade, also gave his view on being involved in the Helmond pilots. For the fire brigade this has been a very positive experience. It is clear that stakeholder involvement is crucial for the success of a pilot or FOT.

### **2.2.5 Exploitation plans**

In this session Kevin Borrás (H3B Media Ltd) moderated presentations and discussions on the exploitation of FOT results. Stakeholders from different European projects gave their input. They answered the following questions:

- What will be done to ensure deployment?
- What kind of needs does the project respond to?
- What is the expected project result?
- Who are the final or potential users or beneficiaries of the project's outcomes?
- Exploitation activities and means used

Details about their exploitation plans and activities can be found in their presentations.

#### **Stakeholder from euroFOT**

Aria Etemad (Ford Research & Advanced Engineering Europe) presented the euroFOT exploitation plans. There are three ways the results are used. (1) By the marketing departments of the partners, (2) via EUCAR, CLEPA, and EARPA, and (3) by government authorities (e.g. law enforcement, ICTS-2). The project contributes to better understanding of driver workload, user acceptance, and usability of ADAS. It improves public awareness on driver support. Finally the project contributes to a harmonized approach of FOT methods.

The final or potential users or beneficiaries of the project's outcomes are:

- Automotive industry in Europe
- Decision makers in public sector e.g.:
  - Road authorities
  - Legislation
  - Law enforcement
- Road users
- New vehicle customers
- User interest groups e.g. ADAC

### **Stakeholder from TeleFOT**

Stephane Dreher (NAVTEQ) presented the TeleFOT project. TeleFOT is aimed at assessing, via Field Operation Tests, the impacts of aftermarket and nomadic devices in vehicles for driver support and raise wide awareness of their functions and potential.

FOTs can support data-based traffic-related public policies and services and nomadic improvements. Safety impact in nomadic devices (e.g. distraction) is the highest priority that TeleFOT could allow to understand. Relevance is also addressed in understanding how Nomadic Devices support reduction of traffic congestion. Results of the project can promote standardization in Nomadic Devices (e.g. safer positioning into vehicles). Some inputs for future: deeper interoperability, real time information and dynamic maps with enhanced and reliable features.

### **Stakeholder from DRIVEC2X**

Francois Fischer (ERTICO – ITS Europe) presented the DRIVEC2X project, focussing on standards and interoperability. DRIVE-C2X paves the road from standards to deployment, providing “generic” implementations of standards, and it specifies and implements additional required components, which are not part of the standards. In order to ensure deployment it is necessary to use and promote conformance and interoperability testing.

The expected results are:

- Prove the applicability of ITS cooperative standards
  - Showing a straightforward way to implement cooperative driving solutions in vehicles and road side infrastructure
  - Demonstrating the interoperability in the V2V and I2V perspectives
- Easily carry on FOT operations
  - Proving the possibility of a seamless introduction of cooperative driving functions I vehicles and infrastructure, in particular during the naturalistic tests
- Positive evaluation of cooperative driving benefits

### **Stakeholder from FOTsis**

Emilio Cacheiro (OHL Concesiones) presented the FOTsis project. FOTsis is focused on infrastructure and road operation: complementary to existing FOTs which are mainly focused on vehicles. The infrastructure needs to be adapted to cooperative services requirements. Road infrastructure management systems need to be tested (FOT) and integrated into the common European Communication Architecture for service provision.

Infrastructure operators would benefit from cooperative services, providing a safer, more intelligent and more sustainable road operation. FOTsis develops business models to address Cooperative Services deployment.

## **2.2.6 ITS Innovations incubators**

Maxime Flament (ERTICO – ITS Europe) moderated the final session on ITS Innovations incubators.

## Helmond Test Bed

Joelle van den Broek (TNO) presented the Dutch Integrated Testsite Cooperative Mobility. DITCM is a collaboration on cooperative mobility, aiming to accelerate new mobility concepts and solve mobility problems. For excellent and efficient development, collaboration is needed, shared facilities and a shared roadmap. DITCM has three programme lines:

- The human factors in using cooperative systems
- Development Environment for cooperative systems
- Effect Studies

## Defining a large scale action

Stefanos Gouvras (European Commission) presented the European plans for large scale actions to deploy transport-ICT in Europe. With the recognition that the public sector can play an important role in driving research and innovation and opening up new markets for innovative products and services, and to speed up the achievement of specific societal goals, the EC is considering how to support a set of focused projects of significant scale and duration that cut across the innovation cycle to develop modern pan-European service infrastructures. These initiatives, tentatively called **European Large Scale bridging Actions (ELSAs)** will mobilise a critical mass of resources, including grants for R&D, pre-commercial procurement and support for innovation and deployment.

European Innovation Partnerships should be launched to accelerate research, development and market deployment of innovations to tackle major societal challenges, pool expertise and resources and boost the competitiveness of EU industry, starting with the area of healthy ageing. By 2020, and taking 2010 as a baseline, the aim is to support a number of pioneering European cities (with a total population of at least 20 million) in reducing their carbon emissions by more than 20%, increasing the share of renewable energy in the energy used for electricity supply, heating and cooling by 20%, and increasing end-use energy efficiency by 20%. The Partnership will demonstrate the feasibility of rapid progress towards the EU's energy and climate objectives at local level ... including more efficient urban transport.

Large-Scale Test Bed is considered to be essential for the take-up of innovative new ICT technologies in transport, and they build the bridge between research and full-scale deployment. For the Test Bed, we need to identify networks of appropriate test areas among and within the candidate cities and/or transport corridors, fulfilling the criteria on the side of economic activities (e.g. manufacturing, service, recreational, industrial districts/sectors), co-modal connectivity (e.g. linking motorways/railways/waterways with city transport networks), urban mobility attributes, infrastructure characteristics and development capabilities. Test areas with cross border corridors and country-through traffic are preferred.

## SATIE, Support Action for Transport – ICT European large scale action

Wil Botman (ANWB) presented SATIE, the Support Action for Transport – ICT European large scale action.

ELSA (European Large Scale Action) was mentioned in EC Communication 'Raising the game' (2009) as a possible instrument to cut through the innovation cycle, to speed up implementation of new ITS applications, focussing on the demand side in the lead, instead of supply side. It is oriented towards societal goals, not products, and has broad areas of

application (safety, environment, efficiency, services), solutions (infrastructure, vehicles, cooperative, internet), and geography (European test-beds).

SATIE will develop the ELSA Handbook, address the assessment of the effects of ELSA and organise several high-level meetings. Their main outcome will be a successful launch of an ELSA (e.g. as an European Innovation Partnership) of ICT for sustainable mobility and transport.

### **2.2.7 Wrap-up**

Irina Silva (ERTICO – ITS Europe) wrapped up the workshop.

The European Commission has the following expectations:

- Understand how to exploit the data that was collected in FOT
- Understand how we can share data namely with US and Japan
- Need for methodology on the exchange of data? Clarify open issues (IPR, accessibility...)
- Develop a data coordination plan

The EC is willing to support if research needs arise. The FOT-Net Data Sharing Working Group can play an important role in this.

Lessons learned from this workshop are:

- Make decision makers enthusiastic about your idea
- Work on image building
- Use showcases
- Politicians: go for their ambition to get them on board!
- Use of public authorities as medium to pass message (local champion)
- Don't leave the dissemination and exploitation to the end of the project: generate a build-up

There are several ways to disseminate and exploit results:

- Use of classical means of exploitation (web, presentations, events...)
- Marketing & use of mainstream media
- C2X FOTs bring new challenges to exploitation:
  - use of prototypes, not commercially available
  - need to remove fears from the public (control, enforcement...)
- Standardisation + Interoperability
- Showcases, local events (GCDC, Plug Tests, ...)

The following conclusions concerning the ITS Innovation Incubators were drawn. DITCM may be a reference for other European Test Sites. Defining large scale actions will lead to large projects cutting across the innovation cycles, and the EC has several initiatives in place to stimulate innovation. ELSAs will bring a need for demand driven objectives, and test beds targeted to well-defined technological areas.

### **2.2.8 Participants list**

**Table 3 List of participants 6<sup>th</sup> stakeholders workshop**

Organization	First name	Last name
<b>ACEM</b>	Veneta	Vassileva
<b>ANWB</b>	Wil	Botman
<b>ASFA</b>	Gwenaëlle	Toulminet
<b>BASt</b>	Christhard	Gelau
<b>Chalmers University of Technology</b>	Stig	Franzen
<b>DEKRA e.V.</b>	Viktoria	Tchetchik
<b>DG INFSO</b>	Eva	Boethius
<b>ERF</b>	Concetta	Durso
<b>ERTICO - ITS Europe</b>	François	Fischer
<b>ERTICO - ITS Europe</b>	Maxime	Flament
<b>ERTICO - ITS Europe</b>	Mieke	van der Leegte
<b>ERTICO - ITS Europe</b>	Zeljko	Jeftic
<b>ERTICO - ITS Europe</b>	Sébastien	Mure
<b>ERTICO - ITS Europe</b>	Laetitia	Fernandez
<b>ERTICO - ITS Europe</b>	András	Csepinszky
<b>ERTICO - ITS Europe</b>	Irina	Silva
<b>European Commission</b>	Stefanos	Gouvras
<b>European Commission</b>	Pawel	Stelmaszczyk
<b>European Commission</b>	Helen	Köpman
<b>European Commission</b>	António	Colaço
<b>European Commission</b>	John	Berry
<b>European Commission</b>	Juhani	Jääskeläinen
<b>European Commission</b>	Myriam	Coulon Cantuer
<b>European Transport Safety Council</b>	Julie	Galbraith
<b>Ford Research &amp; Advanced Engineering Europe</b>	Aria	Etemad
<b>Ford Research &amp; Advanced Engineering Europe</b>	Christoph	Kessler
<b>H3B Media Ltd.</b>	Kevin	Borras
<b>IKA</b>	Adrian	Zlocki
<b>Market Up, c/o CLEPA</b>	Bjoern	Hedlund
<b>MLC ITS Euskadi</b>	Fernando	Zubillaga
<b>NAVTEQ</b>	Stéphane	Dreher
<b>OHL Concesiones</b>	Emilio	Cacheiro
<b>Province of Noord-Brabant</b>	Gebrand	Klijn
<b>Swedish Parliament - Committee on Transport and Communications</b>	Lars	Tysklind
<b>TNO</b>	Joëlle	van den Broek
<b>TNO</b>	Eline	Jonkers
<b>University of Leeds</b>	Yvonne	Barnard
<b>Veiligheidsregio Brabant-Zuidoost</b>	Jo	Van Hoef
<b>Veiligheidsregio Brabant-Zuidoost</b>	Joost	Janssen

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Number of participants	39
Number of women – men	13 - 26
Associations/user groups/European Commission	19
Industry	7
Universities/research organisations	5
Road operators/public authorities	7
Other/unknown	1

## 2.3 Coordination day on cooperative systems / 7th Stakeholders Workshop Key issues related to Cooperative Systems FOTs

### 2.3.1 Agenda

09:30	Coffee and registrations	
10:00	Meeting objectives	Juhani Jääskeläinen, European Commission
10:10 – 12:00	<b>Session 1 – Interoperability of Cooperative Systems and feedback to standards</b> <ul style="list-style-type: none"> <li>- What are the activities that we should put in place in order to ensure interoperability? Plugtest? Bilateral cooperation?</li> <li>- What is the level of interoperability needed in EU projects/in FOT test sites?</li> </ul>	Moderator: François Fischer, ERTICO – ITS Europe, COMeSafety2, DRIVE C2x
10:10	DRIVE C2X Reference system	Long Le, NEC, DRIVE C2X
10:20	FOTsis Reference system	Federico García-Linares, OHL Concesiones, S.A., FOTsis
10:30	The PRESERVE V2X Security Subsystem and Opportunities for Joint Testing	Frank Kargl, University of Twente, PRESERVE
10:40	IPv6 implementation of ETSI/ISO's ITS station reference architecture	Thierry Ernst, INRIA, ITSSv6
10:50	Report on Plugtest and future activities	Long Le, NEC, DRIVE C2X
11:00	EU-US convergence	Gérard Segarra, Renault, COMeSafety2
11:10	Inputs from SISCOGA, SCORE@F	Rosa Blanco, CTAG, SISCOGA Gérard Segarra, Renault, SCORE@F
11:20	Discussion & Conclusions	
11:50 – 12:00	Break	

12:00 – 13:30	<b>Session 2 – Data Sharing</b> <ul style="list-style-type: none"> <li>- <i>Can we agree on general principles for sharing data? Between FOTs? Between EU and US?</i></li> <li>- <i>Are there legal and ethical issues related to data sharing of CS FOTs? (As compared to ADAS FOTs)</i></li> <li>- <i>What are the necessary elements to put in place in order to really achieve practical data sharing?</i></li> </ul>	Moderator: Helena Gellerman, SAFER/Chalmers, FOT-Net
12:00	Data sharing principles	Helena Gellerman, SAFER/Chalmers, FOT-Net
12:10	Data flow and sharing within and outside DRIVE C2X	Thomas Benz, PTV, DRIVE C2X
12:20	Data flow and sharing within and outside FOTsis	Enrique Gómez, SICE, FOTsis
12:30	Report on the EU-US Task force activities	Wolfgang Höfs, European Commission
12:40	Inputs from SISCOGA, SCORE@F	Rosa Blanco, CTAG, SISCOGA Gérard Segarra, Renault, SCORE@F
12:50	Discussion & Conclusions	
13:30 – 14:00	Lunch	
14:00 – 15:00	<b>Session 3 – Dissemination of Cooperative Systems' benefits through cooperation between FOTs at EU and international level</b> <ul style="list-style-type: none"> <li>- <i>Is there a possibility to jointly disseminate the results of the FOTs? How much can be done jointly?</i></li> <li>- <i>Could this also be done at EU-US level? At national level?</i></li> <li>- <i>Should we already plan today what we can disseminate jointly once the results are available?</i></li> </ul>	Moderator: Maxime Flament, ERTICO – ITS Europe, FOT-Net
14:00	Ideas for joint dissemination of results from DRIVE C2X's point of view	Tanja Kessel, EICT, DRIVE C2X
14:10	Ideas for joint dissemination of results from FOTsis' point of view	Irene Fusco, ERF, FOTsis
14:20	Inputs from SISCOGA, SCORE@F	Rosa Blanco, CTAG, SISCOGA Gérard Segarra, Renault, SCORE@F
14:30	Discussion & Conclusions	

15:00	Break	
15:10 – 16:10	<b>Session 4 – Deployment prospects</b> <ul style="list-style-type: none"> <li>- <i>How do different projects plan to bring their results to real deployment?</i></li> <li>- <i>How do different projects plan to turn their results into deployment?</i></li> </ul>	Moderator: Paul Kompfner, ERTICO – ITS Europe, COMeSafety2
15:10	DRIVE C2X	Tanja Kessel, EICT, DRIVE C2X
15:20	FOTsis	Miguel Seisededos, Iridium, FOTsis
15:30	PRESERVE	Frank Kargl, University of Twente, PRESERVE
15:40	ITSSv6	Thierry Ernst, INRIA, ITSSv6
15:50	Inputs from SISCOGA, SCORE@F	Rosa Blanco, CTAG, SISCOGA Gérard Segarra, Renault, SCORE@F
16:00	Discussion & Conclusions	
16:20	Closing remarks and next steps	Wolfgang Höfs, European Commission
16:30	Adjourn	

### 2.3.2 Workshop Objectives

The aim of the Coordination Day for Cooperative Systems FOTs was to provide a forum for discussion for EC-funded projects working in this domain. The workshop was not restricted to FOTs. Other EC-funded projects, for instance CIP Pilots, were encouraged to attend this workshop.

More specifically, the objectives of the workshop were to build stronger cooperation between the projects, harmonise activities, discuss joint testing opportunities and map future cooperation.

Four key areas were identified for discussion:

- Interoperability of Cooperative Systems and feedback to standards
- Data Sharing
- Dissemination of Cooperative Systems benefits through cooperation between FOTs at EU and international level
- Deployment prospects

FOT-Net provided support to the EC – DG INFSO in the organisation of this workshop and serves as rapporteur.

Juhani Jääskeläinen (European Commission), opened the workshop giving the following considerations:

Under FP7 objectives, the EC – DG INFSO – Unit ICT for Transport has a portfolio of 60 projects, with funding of 200 million Euros. More calls will be opening later this year. Part of those calls will be dedicated to FOT activities with an estimated 50 million Euros. This investment is quite unique as there is nothing similar elsewhere.

This reasoning behind this workshop is that good results are being achieved by the FOT projects and the EC sees a need to share these results among the projects. There is already information exchange however it can be made better. This is related not only to FOTs, it needs to be taken into account in a wider sense. Data sharing is absolutely crucial for us, the EC wants to re-use the data that is collected by the FOTs.

In what regards dissemination: there should be more concrete plans on how to better disseminate the valuable results resulting from the FOT activities.

Regarding the international activities: the EC has been very active in international cooperation with Japan, China and others. Most significant has been the cooperation with the US. Twice per year the EC has F2F meetings and phone calls, during which issues such as assessment tools and standardisation are discussed. The last meeting took place in January and more will take place in June at the time of the euroFOT final event. Wolfgang Höfs gave a presentation on EU-US activities during the data sharing session. The EC is also interested in having this type of cooperation with Japan but the type of data being collected there is not similar, as it is mostly collected by individual OEMS and the focus has been more on probe data.

An interesting question for consideration the follow-up of the activities in the context of Horizon 2020. The whole set up is ongoing, preparatory work has been done namely by the SATIE project, by looking at how to shorten the cycle of research towards deployment. This is now a new discussion but what is important to look at is how piloting and FOTs can contribute to this discussion.

***The statements made below appearing with an arrow are the views of FOT-Net.***

### **2.3.3 Session 1 – Interoperability of Cooperative Systems and feedback to standards**

This session was moderated by François Fischer (ERTICO – ITS Europe) representing COMeSafety2 and DRIVE C2X.

The questions addressed during this session were:

- What are the activities that we should put in place in order to ensure interoperability? Plugtest? Bilateral cooperation?
- What is the level of interoperability needed in EU projects/in FOT test sites?

During this session the following speakers gave presentations:

DRIVE C2X Reference system	Long Le, NEC, DRIVE C2X
FOTsis Reference system	Federico García-Linares, OHL Concesiones, S.A., FOTsis
The PRESERVE V2X Security Subsystem and Opportunities for Joint Testing	Frank Kargl, University of Twente, PRESERVE
IPv6 implementation of ETSI/ISO's ITS station reference architecture	Thierry Ernst, INRIA, ITSSv6
Report on Plugtest and future activities	Long Le, NEC, DRIVE C2X
EU-US convergence	G�rard Segarra, Renault, COMeSafety2
Inputs from SISCOGA, SCORE@F	Rosa Blanco, CTAG, SISCOGA G�rard Segarra, Renault, SCORE@F

## Discussion

- Among FOT projects, there is no agreement on what or who should be interoperable. There are different definitions of cooperative systems between the different projects.
  - ➔ FOT projects should use a clear common view on the communication stack in accordance to the standards on cooperative systems
  - ➔ FOT projects should map which standards are being implemented in their reference systems
  - ➔ FOT projects should plan compliancy/interoperability checks over the project lifetime
- As the standards are evolving, the FOT projects should have a constant exchange and iterative process in direct link with the standardisation.
  - ➔ FOT Projects should report directly to standardisation bodies and contribute interactively in the standardisation process
  - ➔ FOT projects should make sure that standardisation bodies are more aware of what is being promised and achieved in the project with the aim of aligning timelines and roadmaps
- Interoperability events should be considered as a tool to check interoperability at different level of the communication stack.
  - ➔ FOT projects should make an interoperability plan and express to the interoperability event organisers what are the parts of the stack they would like to test in the next 2-3 interoperability events
- What is the role of COMeSafety?

- COMeSafety should play a central role to foster interoperability among FOTs and other activities at EU, national and US-JPN level.

**Action: FOT-Net and/or COMeSafety should organise a follow-up closed workshop with FOT project representatives on the topic of interoperability and standardisation.**

### **2.3.4 Session 2 – Data Sharing**

This session was moderated by Helena Gellerman (SAFER/Chalmers) representing FOT-Net.

The questions addressed during this session were:

- Can we agree on general principles for sharing data? Between FOTs? Between EU and US?
- Are there legal and ethical issues related to data sharing of CS FOTs? (As compared to ADAS FOTs)
- What are the necessary elements to put in place in order to really achieve practical data sharing?

During this session the following speakers gave presentations:

Data sharing principles	Helena Gellerman, SAFER/Chalmers, FOT-Net
Data flow and sharing within and outside DRIVE C2X	Thomas Benz, PTV, DRIVE C2X
Data flow and sharing within and outside FOTsis	Enrique Gómez, SICE, FOTsis
Report on the EU-US Task force activities	Wolfgang Höfs, European Commission
Inputs from SISCOGA, SCORE@F	Rosa Blanco, CTAG, SISCOGA Gérard Segarra, Renault, SCORE@F

### **Discussion**

- All agreed that FOTs can share details but the details of how to carry this need to be defined.
  - FOT-Net Data Sharing WG will detail the data sharing principles – all are welcome to join the discussions
- Data can be shared at different levels: within the project, between the projects, between continents and between communities (such as researchers).
- In the context of Cooperative Systems FOTs, all participants agree to share data.

- An international common platform is planned as the basis for data sharing; guidelines need to be defined that gives project partners trust and security when sharing their data.
- Common guidelines could be used even for situations when data is being shared bilaterally. Thus avoiding having bilateral agreements need to be written each time you would like to share data.
  - ➔ All participants agree on the principle of an international common platform based on the data sharing principles
- In terms of the format of an international common platform for data sharing: data is more easily shared when this is done at a higher level. There is reluctance to share data when you focus on the quality of the systems under test. Each FOT could open an international window with a pre-defined format. FOTs would not provide access to all of their raw data, access would be given to more elaborate data.
  - ➔ FOT projects should make clear at what level of details they agree to share data
  - ➔ Collected data being shared by FOT projects should be detailed enough in order to allow new innovative research based the data eventually answering new research questions and hypotheses
- One issue to consider is how can we maintain such a platform? Who will be willing to contribute? What is feasible with the resources that projects have.
  - ➔ FOT projects should plan of maintaining the collected data after the project
- Legal and ethical issues: when it comes to Cooperative Systems FOTs, the rules are the same in what concerns the usage of video and GPS, but with Cooperative Systems FOTs information is broadcasted and this opens other elements such as liability issues. There is common law in the EU that allows sharing data within the EU. Consent forms are needed in which you explain to the subjects the dangers about the data and how the data will be used.
- Further discussion is needed on data sharing agreements. This matter will be further discussed within FOT-Net's data sharing WG. Data sharing has been discussed within FOT-Net in the past and the WG will put together all this information into a report and open discussion will continue at the FOT-Net international workshop in Vienna. All are invited to participate. Participants of the Coordination Day will be invited to become a member of the WG either as Core group or Reference group.

**Action: FOT-Net to invite coordination day participants to become part of the Data sharing WG (either as members of the Core Group or Reference Group).**

### ***2.3.5 Session 3 – Dissemination of Cooperative Systems' benefits through cooperation between FOTs at EU and international level***

This session was moderated by Maxime Flament (ERTICO – ITS Europe) representing FOT-Net.

The questions addressed during this session were:

- Is there a possibility to jointly disseminate the results of the FOTs? How much can be done jointly?
- Could this also be done at EU-US level? At national level?
- Should we already plan today what we can disseminate jointly once the results are available?

During this session the following speakers gave presentations:

Ideas for joint dissemination of results from DRIVE C2X's point of view	Tanja Kessel, EICT, DRIVE C2X
Ideas for joint dissemination of results from FOTsis' point of view	Irene Fusco, ERF, FOTsis
Inputs from SISCOGA, SCORE@F	Rosa Blanco, CTAG, SISCOGA Gérard Segarra, Renault, SCORE@F

## Discussion

- Dissemination can be undertaken jointly between projects but doing so may prevent wider dissemination. At the same time having several awareness activities that are not coordinated may actually not be beneficial in passing the message to the stakeholders: they are being presented several solutions, how can they discern and understand them? Are there conflicts on what is being promoted? So some activities should be carried out in common and strategy needs to be defined on how and what to communicate to the decision makers.
- The Cooperative Systems demonstration which will happen at the ITS Congress in Vienna (2012) was given as a best practice. Different projects are coming together, they have defined on a joint message. Decision makers will be one of the targets of this demo, the Ministers attending the Ministerial Round at the Vienna ITS Congress are invited to see what can be deployed.
- The events organised by the FOTs should be more targeted having clearly in mind which audience they are targeting, what message they would like to convey and clarify the benefits. Avoid having succession of presentations and focus on the stakeholders experience in common demonstrations. This should also be the opportunity to promote the discussion of business plans with public authorities and other relevant stakeholders.
  - ➔ FOT participants should participate to the events organised by other FOT projects
  - ➔ FOT projects should share their dissemination plan

- FOT projects should plan well in advance common demonstrations
- FOT projects should plan to attend the FOT-Net stakeholder workshop, seminars and international meetings.
- FOT-Net has put in place tools to support the FOTs in their dissemination tasks. A liaison group was set up in 2011 in which FOTs share their activities. The work of the dissemination group could become more active with the organisation of regular conference call. In addition a Dissemination Guide was issued to support the dissemination of FOT projects in Europe.
  - FOT projects should read the “FOT-Net dissemination blueprint” to identify how they can use FOT-Net to promote their results

**Action: FOT-Net to add the dissemination representatives to the dissemination liaison group (in addition to the project coordinator).**

**Action: FOTs to organise a joint dissemination activity in 2013. FOT-Net will take the lead.**

### **2.3.6 Session 4 – Deployment prospects**

This session was moderated by Paul Kompfner (ERTICO – ITS Europe) representing COMeSafety2.

The questions addressed during this session were:

- How do different projects plan to bring their results to real deployment?

During this session the following speakers gave presentations:

DRIVE C2X	Tanja Kessel, EICT, DRIVE C2X
FOTsis	Miguel Seisdedos, Iridium, FOTsis
PRESERVE	Frank Kargl, University of Twente, PRESERVE
ITSSv6	Thierry Ernst, INRIA, ITSSv6
Inputs from SISCOGA, SCORE@F	Rosa Blanco, CTAG, SISCOGA G�rard Segarra, Renault, SCORE@F

### **Discussion**

- There isn't a natural succession as we get closer to deployment. How can the FOT as a group prepare for deployment? We should look at how to make the most of national trials

bringing value at European level. SATIE (European Large Scale Actions) is looking into this how FOTs can be taken into a larger scale.

- FOT projects should profit of their momentum to participate in CIP-PSP pilot projects and participate in efforts towards large scale actions in horizon 2020
- FOT projects which have built up a cooperative systems infrastructure should team up to become implementation reference for others
- A more creative and innovative approach could be brought into how the issue of deployment is dealt with. New actors not involved in the FOTs could be brought in to feed more ideas. Actors from business communities who have experience in deployment. We could focus on the small success stories.
  - The concept of “open platform” is a key to enable innovation in cooperative mobility.
  - FOT projects should identify the most obvious business cases for deployment and bring the right people around the table

### **2.3.7 Closing remarks and next steps**

Wolfgang Höfs (European Commission) closed the workshop. In his view the objectives of the workshop were achieved. Many topics were addressed and more time could have been given to each session. Follow-up meetings are clearly needed. These should be targeted in terms of topics, participants as well as the number of participants (smaller groups are more advisable).

The European Commission DGs MOVE/INFISO/ENTR will hold a Cooperative Systems workshop on 07 June. The results of the Coordination Day will feed into that workshop.

### **2.3.8 Action list**

Responsible	Action	Deadline
FOT-Net	FOT-Net and/or COMeSafety should organise a follow-up closed workshop with FOT project representatives on the topic of interoperability and standardisation.	2012
FOT-Net	FOT-Net to invite coordination day participants to become part of the Data sharing WG (either as members of the Core Group or Reference Group).	June 2012
FOT-Net	FOT-Net to add the dissemination representatives to the dissemination liaison group (in addition to the project coordinator).	June 2012
FOT-Net + FOTs (and	FOTs to organise a joint dissemination activity in 2013. FOT-Net will take the lead.	Q3 or Q4 2013

related projects)		
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### 2.3.9 List of participants

Table 4 List of participants 7<sup>th</sup> stakeholders workshop

Organisation	Last Name	First Name
ASFA	Toulminet	Gwenaëlle
AustriaTech	Froetscher	Alexander
CTAG, SISCOGA	Blanco	Rosa
EC DG INFSO	Boethius	Eva
EICT GmbH	Kessel	Tanja
ERF	Fusco	Irene
ERTICO - ITS Europe	Fischer	François
ERTICO - ITS Europe	Flament	Maxime
ERTICO - ITS Europe	Kompfner	Paul
ERTICO - ITS Europe	Silva	Irina
European Commission	Davila-Gonzalez	Emilio
European Commission	Gouvras	Stefanos
European Commission	Hoefs	Wolfgang
European Commission	Jääskeläinen	Juhani
European Commission	Köpman	Helen
European Commission, DG INFSO	Coulon Cantuer	Myriam
GMV	Herrera-Alcubilla	Ana
INDRA	Gil	Mauro
Iridium Concesiones de Infraestructuras	Seiseddos	Miguel
lesswire AG	Varadi	Andras
Mines ParisTech	Ernst	Thierry
NEC	Le	Long
OHL CONCESIONES	Garcia-Linares	Federico
PTV AG	Benz	Thomas
RENAULT	Segarra	Gérard
SAFER/Chalmers	Gellerman	Helena
SICE	Gomez Gonzalez	Enrique
TNO	Zwijnenberg	Han
Trialog	Kung	Antonio
Trialog	Sall	Michel
Universidad de Murcia	Skarmeta	Antonio
University of Twente	Kargl	Frank
University of Twente	Petit	Jonathan
Volvo Cars	Grönvall	John-Fredrik

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Number of participants	34
Number of women – men	10 - 24
Associations/user groups/European Commission	12
Industry	11
Universities/research organisations	9
Road operators/public authorities	1
Other/unknown	1

## 2.4 8th Stakeholders Workshop Lessons learned from Pilots on Cooperative Systems

[http://www.fot-net.eu/en/networking/stakeholders\\_meetings/fot-net\\_8th\\_stakeholders\\_workshop.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/fot-net_8th_stakeholders_workshop.htm)

### 2.4.1 Agenda

09:00 – 9:30	Welcome coffee and registrations	
9:30 – 11:00	<b><u>Setting the scene</u></b>	
9:30	Meeting objectives	Maxime Flament, ERTICO – ITS Europe
9:45	FOT-Net Working Groups: an update	Yvonne Barnard, ERTICO – ITS Europe
10:15	Form Panel - Tour de table & short introduction	
	Co-modality	Co-Cities: Alexander Frötscher, AustriaTech
	Traffic efficiency & sustainability	Compass4D: Siebe Turksma, Peek Traffic
		eCoMove: Philipp Gilka, DLR
	Safety	DRIVE C2X: Tapani Mäkinen, VTT
	Electromobility	smartCEM: Luca Pascotto, FIA
Framework for foundation of mobility services	MOBINET: Paul Kompfner, ERTICO – ITS Europe	
11:00 – 11:15	Coffee Break	
11:15 – 12:45	<b><u>Session 1 – Interoperability of deployed cooperative systems in the pilots</u></b> <ul style="list-style-type: none"> <li>- Is interoperability needed within and between pilots? What do pilots gain from interoperability?</li> <li>- How can we test interoperability? Should interoperability tests be organised across pilots?</li> <li>- How do you manage interoperability issues in your pilot, and what are they?</li> </ul>	Moderator: Hossein Zakizadeh, Volvo
12:45 – 13:45	Lunch Break	

13:45 – 15:15	<p><b><u>Session 2 – Data sharing</u></b></p> <ul style="list-style-type: none"> <li>- What can we gain from exchanging data?</li> <li>- Which data should be shared between pilots?</li> <li>- Are the pilots willing to share data?</li> <li>- How can we put data sharing into practice?</li> </ul>	Moderator: Helena Gellerman, SAFER
15:15 – 15:30	Coffee Break	
15:30 – 17:00	<p><b><u>Session 3 – Deployment &amp; business plans</u></b></p> <ul style="list-style-type: none"> <li>- What will be achieved in terms of deployment at the end of the pilot?</li> <li>- Should pilots join forces for promoting each other's successful deployment?</li> <li>- What can be reused from your deployment experience?</li> <li>- What added-value could a community of pilots bring?</li> </ul>	Moderator: Tom Alkim, RWS
17:00	Closing remarks and next steps	Wolfgang Hoefs, European Commission DG CONNECT
		Maxime Flament, ERTICO – ITS Europe
17:30	Workshop close	

### 2.4.2 Introduction

In the 8<sup>th</sup> edition of the Stakeholders Workshops, we took a closer look at what can be learned from past, current and recently launched pilots on Cooperative Systems. The benefits of Cooperative Systems towards safer and more efficient mobility have been documented in several national and European projects. Yet full-scale deployment of Cooperative Systems in Europe has not been reached due to a number of obstacles. Pilots can however bridge this gap and serve as the intermediary step between FOTs and deployment, testing and assessing Cooperative Systems applications before these can be deployed. In addition, by their very nature, pilots require that all value-chain stakeholders are involved in the pilots' roll-out.

The European Commission believes in the potential of pilots and has greatly invested in the running of pilots at pan-European level, in particular through the Competitiveness and Innovation Programme (CIP). To further promote deployment the European Commission stipulates to its funded pilots that the applications assessed remain in place after the pilot is completed.

What can we learn from these pilots? At the 8<sup>th</sup> FOT-Net Stakeholders Workshop several pilots funded by the European Commission were invited to discuss this topic and share their knowledge.

### **Meeting objectives**

Maxime Flament (ERTICO – ITS Europe) explained the structure and work being done in the FOT-Net support action. The objective of FOT-Net stakeholders meetings is to provide a forum for cooperation, discussion and information exchange. In this workshop we took a closer look at what can be learned from past and current pilots on cooperative systems. We are now in a phase where there is a shift from information exchange to discussion on what needs to be done to make deployment more successful.

Within CIP projects partners are funded by 50%, and they are willing to invest in deploying services that continue post-project. In previous workshops we discussed other cooperative system projects such as FOTsis and DRIVE C2X. This workshop on the other hand focused on the pilot projects, and especially on data sharing, interoperability and deployment.

### **FOT-Net Working Groups, stakeholder needs and seminars**

Yvonne Barnard (ERTICO – ITS Europe), who took over the coordination of FOT-Net from Irina Silva, explained the activities that are on-going in the working groups on Data Analysis, Events and Incident Definition, Legal and Ethical Issues, Impact Assessment and Scaling Up, and Data Sharing. The working groups are currently preparing their reports and feedback to the FESTA methodology, and will organise webinars in April or May to discuss their results. The groups on Legal and Ethical Issues already published their intermediate report (available on the [FOT-Net website](#)).

Results will also be presented at:

- Special session on Synergy between naturalistic driving studies and field operational tests, ITS European Congress, Dublin, 5 June 2013
- FOT-Net 6th International Workshop, Tokyo, 13-14 October 2013 (before the ITS World Congress)

WP6 on Stakeholder Needs Analysis presented their intermediate results. 55 stakeholders responded to the stakeholders' survey in 2012. These stakeholders come from a wide variety of backgrounds: industry, public authorities and research organisations. The majority of respondents who were involved in a FOT answered positively to the question: *Do you think that the participation of your organisation in the European FOTs has met the original expectations?* More details can be found on the presentation slides.

Three seminars are planned for 2013:

- A special FOT-Net seminar for cooperative systems pilots, Barcelona, 4-5 April, 2013
- FOT-Net Seminar on Tools for gathering and analysing data, especially in FOTs of cooperative systems, Berlin, 25 April 2013
- Seminar in September 2013, for which input was asked from the stakeholders on the topic.

### **Panel - Tour de table & short introduction**

The following projects presented themselves:

- Co-Cities: by Alexander Frötscher, AustriaTech
- Compass4D: by Siebe Turksma, Peek Traffic
- eCoMove: by Philipp Gilka, DLR
- DRIVE C2X: by Tapani Mäkinen, VTT
- smartCEM: by Luca Pascotto, FIA
- MOBINET: by Paul Kompfner, ERTICO – ITS Europe

### **Co-cities: Cooperative Cities extend and validate mobility services**

The Co-cities project works on providing real-time travel information services.

### **Compass4D: Cooperative Mobility Pilot on Safety and Sustainability Services for Deployment**

Compass4D pilots three applications: Forward Collision Warning (FCW), Red Light Violation Warning (RLVW), and Energy Efficient Intersection Service (EEIS).

Their objectives are to:

- demonstrate the positive cost-benefit of Cooperative Systems
- make sure the services remain alive after the end of the project
- become a reference model for other cities
- raise public awareness and user acceptance
- support international cooperation and standardisation

### **eCoMove: Cooperative Mobility Systems and Services for Energy Efficiency**

The objective of eCoMove is to develop a combination of cooperative systems and tools using V2V and V2I communication to help:

- drivers sustainably eliminate unnecessary fuel consumption;
- fleet managers manage their vehicles more economically and promote eco-driving through feedback & incentives;
- road operators balance traffic flows in the most energy efficient way.

### **DRIVE C2X**

The objectives of DRIVEC2X are to:

- carry out a comprehensive assessment of cooperative systems through extensive European FOT
- to create and harmonise a European-wide testing environment for cooperative systems
- coordinate the tests carried out in parallel throughout the DRIVEC2X community
- Evaluate cooperative systems
- Promote cooperative driving

Functions to be tested are related to: traffic flow, traffic management, local danger alert, driving assistance, internet access and local information services, and test-site specific functions.

### **smartCEM: Smart Connected Electro Mobility**

The objectives of smartCEM are to:

- prove that user acceptance of electrical vehicles can be increased by at least 15%
- evaluate how much transport efficiency can be optimised
- develop tools
- identify barriers and address all deployment elements
- support pan-European interoperability
- pave the way for wider acceptance of adopting electro mobility in all types of road transport
- integration of new schemes
- inform about the smartCEM services

smartCEM implements 5 services: navigation, efficient driving, trip management, charging station management, and sharing management.

### **MOBINET**

Mobinet is not a pilot project but aims to create a single Europe-wide service platform to provide:

- a federated directory of all European online services for transport and mobility;
- an identity authentication and management scheme to allow single sign-on for any user for multiple services;
- a unified accounting and mobile payment framework, and mechanism for clearing between providers;
- a secure operating environment for in-vehicle and portable devices, offering users access to a dedicated app-store, and service providers access to all users with any type of compliant device;
- a B2B marketplace for automatic negotiation of service agreements when adding extra service components and data sources to existing service offerings.

[For more detail we refer to the project available at the FOT-NET website](#)

### **2.4.3 Session 1 – Interoperability of deployed cooperative systems in the pilots**

The questions addressed were:

- Is interoperability needed within and between pilots? What do pilots gain from interoperability?
- How can we test interoperability? Should interoperability tests be organised across pilots?
- How do you manage interoperability issues in your pilot, and what are they?

Hossein Zakizadeh (Volvo) moderated this session. He started with emphasising the difference between data, information, knowledge and wisdom. Our goal is to reach “wisdom” together, not just to exchange data.

Different views were stated on interoperability and the importance it has in different projects and stages of development. In the discussion the following elements were addressed.

#### *The nature of cooperative systems*

Cooperative systems may mean different things. Some user-applications run on a smart phone, others are connected to the vehicle.

#### *The need for interoperability*

In large projects such as DRIVE C2X, large effort is already made on interoperability, however between pilots this would require more resources. Systems have to be interoperable if they are to be used at different sites, for example in different cities – as in some pilot projects.

It depends on the objective of the project whether focussing on interoperability is worth the effort. If the project is research oriented, interoperability is only “nice-to-have”, if deployment is the goal, interoperability is essential.

#### *The role of standards*

The way to solve interoperability issues is to develop and apply standards, not necessarily by bringing projects together to solve the issue.

It would be nice to have some kind of certification of interoperability e.g. as in electromagnetic certification.

It should be required that all pilots use the C-ITS standards (ETSI-CEN)

#### *Interoperability on different levels:*

At data-level it is not such a problem, but the goal of cooperative systems is to exchange information, whatever technology is used. At functional level interoperability is a challenge; functions that look the same may in practice do different things.

#### *Comparability of project results:*

Comparability of project results is more important than interoperability, in order to extract knowledge that is applicable to other situations.

It is more difficult to compare data from different pilot sites but as a prerequisite a provider should ensure interoperability between test sites, so interoperability and comparability are tightly linked.

One of the problems with regard to comparability of data is that sometimes we are too focussed on getting positive outputs, not being rigid enough in applying methods and taking a scientific approach, which makes it hard to perform a meta-analysis afterwards in order to compare what actually works and what not. An example could be measuring the amount of fuel saved in different pilots using different systems.

We have to be aware that laboratory studies are very different from field studies in transport. In transport, you cannot produce the same situations as you can in labs. Conditions cannot be reproduced from one country or city to another – you will have

similar cases but they won't be the same. A comparison was made with medical studies where there are carefully described procedures and methodologies, although there are also a lot of variables that cannot be controlled - just as in traffic.

The question was raised whether there is a need to try to have a uniform kind of applications to make data comparable. This question was answered negatively: the pilot projects are piloting applications, we first need results, we can compare later. If we don't have results, we don't know whether the applications work.

As we want to acquire knowledge about cooperative systems, it is important that the applications used in pilots are different, and that the pilots are well designed, executed and analysed. Knowledge should be comparable, not just data: from each FOT we want to learn something new and this knowledge needs to be shared. In other words: accumulating knowledge, transferring experience, and sharing knowledge; this is the aim of FOT-Net. At EU level best practice lies in diversity of experimentation.

#### *Sharing data and results:*

Performing meta-analyses, comparing results and sharing data require coordination, for example by support actions or a special project. Timing is an issue, as many projects run in parallel. Data-ownership is another obstacle. The EC could have a role to play in this: individual projects are like small companies, and they will only share what is in their own project's interest. Projects are also not funded for 100%. The outcomes of pass-or-fail tests of products are also very secret information in the industry.

Guidelines are needed for data-sharing and comparing results, especially for new projects. There are some guidelines, for example from FOT-Net, but they are not always applied.

#### *Developing business cases:*

One of the main goals of pilots is to show how well applications work so people are willing to invest in them. This means that you have to spend a lot of effort in proving that it is working. However, in order to prove that some results are statistically robust you need to collect enough data. This type of statistical analyses of the results is often missing due to lack of time and resources. The main questions are: Does the system work? And moreover, does it work always, everywhere, for everyone? In the pilot phase, you need some proof, but to trigger deployment, you need much more.

One way out of these dilemmas is to perform meta-analyses of results from multiple projects.

How can I learn something from the application? How many vehicles should I count to have benefits? This has an impact on the interoperability of systems. Car makers won't go for interoperability of functions, because they want to differentiate. With a different set of data can I count on other brands to have data that is useful for me? Interoperability is good between platforms, not necessarily between functions. Therefore interoperability is good at a certain level, but differentiation is more important at other levels. For functions we are still experimenting and we will need differentiation. We could define a limited set of applications at function level that will allow us to evaluate rather than benchmark. For

this we need a clear, detailed description of functions, and to use a common terminology. We may also need to look at interoperability from the end-user perspective.

Pilots prepare for deployment and this is about user acceptance and adoption. There are methodologies for evaluating these aspects (e.g. TeleFOT developed one), and some projects (like DRIVEC2X and FREILOT) are evaluating user acceptance.

### *Testing interoperability*

The questions about testing interoperability are answered differently depending on the project objectives. For projects with multiple sites, cross trials need to be organised in order to ensure that applications work in different contexts. Interoperability can also be ensured by design, if a common architecture is used for all applications to be tested in a FOT. When standards are used, applications should be, as a speaker called it, “fundamentally interoperable”.

Plug-tests are another way of finding out about interoperability. Several projects have organised such events, where people can test whether their applications are interoperable.

In conclusion it is important to address interoperability in every pilot, because they are about cooperative systems and communication between systems all over Europe, and even globally, is needed.

## **2.4.4 Session 2 – Data sharing**

The questions addressed were:

- What can we gain from exchanging data?
- Which data should be shared between pilots?
- Are the pilots willing to share data?
- How can we put data sharing into practice?

Helena Gellerman (SAFER) moderated this session. She emphasised that cooperative systems push for solutions on data sharing issues. Vehicle manufacturers sell products globally; so standards are needed. For cooperative systems we have to focus on the kind of messages that are exchanged and how they are interpreted.

The following issues turned up in the discussion:

### *Data*

When we speak about data we may mean different things. Data may be the result of a study, but they may also mean technical data. Data coming from studies are useful for other types of studies, such as (micro-)simulation studies, to validate and calibrate simulation models.

### *Legal aspects*

A lot of effort is required to comply with legal documents, and to get people to sign consent forms. Whether you can exchange data with others depends on the kind of data, what participants have consented to, legal requirements and what is written in the

consortium agreement. It is important that new projects benefit from previous projects and that they bring this knowledge into the design of their consent forms, consortium agreement, etc. - e.g. UDRIVE has addressed data sharing in their consortium agreement to be able in the future to share the data.

When we talk about cooperative systems, data are broadcasted by the vehicle to the outside world: there are legal issues stemming from the use of these data for one's own purpose, and data should be protected. You are not necessarily allowed just to use the data that are out there. Data sharing is part of the business, but data should be cleaned from elements that make personal identification possible.

### *Gains from sharing data*

Pilots are take place in different parts of Europe, and projects are often exchanging data between pilot sites. One idea is to have some kind of project that actually brings together the key players from the different projects that is funded, to look at the data exchange and at the knowledge gained from the different pilots.

If a repository of data, figures, facts, etc. was available and well-maintained, stakeholders would use it.

Some speakers object to the idea of exchanging data. In the projects they are more interested in the data itself than in the process of exchanging the data. One of the reasons for reluctance to share data is that people know how poor their data is. The data is OK for the analysis done in the project, but the quality needs to be improved, if it should be used for a more general purpose. In most projects, there is no additional money left to take this extra step.

If you know that other people are likely to see your data, you will improve the quality of your data, even if you don't end up sharing at all.

### *Storing data and making them accessible to others:*

It is not always easy to know what data are worthwhile to keep for posterity. For example in the UK you have to specify the purposes for which you are storing data. It is often not necessary to store confidential data.

It might be useful to have a project that decides which data is useful to keep and to share, but it may not be possible for just one group to determine what is useful for posterity.

In projects there is usually not enough time to clean the data in order to be able to reuse it. For example in FREILOT they tried to log everything and make it available. However, if you don't know exactly what the data represent it may be useless. There may be so many exceptions in your data that you should have a good understanding of what the exceptions are, for example wrong GPS data due to reflection.

It would be nice to have a matrix that describes the activities of each FOT and that one could look at to see what each project is doing, where there are similarities, what one can look at, and what one can share. In the FOT-Net data sharing seminar one of the findings from the discussion was that, in their design, FOTs can be so different that you

have to be careful when comparing data. The FOT-Net wiki doesn't compare but lists project features.

We have to be aware of bad comparisons. To know the way in which data were collected is also extremely important, else you cannot really compare.

In the development of the FESTA methodology, it was proposed to have a minimum common set of data that is collected in order to be able to do meta-analyses, and to agree on which kind of data should be exchanged. However, this idea was rejected, as the whole FOT/NDS area was quite new in Europe and the focus was on learning how to collect and analyse the data. Knowledge and trust was not mature enough.

It was concluded that data sharing is possible. Often partners are the same in different projects: this also helps in sharing data. If we could form a project (with people who have experience in FOTs and pilots) that could try to define a common technical platform, this would represent a step forward to deciding what data have to/could be shared. It would also be good to have a meta-analysis project. The costs of having the experts brought together and performing this meta-analysis are nothing compared to running an FOT.

For data sharing you have to define what kind of data is useful for posterity and define standardised ways to share data. New projects should be required to share their data.

The FOT-Net International Workshop at the ITS World Congress 2013 in Tokyo will address data sharing. Japan and the US are interested in data sharing from a cooperative systems' point of view.

### **2.4.5 Session 3 – Deployment & business plans**

The questions addressed were:

- What will be achieved in terms of deployment at the end of the pilot?
- Should pilots join forces for promoting each other's successful deployment?
- What can be reused from your deployment experience?
- What added-value could a community of pilots bring?

Tom Alkim (RWS) moderated this session. Some issues raised in the discussion were as follows.

#### *Need for roadmap and strategy;*

We miss a roadmap to deployment from the results of projects. Deployment is just left to the market or the partners. There should be a mechanism to help this take off.

For deployment you need commitment and resources: partnerships are needed to agree on a common investment plan.

Deployment is a competitive process: the better service gets the most customers, and eventually the service will be deployed all over Europe.

Deployment might start with entertainment services.

#### *Sharing deployment activities:*

It is good to learn about the others' successes and pitfalls, and stakeholders are interested in hearing the stories, but it will only work if the involved parties are willing to share these stories. Consortium agreements and other contractual obstacles may prevent this from taking place.

When pilots have results there is an interest in broadcasting them as widely as possible and it could be interesting for other projects to share that broadcasting and interest, and to convince potential buyers. We should think more about how projects may work together in their exploitation phase. Showing that something works makes the beginning of deployment easier.

For the different ways in which the projects work on deployment, [the presentation slides available at the FOT-Net website](#) provide more information.

In conclusion it is clear that deployment is not going to happen by itself, stakeholders need to be brought together and a critical mass of clients such as cities, authorities or operators are needed.

#### **2.4.6 Closing remarks and next steps**

Wolfgang Hoefs (European Commission DG CONNECT) concluded that we need to bridge the gap between FOT, pilots, and the phase of deployment. FOT-Net has an important role to play and has the full support of the EC within this framework. It is an important tool to prepare for the deployment measures that need to be taken.

Interoperability is an important issue and we have achieved a lot in the past. FOT-Net is a good platform to discuss these issues. There is not only a European dimension to the issue, but also national and international ones. The EC is currently looking into further steps on data sharing, also in cooperation with the US and Japan - especially on probe data. A small European study will be started by FOT-Net on this issue, in collaboration with the iMobility Forum.

Wolfgang Hoefs concluded by emphasising the open data access policy of the EC. It is expected that this will have an impact on future projects on how contracts are concluded. Open access will be implemented in the future. It was noted that it is already difficult to share data within the EU so it might be difficult to share with the US. However, USDOT has a clause in project contracts that data have to be made available for research.

Maxime Flament (ERTICO – ITS Europe) wrapped up the workshop by concluding that FOT-Net is committed to data sharing, all the more since it has a working groups looking into how data sharing may be facilitated. In the FOT-Net International Workshop which will take place in Tokyo on 13-14 October, data sharing will be at the centre of the attention.

In his concluding slides a summary of the discussions of the day may be found.

[All presentations are available a the FOT-NET website](#)

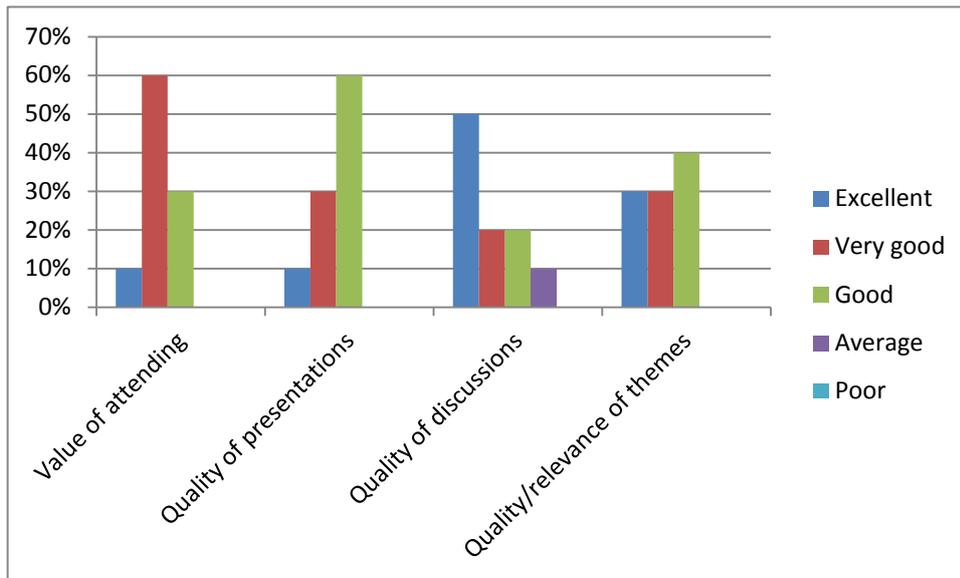
#### **2.4.7 List of participants**

##### **Table 5 List of participants 8<sup>th</sup> stakeholders workshop**

Organisation	LastName	FirstName
ADAS_Management Consulting	Hagleitner	Walter
ASFA	Toulminet	Gwenaëlle
AustriaTech	Frötscher	Alexander
CEN	Legrand	Thierry
Chalmers University of Technology	Franzen	Stig
CTAG	Blanco	Rosa
DEKRA e.V.	Deiters	Oliver
DLR	Gilka	Philipp
EC	Vits	Andre
EC - DG MOVE (ITS)	Kenis	Eric
ERTICO - ITS Europe	Fernandez	Laetitia
ERTICO - ITS Europe	Kompfner	Paul
ERTICO - ITS Europe	Mure	Sébastien
ERTICO – ITS Europe	Barnard	Yvonne
ERTICO-ITS Europe	Flament	Maxime
European Commission DG CONNECT	Hoefs	Wolfgang
European Union Road Federation	Diamandouros	Konstandinos
FEMA asbl	Delhayé	Aline
FIA	Pascotto	Luca
Fraunhofer Fokus	Sawade	Oliver
Imtech Traffic & Infra	Turksma	Siebe
ITS Sweden	Boethius	Eva
MIRA Ltd	Cross	Gabrielle
Nimera Mobile ICT	Vermassen	Erwin
OHL Concesiones	Cacheiro	Emilio
Polis	Hoadley	Suzanne
Polis	Stoycheva	Daniela
Q-Free	Søråsen	Runar
Rijkswaterstaat	Alkim	Tom
SAFER	Gellerman	Helena
SpaceTec Partners	Flamma	Tommaso
TNO	Jonkers	Eline
TomTom	T'Siobbel	Stephen
University of Leeds	Thomasson	Erik
VIM	Lowyck	Bart
Volvo Group Trucks Technology	Zakizadeh	Hossein
VTT	Mäkinen	Tapani

Number of participants	37
Number of women – men	11 - 26
Associations/user groups/European Commission	14
Industry	8
Universities/research organisations	9
Road operators/public authorities	4
Other/unknown	2

### 2.4.8 Feedback



**Figure 2 Feedback 8<sup>th</sup> stakeholders workshop**

In total, 10 feedback forms were returned.

## 2.5 9th Stakeholders Workshop Speed Alert: from research to deployment

[http://www.fot-net.eu/en/networking/stakeholders\\_meetings/fot-net\\_9th\\_stakeholders\\_meeting.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/fot-net_9th_stakeholders_meeting.htm)

### 2.5.1 Agenda

9:00 – 9:30	Welcome coffee and registrations	
9:30	Introduction and Meeting objectives	Maxime Flament, ERTICO – ITS Europe
9:45	FOT-Net activities and working Groups: an update	Yvonne Barnard, ERTICO – ITS Europe
10:00	Speed alert, functions, variations and use and overview of FOTs on speed alert	Oliver Carsten, University of Leeds
10:45 – 11:00	Coffee Break	
11:00	Speed Alert, European Policy	Pawel Stelmaszczyk, European Commission, DG Mobility and Transport
11:20	SpeedAlert in EuroNCAP	Richard Schram, EuroNCAP
11:40	Suppliers: Products on the market and future	Karsten Becker, Continental Automotive GmbH
12:00	Nomadic devices: Current products and future	Frans van Dingenen, Nokia
12:30-13:30	Lunch	
13:30	Deployment of speed alert: the perspective of the public authorities	Anna Johansson Jacques, Swedish Transport Administration Jacques Erlich, IFSTTAR
14:00	Status of Speed limit maps in Europe	Nick Cohn, TomTom
14:20	European initiatives and perspective: including digital maps	Maxime Flament, ERTICO – ITS Europe

14:40	Panel discussion on impact of Speed Alert deployment in the next 10 years	Yvonne Barnard, ERTICO – ITS Europe
15:20	Closing remarks and next steps	Yvonne Barnard, ERTICO – ITS Europe
15:30	Workshop close	

## 2.5.2 Introduction

This workshop was organised in collaboration between the FOT-Net, ADASIS and TN-ITS.

The focus of the workshop was on Speed Alert Systems, also called Intelligent Speed Assistant (ISA).

Over more than 10 years, many FOTs have been investigated the benefits of these systems. Now the industry is entering the full-scale deployment phase. Indeed, the systems are now fully integrated in the EuroNCAP assessment program, which means that it will get harder for vehicle manufacturers to receive five stars if the vehicle is not equipped with a Speed Alert system.

Today, speed limit information stored in the navigation map databases is not used by any other systems in the vehicle. ADASIS has defined an information exchange interface to allow Advanced Driver Assistance Systems (ADAS) to use map data such as legal speed limit, vehicle position and speed. The **ADASIS** Forum celebrated its tenth year anniversary in 2012 corresponding also to the launch of the first products based on ADASIS specifications from Scania (Active Prediction™) and Daimler (Predictive Power Train Control). These new systems for trucks achieve about 3-5% reduction in fuel consumption. Speed profiles are key data provided by the ADASIS interface to the ADAS application enabling speed related applications.

During the workshop, we looked at the ways in which these systems were tested, the outcomes of a variety of FOTs, the ways in which stakeholders deploy the outcomes and the impact large-scale deployment will have on safety, mobility and the environment in Europe. Also, the current actions to improve digital map content were presented.

**NOTE: as speakers used both Speed Alert Systems (SAS) and ISA (Intelligent Speed Adaptation or Assistance), these terms will also be used interchangeably within this report.**

[All presentations are available a the FOT-NET website](#)

## 2.5.3 Meeting objectives

Maxime Flament (ERTICO – ITS Europe) explained the agenda of the workshop and introduced the three projects responsible for the workshop.

**FOT-Net:** FOT-Net is a support action funded by the European Commission to network Field Operational Tests (FOTs) activities at national, European, and international level, and to promote the FESTA methodology. FOT-Net is the point of reference for anyone interested in FOTs, their set up and their results. FOT-Net is open to all stakeholders from public and private sectors willing to exchange experience and benefit from each others' learning processes. The objective of FOT-Net stakeholders meetings is to provide a forum for cooperation, discussion and information exchange.

**ADASIS:** The **ADASIS** (Advanced Driver Assistance Systems Interface Specification) Forum was launched by ERTICO in order to address the interface specifications necessary for the information exchange of Advanced Driver Assistance Systems (ADAS).

**TN-ITS:** The Transport Network ITS Spatial Data (**TN-ITS**) Deployment Platform is a new forum to facilitate the provision and exchange of ITS spatial data between public authorities and third parties throughout Europe. TN-ITS is directly linked to the Action 1.3 of the ITS Action Plan on "Accurate Public Data for Digital Maps". In particular, it is expected to contribute to the seamless distribution of up-to-date legal speed limit updates. The first TN-ITS General Assembly will take place on the 5 June 2013.

#### **2.5.4 FOT-Net Working Groups, stakeholder needs and seminars**

Yvonne Barnard (ERTICO – ITS Europe) described the work that is ongoing in the FOT-Net project, especially the work on the Wiki (in which 13 FOTs on ISA can be found, see <http://wiki.fot-net.eu>) and the analysis of stakeholders' needs.

Upcoming FOT-Net events are:

- Seminar on Best Practices, 23 September, Versailles, 23 September 2013
- FOT-Net 6th International workshop at ITS World Congress. Tokyo, 14 October 2013
- 10th Stakeholders workshop, focussed on naturalistic driving, Brussels, 26 November 2013

A new support action is under negotiation: FOT-Net Data under the coordination of VTT. The goals are:

- Target efficient **sharing and re-use of global data** sets in up-coming analysis projects;
- Continue European and international **networking** activities in the domain of Field Operational Tests (FOT). And maintain and increase the momentum achieved in FOT-Net;
- FOT-Net Data explicitly addresses the need to catalogue and **exploit the collected data**.

#### **2.5.5 Speed alert, functions, variations and use and overview of FOTs on speed alert**

Oliver Carsten (University of Leeds) gave an introduction on speed alert, or preferably called ISA: Intelligent Speed Adaptation. Three kinds of ISA can be distinguished: ISA has 3 variants of increasing power:

1. Advisory (show the speed limit and warn when over-speeding is detected). Also known as "Speed Alert"
2. Intervening (driver can override but speed limit is otherwise encouraged or enforced)
3. Mandatory (no override possible)

This last scenario offers largest benefits especially in terms of safety. The presentation concluded that although benefits are extremely positive and public attitudes are generally favourable, the political will has been mostly lacking. However, euroNCAP has now adopted ISA in their safety 'star' system, and they work on an evidence-base for this. Including ISA in the euroNCAP star rating would be expected to raise the adoption rate for ISA as manufacturers seek to gain or retain the highest safety rating for their vehicles.

Oliver presented the main FOTs on ISA, and described in more detail the ISA UK FOT. In this FOT, a voluntary intervening system was trialled where the system would 'deaden' the throttle when the speed limit was reached, but where the driver could choose to override and 'kick through' this speed restriction. 80 drivers participated in the study - both 'speed intenders' and 'speed limit compliers'. The findings demonstrated that in the UK trials ISA showed a particular effect on reducing high-speed driving. OC observed that the effect of ISA would be likely to be more pronounced in countries where drivers are less compliant with speed restrictions than in the UK. A notable statistic presented is that the predicted safety impact of ISA would be greater than the safety benefits realised by making compulsory the wearing of seat belts by front-seat car occupants.

Two potential 'futures' were presented:

1. Where ISA is only adopted by those manufacturers who want to
2. Where there is an authority driven regulatory path to introduce it

The business case (based on reduced accidents but also fuel and CO2 savings) appears to be very strong with a benefit to cost ratio of 7.4:1 predicted for the mandatory introduction of ISA. OC suggested however, that the political will to implement IAS had to date, been lacking.

In the discussions it was noted that most ISA FOTs are located in Northern Europe. In the cost benefits analysis one should also take into account the costs that are saved by not having to build traffic calming infrastructure.

When promoting ISA, insurance can play a role, especially of young drivers. The fleet market is also important, they are very safety conscious. ISA may also become more popular if people are afraid of losing points on their driving license.

The case of Ireland was put forward, where there are mostly rural roads. Road operators are now reconsidering more differentiation in speed limits; ISA might be helpful to keep drivers aware of these differences.

A remark was made about the Danish situation, where young drivers do think ISA is a good idea, but do not like to have it in their own cars – even when offered a 30% discount on their insurance costs!

There was a question about whether ISA might be dangerous because other drivers might driver faster, the ISA car becoming a source of frustration. There is some evidence that this is

no longer the case: if a large group of drivers have ISA, speed in traffic will become more homogeneous, and thus safety will increase.

### **2.5.6 Speed Alert, European Policy**

Pawel Stelmaszczyk from the European Commission, DG Mobility and Transport, explained that ISA is one of the possible candidates for the new ITS directives in the future. At the moment the priorities are:

- EU-wide Multi-Modal Travel Information
- EU-wide Real-Time Traffic Information
- Free Safety-Related Minimum Traffic Information
- Interoperable EU-wide eCall
- Information Services for Truck Parking
- Reservation Services for Truck Parking

Next year specifications will be drafted for additional priorities, one of which may be ISA. ISA has great potential, as assessed by several studies. For example, at the moment it is under study whether ISA could be made mandatory for heavy vehicles where new systems for truck (eg. Scania and Daimler Benz) suggest a 3-5% reduction in fuel consumption is possible.

For deployment of ISA digital maps need to be improved, the major challenge is to get accurate up-to-date-data for digital map makers in order to deliver improved road safety. A particular problem is that Local Authorities need to provide accurate speed limit data but the problem here is resources. Also standardised interface connections are needed and ADASIS is therefore developing an interface to gather the data currently stored within the vehicle. One problem is that driver awareness of ISA is low. Pawel suggested that agreeing one clear name for the speed alert system would help in its promotion and reduce confusion for consumers.

Pawel mentioned that is he interested to get feedback on issues such as non-legislative measures to promote the use of ISA, such as insurance incentives, and the possibilities for retro-fitting in older car-models. It was discussed whether there could be a non-binding guideline on ISA from DG Move, this could be an alternative to a delegated act. Concerning the time line: 2015-2016 for new specifications, so ISA could be a directive in 2017.

### **2.5.7 SpeedAlert in EuroNCAP**

Richard Schram (EuroNCAP) gave an overview of EuroNCAP – an independent Brussels-based organisation formed in 1997. He explained how EuroNCAP has developed research methods and protocols to test a range of vehicle safety measures in its laboratories. Richard described different types of speed limiter and how these are assessed in their protocols. The tests are technology-neutral and assess systems based on maps, cameras or a combination of the two. Importantly, for the systems as to be acceptable, the system must be integral to the vehicle - not a peripheral add-on device. OEMs also need to provide information on the data and the maps they are using. There is now a first set of test and assessment protocols for assessing Speed Assist Systems (SAS) which provide information, warnings and limitations. At present, vehicles do not currently need to have a SAS to receive a 5\* rating but this is likely to change with the implication that implementation rate of SAS is expected to

further increase. Protocols will be updated as systems improve. In the assessment system more points are given for intelligent speed warning and speed limitations functions.

### **2.5.8 Suppliers: Products on the market and future**

Karsten Becker (Continental) described eHorizon@continental solutions in the past and in the future. The market drivers he identified for speed systems are: environment, safety, information and cost-efficiency. For the future, vehicles such as trucks will have speed systems without any problem, but for personal cars drivers may be reluctant. For trucks it is easier to calculate the pay-off time for the product in terms of fuel-cost savings for trucks than it is for cars. The role of the OEMs is also a question, for example how are they credited for CO2 reduction? The challenge is to somehow combine all the benefits of the product in order to best justify the cost for arrange of different purposes. Karsten also repeated the call for greater investment in map data.

### **2.5.9 Nomadic devices: Current products and future**

Frans van Dingenen (Nokia NAVTEQ, now re-branded: "here") presented nomadic devices for speed alert. He stated that the principal drivers were, for consumers: lower insurance premiums and avoiding driving penalties; and for Government: vehicle accident reduction and EuroNCAP. He also discussed requirements for adoption by users: systems should be personal, unobtrusive, and timely and accurate. Confidence in the system is important and should be built through connectivity, so that not only the legal speed limit is known, but also the desired speed, for example for a difficult curve, and that drivers are advised well in advance. Drivers like to be reassured in this way, but the HMI is crucial.

His conclusion was that Speed Limit Warning Systems in nomadic devices have the potential to influence driver behaviour, promote a positive driver experience, and encourage safer driving. Next generation maps used in conjunction with hybrid and connected cars can support these behaviours by effectively managing timely delivery of information and providing intelligence consumers can trust.

In the discussion it was emphasised that the context of the road where the driver is driving is important, not only the map, in order to be able to provide accurate advice on the driving behaviour. The use of smart probe data will be necessary to establish actual behavioural operational speeds (as opposed to arbitrary speed limits assigned to stretches of roads by planners).

### **2.5.10 Deployment of speed alert: the perspective of the public authorities**

Anna Johansson Jacques (Swedish Transport Administration) presented the Swedish ISA Trial which took place between 1999 and 2002 involving 5,000 vehicles and 10,000 drivers in 4 test areas. Participants were in great majority positive about ISA (70-80%). The Swedish strategy is that ISA should be offered as a voluntary, supportive system and it will be introduced with a market approach. The role of public authorities is to provide speed limit data to the market, to keep it up-to-date, and to publish information about the available data. Data will not be pushed to drivers; services need to pull the data. The trial showed that the correct speed data is essential to user-acceptance). Anna also described how the

'ROSATTE' web service has been set up to provide geo-referenced speed information to import into various systems. This project aims to establish an efficient and quality ensured data supply chain from public authorities to commercial map providers with regards to safety related road content.

Jacques Ehrlich (IFSTTAR) described the deployment of speed alert in France, and especially the LAVIA project. A deployment roadmap was developed with a 2 step approach. Step 1 concerns an active speed limiter with driver validation and step 2 a full automated speed limiter. However, due to the change in government in 2012, the LAVIA working group was put on standby and no decisions were taken. Currently the newly created workgroup "Technological Tools and Road Infrastructure" is again considering ISA systems.

The way to go forward for ISA is to reach a European consensus on active speed limiters and a realistic evaluation of ISA costs. EuroNcap could play a major role in supporting and promoting active ISA systems.

FAQs include what is the cost? and what is the driver prepared to pay? – Jacques suggested that the driver should be prepared to pay at least the cost of the first fine avoided through having the system in place.

Discussions picked up the difficulty that car manufacturers have concerns about their potential liability should accidents or fatalities result from ISA systems being implemented in their vehicles.

### **2.5.11 Status of Speed limit maps in Europe**

Nick Cohn (TomTom) presented several TomTom technology highlights and addressed the questions of how collect speed data and update the map? how can we detect and validate change?

TomTom aim for the map data to be 95% correct and 100% complete (no segments with missing speed data) with positional accuracy to 10m. The primary source of the data are their mobile mapping vans plus passive and active community feedback. Ideally however, the Local Authority should be the primary source. Nick gave a brief overview of how their 'MapShare' system merges, validates and confirms various data sources and described its use with the ROSATTE project in Sweden.

### **2.5.12 European initiatives and perspective: including digital maps**

Maxime Flament gave an overview of European initiatives related to electronic speed maps. He discussed the ROSATTE project which developed a generic framework to facilitate access, exchange and maintenance of spatial data and asked, how can we assist / encourage others to follow their lead?. The INSPIRE directive was described: general rules to establish an infrastructure for spatial information in Europe. He concluded that ITS Spatial Data is a must in our digital society for improving road safety and sustainability in the future. He emphasised the necessary role of public authorities and that they should embrace the principle of notification of new changes.

### **2.5.13 Panel discussion on impact of Speed Alert deployment in the next 10 years**

Yvonne Barnard posed the following question: ***“If in 10 years all cars have an ISA system, what would have been the most important enabler?”***

#### **Responses from both panellists and participants:**

- Insurance to stimulate the use of ISA
- Car makers following EuroNCAP, although that won't affect older cars – they last over 10 years.
- Responsibility and liability, which is a major concern of car manufacturers
- Consumers and drivers are not ready for Speed Alert yet – more work needs to be done.
- Cost-benefit balance.
  - For the consumer: they must know benefits before they pay for it. You need to be able to break these costs down to the end-customer level. Implementation costs nearly nothing, as much of the technology is already in place. However, it was also remarked that Insurance repair costs have increased and will increase further due to more and more on-board technology.
  - For society: The congestion effect of an accident is not currently counted in the UK cost benefit assessment manual, Smooth traffic flow is therefore desirable. We have real numbers to show how much of the network can be measured. Governments / EU have to lead too. The cost of accidents is not just borne by insurance companies but there is a social cost.
- Policy, especially when we see the potential increase of safety resulting from these ISA studies. Policy-makers cannot ignore these numbers – and they should lead to ITS directives
- The whole chain needs to be taken into account – OEMs will implement if convinced the data will be accurate.
- The impact of ISA is huge – congestion, road efficiency and fuel consumption, not just safety.
- The rural network is a big question mark. The rural single carriageway system will not benefit from an ISA. It needs much more intelligent mapping and driver alerts e.g. 'Dangerous road ahead'.
- The network benefits only from a high penetration so there is little incentive for early adopters to pay.

### **2.5.14 Closing remarks and next steps**

Yvonne Barnard made closing remarks summarising some of the main conclusions drawn during the day:

- There is a clear agreement on the benefits of ISA/speed alert
- A lot of research has been done, there is ample evidence of the benefits.
- ISA is now ready for deployment, business cases can be developed.
- However, there are still technical issues, such as with HMI and accuracy.
- The future will be for speed alert integrated in other systems, also providing other information.
- Promotion and raising awareness, both with the general public and politicians is needed.

- User acceptance is still an issue, especially with the more active forms of ISA, for consumers, OEMs and public authorities.
- There is still no consensus about the best name for speed alert or ISA.

[All presentations are available at the FOT-NET website](#)

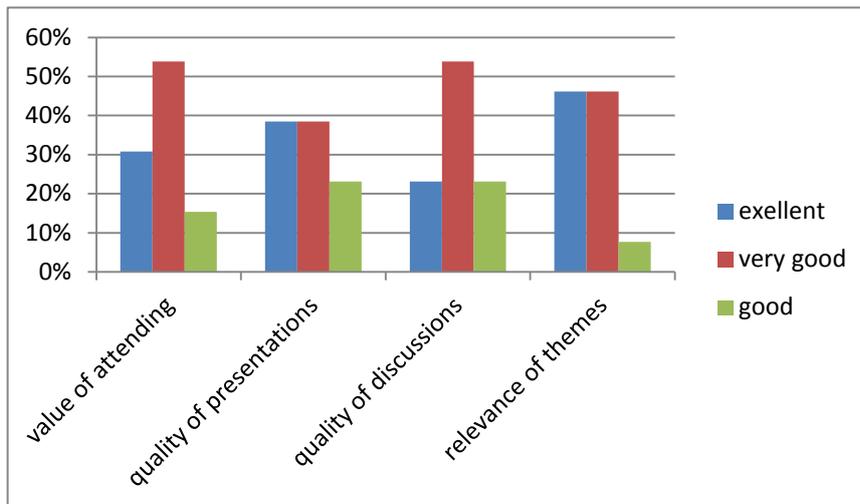
### 2.5.15 List of participants

**Table 6 List of participants 9<sup>th</sup> stakeholders workshop**

Organisation	Last Name	First Name
Aalborg University	Agerholm	Niels
ASFA	Seddi	Malika
AVL	Jones	Stephen
Continental-corporation	Dr. Becker	Karsten
Dinalog	Lu	Meng
EC	Stelmaszczyk	Pawel
EC	Hoefs	Wolfgang
ERTICO	Barnard	Yvonne
ERTICO	Flament	Maxime
ERTICO	Wevers	Kees
Euro NCAP	Schram	Richard
France Government	Pagny	Roger
Gent University	De Mol	Johan
Geoloc	Perpey	André
IFSTTAR	Ehrlich	Jacques
IFSTTAR	Blosseville	Jean Marc
ITS Norway	Hovland	Trond
Leeds University	Carsten	Oliver
Leeds University	Thomasson	Erik
National Road Authority	Cullen	Harry
NDW	Vlemmings	Tiffany
Nokia	Dreher	Stephane
Nokia	Nasr	Ahmed
Nokia	Van Dingenen	Frans
npra	Olsen	Erik
Stratos GPS LLC	Simons	Louis
TomTom	Cohn	Nick
TomTom	Despoina Tzanidaki	Johanna
Trafikverket	Johansson Jacques	Anna
Trafikverket	Hallström	Bengt
Triona, Sweden	Svensk	Peo

Number of participants	31
Number of women – men	6 - 25
Associations/user groups/European Commission	7
Industry	11
Universities/research organisations	6
Road operators/public authorities	4
Other/unknown	3

### 2.5.16 Feedback



**Figure 3 Feedback 9<sup>th</sup> stakeholders workshop**

In total, 13 feedback forms were returned.

## 2.6 10th Stakeholders workshop Naturalistic Driving

[http://www.fot-net.eu/en/networking/stakeholders\\_meetings/10th\\_fot-net\\_stakeholder\\_workshop\\_on\\_naturalistic\\_driving\\_studies.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/10th_fot-net_stakeholder_workshop_on_naturalistic_driving_studies.htm)

### 2.6.1 Agenda

9:30 – 10:00	Welcome coffee and registrations	
10:00	Introduction, meeting objectives, and an update on FOT-Net activities	Yvonne Barnard ERTICO – ITS Europe
10:20-11:20	Session 1: NDS in Europe and US  What are the objectives and main research questions? What benefits can be expected from the outcomes of the studies? How will the data collected be used in and outside the projects? What is the current status of the project?	
10:20	UDRIVE: the European Naturalistic Driving Study	Rob Eenink, Project coordinator UDRIVE, SWOV
10:40	SHRP2: the US Naturalistic Driving Study	Kenneth Campbell SHRP2, Chief Program Officer Safety, Transport Research Board
11:20–11:40	Coffee Break	
11:40-12:40	Session 2: NDS with two different types of vehicles  <ul style="list-style-type: none"> <li>What are the objectives and main research questions?</li> <li>What benefits can be expected from the outcomes of the studies?</li> </ul>	
11:40	Naturalistic cycling studies	Marco Dozza, Chalmers/SAFER
11:55	Naturalistic motorcycle studies	Martin Winkelbauer, KFV
12:10	Panel discussion  <ul style="list-style-type: none"> <li>What are the specific issues for naturalistic driving of different types of vehicles?</li> <li>How can these studies complement each other in order to gain more knowledge on traffic safety?</li> </ul>	Speakers session 1 and 2  Moderated by Marco Dozza, Chalmers/SAFER
12:40-13:50	Lunch	

13:50-14:30	<p>Session 3: How to acquire answers on the main questions in NDS?</p> <ul style="list-style-type: none"> <li>• What are the relevant events to be identified in the data?</li> <li>• What types of analysis will provide answers?</li> <li>• What could be the role of NDS in Field Operational Tests?</li> </ul>	
13:50	Defining safety critical events, report from the FOT-Net working group	Mikael Ljung Aust, Volvo
14:05	Data analysis issues for NDS	Adrian Zlocki, IKA, presented by Yvonne Barnard
14:20	Synergy between NDS and FOTs, how can NDS methods and data be used in a FOT?	Tibor Petzoldt, Technical University Chemnitz
14:35	Panel discussion on the generalisation of data and outcomes of NDS	Moderated by Eline Jonkers, TNO
15:00-15:20	Coffee break	
15:20-16:45	<p>Session 4: Stakeholders' needs and use of outcomes</p> <ul style="list-style-type: none"> <li>• What outcomes are expected by different types of stakeholder involved in FOTs and NDS?</li> <li>• How can NDS results be deployed?</li> <li>• How can we make use of the large sets of data gathered in NDS and FOTs?</li> </ul>	
15:20	Stakeholders needs analysis and deployment, results and implications of the European stakeholder needs analysis	Eike Schmidt, BAST,
15:35	Deployment of NDS results in industry	Mikael Ljung Aust, Volvo
15:50	Re-use of NDS data	Helena Gellerman, SAFER
16:15	The new FOT-Net Data project	Sami Koskinen, VTT
16:30	Expectations of NDS outcomes by the European Commission	William Bird, European Commission, (cancelled due to illness)
16:45	Closing remarks and next steps	Yvonne Barnard, ERTICO – ITS Europe
17:00	Workshop close	

## 2.6.2 Introduction

This workshop was organised in collaboration with the UDRIVE project.

The focus of the workshop was on Naturalistic Driving Studies (NDS). NDS can be defined as “A study undertaken to provide insight into driver behaviour during everyday trips by recording details of the driver, the vehicle and the surroundings through unobtrusive data gathering equipment and without experimental control”.

This stakeholder workshop addressed the following questions:

- What is the current status of Naturalistic Driving studies?
- What role can Naturalistic Driving play within Field Operational Tests, and what is the synergy between these two types of studies?
- What are the interests and needs of stakeholders?
- How can the results of Naturalistic Driving Studies be deployed?
- What can be done with the large amount of data that is gathered in NDS?

In this stakeholder workshop we paid attention to different types of NDS (both from Europe and the US) and with different types of vehicles (cars, trucks, powered two-wheelers and bicycles).

Results from the different working groups in FOT-Net were presented in relation to NDS.

[All presentations are available a the FOT-NET website](#)

The meeting started with the introduction of all participants and also those who could not participate due to illness. Yvonne Barnard presented the agenda for the day and the objectives of the workshop. The FOT-Net project and its objectives were introduced. FOT-Net is a support action funded by the European Commission to network Field Operational Test activities at European, National and International levels. NDS are also included. FOT-Net will finish at the end of March 2014, but a new support action, FOT-Net Data will take over the networking activities. This project was later presented by its coordinator, Sami Koskinen (VTT). FOT-Net has five working groups: Data analysis, Events and incident definition, Ethical and legal issues, Impact assessment and scaling up, and Data sharing. Results from some working groups were presented during the day. These working groups feed their results into a new revision of the FOT-methodology as described in the FESTA handbook. This new version will be available in the beginning of 2014 at the FOT-Net website (<http://www.fot-net.eu/en/library/>) and wiki. The latest Newsletter (no12) was handed out, and is also available on-line:

<http://www.fot-net.eu/download/Newsletter/03642fotnetnewsletteroct04art.pdf>.

## 2.6.3 Session 1: NDS in Europe and US

In this session, Rob Eenink (SWOV) presented UDRIVE, the European Naturalistic Driving Study. Ken Campbell (Transport Research Board) presented SHRP2, the US Naturalistic Driving Study.

The following questions were addressed:

- What are the objectives and main research questions?

- What benefits can be expected from the outcomes of the studies?
- How will the data collected be used in and outside the projects?
- What is the current status of the project?

### **UDRIVE: the European Naturalistic Driving Study**

UDRIVE started 13 months ago with the aim to study driver and rider behaviour, in order to contribute to the EU targets on road safety and environment. UDRIVE will study characteristics of everyday driving, crash causation factors and associated risks, inattention and distraction, car drivers interacting with pedestrians and cyclists, motorcycle behaviour, and driving styles in relation to eco-driving.

UDRIVE has seven operation sites in Germany, Spain, Austria, France, Poland and the UK. The vehicles that will be instrumented with an advanced Data Acquisition System (DAS) are cars, trucks and motor cycles. Participants will drive/ride for 21 months. The research questions necessitated a complex DAS, with a variety of cameras (8 for cars and trucks). Rob Eenink described the complexity of such a project, with many partners and stakeholders. The project will gather more data than it will be able to analyse, but the database will be made available for analysis after the project by both project partners and other experts, taking into account legal and ethical restrictions. More information at: [www.udrive.eu](http://www.udrive.eu).

### **SHRP2: the US Naturalistic Driving Study**

Ken Campbell (the SHRP2 Chief Program Officer for Safety) presented SHRP2, the Largest Naturalistic Driving Study ever undertaken, with 1,900 light vehicles on the road, and 3 years of data collection.

There are six data collection sites in the US. The data collection will be completed at the end of November 2013, and then data processing, enhancement and analysis will start. They are currently collecting supplementary data from sites such as the annual average of daily traffic, weather, work zones, crashes etc. 3152 participants have now completed their driving, performing 5 million trips, generating 3995 vehicle years of data (above the target of 3900). 522 known crashes were identified; there are probably more in the database.

It took almost 1½ years until the target participant number was reached. Recruitment of younger drivers was a problem, as they have older cars that could not be equipped with a DAS accessing the CAN bus. It was decided to include these cars and use only GPS speed data because with young drivers interesting things are going on.

An attempt was made to link driving records with cell phone voice and texting logs. 30% of the participants were willing to allow access to this data, but not all the providers would release the data. An option was for the participants to hand in their printed use of texts and cell phone. However, Ken Campbell was not too optimistic about the success of this sub study.

The complexity of the study relates to the different data types collected and to be analysed: categorical data (such as age of the driver), sampled data (such as speed), and video data from 4 cameras that need to be coded.

In order to be able to use the data in the future, the database needs to be maintained and finance for that have to be found.

Interested researchers can use the data for analysis after training. Data are made available on the Data Access Website: <http://insight.shrp2nds.us/>

The audience had questions on interviews with drivers. Interviews were conducted when there is a crash. Also detection of alcohol use was discussed; this appeared to be very difficult.

More information about SHRP2 at: [www.trb.org/SHRP2/safety](http://www.trb.org/SHRP2/safety)

### **2.6.4 Session 2: NDS with two different types of vehicles**

In this session the focus was on NDS with two-wheelers. The following questions were addressed:

- What are the objectives and main research questions?
- What benefits can be expected from the outcomes of the studies?

#### **Naturalistic cycling studies**

Marco Dozza (SAFER) presented his work on Naturalistic Cycling studies. Even if the number of road fatalities is overall decreasing, cyclist fatalities are constant or even increasing. Understanding accident causation is crucial, as more than 2000 cyclists are killed yearly (6-7% of total traffic fatalities) 70% are “single accidents” and most deaths are on intersections. Naturalistic Cycling Studies investigate road user behaviour, such as distraction and obedience of rules. As the number of cyclists is growing, and more cyclists use e-bikes (1.2M e-bike in 2012) with a higher speed, this is becoming even more important. New apps on smartphones promise to help cyclists, so these ITS need to be tested. Results from the BikeSAFE project, performed with 20 cyclists in the Gothenburg area, show how cyclists obey to traffic rules, and how intersections, road maintenance, and interaction with other road users are contributing factors to accident causation. Preliminary results from the e-BikeSAFE project raise safety concerns about fast e-Bikes. In the BikeSAFE project the instrumented bicycle has a simple push button with which the cyclist can indicate unsafe situations. There are not yet many NDS studies with bicycles, but next to Sweden, Marco Dozza identified projects in Spain, Austria and Germany. An instrumented bicycle is also participating in the US Safety Pilot project.

#### **Naturalistic motorcycle studies**

Martin Winkelbauer (KFV) presented his work on Naturalistic Motorcycle Studies. Their Naturalistic Riding included 12 motorcycles, driving for 2 years, and is currently ramping down. They used the hardware and software developed by IFSTTAR in the 2BeSafe project. 2BeSAFE was a pilot study on NDS with four sites in four countries with one type of motorcycle at each site, focussing on hardware and software development, event detection (riders were asked about the events), and feasibility of NDS.

KFV also performed site based studies with permanent cameras to detect drivers' trajectory in bends Martin Winkelbauer also described the Motorcycle Safety Foundation's 100 motorcycle naturalistic study in the US, performed by VTTI.

It is difficult to find safety critical events for motorcycles compared to cars, because you cannot see the eyes of the driver, so in UDRIVE the movements of the helmet will be detected.

Benefits of Naturalistic Riding Studies are getting a wider insight in road user behaviour, and objective data on subjective issues, allowing to get a better understanding of what is „normal“. This information is needed for safety research not to be exclusively “accident research” anymore, but to focus on earlier stages in the chain leading to accidents. NRS is able to identify a different kind of risk factors, and supplements current methods.

### **Panel discussion on different types of vehicles**

Marco Dozza led a panel debate with the speakers of session 1 and 2 on common issues for natural driving studies vehicles:

Some issues addressed were:

Comparability of data: UDRIVE is using the same DAS for cars, trucks and motorcycles. So the data formats will be comparable and common.

Maybe we should shift from looking at safety critical events as predictors for accidents to situations on the road that are not desirable, even if they do not lead to an accident. NDS can teach us more about what is “normal” and what the personal limits are for drivers, and especially motor riders, as well as driving styles. We can then look at “outliers”: events that are not “normal”.

Alcohol: use differs between motorcycles and cars. “It is not possible to drive a (heavy) motorcycle when you are drunk”. The contrary is true for alcohol and bicycles. Many people are using bikes under the influence of alcohol.

Relevance of data in the future: Records “kept in store” from NDS will only stay relevant for those parameters that do not change. For example, when some ITS (such as blind spot detection for trucks) are commonly used behaviour may change.

Communication between different types of vehicle: This will be addressed in UDRIVE.

Static cameras: Would it be better to use cameras in intersections? It is not a matter of better or worse. Site videos create too much data, but only for one spot, – while you can extract the important data from NDS videos. It will also depend on the research question, such as, do you want to study drivers’ behaviour when they meet other road users. The advice was given to think about research questions that could be common between studies on different types of road user. Especially in the urban environment synergy may be found between the results from NDS with different types of road user.

### **2.6.5 Session 3: How to acquire answers on the main questions in NDS?**

In this session we looked at the analysis of the data and the results of NDS. The following questions were addressed:

- What are the relevant events to be identified in the data?
- What types of analysis will provide answers?
- What could be the role of NDS in Field Operational Tests?

## Defining safety critical events

Michael Ljung Aust (Volvo) gave a presentation on defining safety critical events. His presentation was based on the report of the FOT-Net working group on Events and incident definition (available at [http://www.fot-net.eu/en/networking/working\\_groups/events\\_and\\_incident\\_definition\\_.htm](http://www.fot-net.eu/en/networking/working_groups/events_and_incident_definition_.htm)).

As crashes are very rare events, we need something to stand in for the crashes to estimate safety risks. The basic idea is that less severe, but still critical, events can be used as surrogates

There are many possible dimensions to be considered when identifying safety critical events (CRE):

- Critical pre-response kinematics
- Critical response kinematics
- Drivers' level of surprise or fear
- The reaction of the video analyst: "That looks dangerous"
- Event being very unusual given the driver's history
- Any combination of the above

Ideally, one would select and compare only CREs to be predictive of actual crash involvement. However, this relationship is problematic, in published studies explicit descriptions on the connection between the CRE they use and crash risk is often lacking. Four theoretical approaches in general are used in the analysis, based on driver response, function response, driving context, and driving history. It is not obvious which approach is the best one.

Definitions may also be a moving target, for example, when vehicles are equipped with a certain ITS (for example, when all new trucks have AEBS), will activation events be considered as normal operation or as CREs? Skidding or losing friction CREs went down with the introduction of ABS. So data may easily lose their importance as technology develops.

CRE definitions are not yet solid enough, so in the revised FESTA handbook, not one definition will be made canonical. However, it is important that analysts explain and justify which definition they use in order to be able to make comparisons between studies. The readers of the handbook will be provided with an easy to read introduction to CRE selection and the choices that need to be made when defining them. However, no definite recipes that can be used off the shelf without reflection will be given.

## Data analysis issues for NDS

Yvonne Barnard (ERTICO) presented Adrian Zlocki's slides (IKA) (in his absence) on Data Analysis issues for NDS. This presentation is based on the report of the FOT-Net working group on Data analysis (available at: [http://www.fot-net.eu/en/networking/working\\_groups/data\\_analysis.htm](http://www.fot-net.eu/en/networking/working_groups/data_analysis.htm))

Four types of issues were identified in the working group, based on experiences from a variety of FOTs:

Issues with experimental design. Examples are participants who are not representative so that comparisons between different driver profiles are not possible. Issues with the selection of vehicles may lead to information needed for the analysis not being collected. Sometimes

scenarios are too rare, for example, certain weather conditions. Also the duration of the data acquisition can be inadequate. Choices have to be made in the experimental design: In depth analysis of few research questions versus general analysis of many research questions, this is especially a concern for uncontrolled NDS data). A focus on fewer research questions may lead to more scientifically sound results.

Issues with collection and storage. Again the question should be raised whether to record everything or just a set of selected data. The relevant accuracy of data needs to be determined beforehand. A question arising from experience in FOTs is how to get the driver to fill in questionnaires? Apps on smartphones may be a solution.

Issues with data processing. Large amounts and frequencies of data cause long processing times, so careful planning of the analysis process is necessary.

Issues with data analysis. There is a research need for advanced data analysis techniques and tools (e.g. video analysis, map matching technologies). Automated analysis techniques are needed to be able to analyse large data sets. Manual video analysis is difficult and costly. Standardisation is needed of tools and definitions (like event definition), also within the project when more than one group is performing analyses.

### **Synergy between NDS and FOTs**

Tibor Petzoldt (Technical University Chemnitz) discussed NDS and FOTs. The definitions in the FESTA handbook are: FOT: “A study undertaken to evaluate a function, or functions, under normal operating conditions in environments typically encountered by the participants using quasi-experimental methods”. NDS: “Naturalistic Driving refers to studies undertaken using unobtrusive observation when driving in a natural setting.” One could also look at the purpose of the study: A FOT addresses the question of how a change in driver behaviour occurs (due to the use of an ITS). In NDS the focus is on why problems occur (or do not occur). There are many similarities, so it is not difficult to find synergies. There might even be no difference between the research questions in FOTs and NDS. Tibor Petzoldt gave examples from several different FOTs and NDS, showing a wide variety in numbers of participants, goals and duration. The baseline of some FOTs is a NDS, because no functions are being used. Also part of the driver behaviour in a FOT is not influenced by the system. In NDS drivers will also use (nomadic) devices, so this may provide interesting information on the use of functions. NDS data may also serve as baseline data for a FOT. NDS can provide a better understanding of driver behaviour in general to predict behavioural changes/adaptations as a result of the introduction of a new system/function, and may help to formulate better informed hypotheses. In the future FOTs may also study compete technologies, not only functions. An example is the German naturalistic e-bike study. So differences between the two types are not so important. Tibor Petzoldt’s conclusion was therefore: no matter if you are doing NDS or FOT...collect, collect, collect and then exploit, exploit, exploit.

### **Panel discussion on the generalisation of data and outcomes of NDS**

The panel discussion was led by Eline Jonkers (TNO), chair of the FOT-Net working group on Impact Assessment and scaling up. (The report is available at: [http://www.fot-net.eu/en/networking/working\\_groups/impact\\_assessment\\_and\\_scaling\\_up.htm](http://www.fot-net.eu/en/networking/working_groups/impact_assessment_and_scaling_up.htm))

Issues discussed were:

You can get the same data from NDS and FOTs; the question is whether some systems in FOTs would change driving behaviours amongst other road users, i.e. ACC.

Would we be better off by controlled NDS? Instead of saying to people that they can drive as they would, they should maybe have controlled tasks, for example, drive in the dark, on certain roads etc.

If you do not know what is going on, then you will need an NDS to find out. If you know what is going on, then it is a FOT.

With a NDS you can find interesting behaviours, and in a FOT you can investigate how to take measures to influence the behaviours or how to manage them, e.g. through ACC.

### **2.6.6 Session 4 – Stakeholders needs and use of outcomes**

The following questions were addressed:

- What outcomes are expected by different types of stakeholder involved in FOTs and NDS?
- How can NDS results be deployed?
- How can we make use of the large sets of data gathered in NDS and FOTs?

#### **Stakeholders needs analysis and deployment**

Eike Schmidt (BASt) presented the outcomes of the FOT-Net workpackage on stakeholders' needs and deployment strategy. The report (draft deliverable D6.2) is available at: [http://www.fot-net.eu/download/Deliverables/fot-net2\\_del\\_6\\_2\\_25-10-2013\\_final.pdf](http://www.fot-net.eu/download/Deliverables/fot-net2_del_6_2_25-10-2013_final.pdf).

41 stakeholders who were involved in a wide range of European and national FOTs answered open and closed questions in a questionnaire about their experiences, needs and expectations. Analysis of their answers provided a rather positive picture of FOTs and the use of the results. For most stakeholders the FOT had met their expectations. Stakeholders indicated that they gained experience with FOTs collaboration with other organisations and partners, and business case related issues became more important. The majority also did not see problems with the application or use of the FOT results. Recommendations for the FESTA revision are: Strengthen the focus on deployment. As collaboration is so important, networking activities remain necessary, and will be continued in the FOT-Net Data support action.

#### **Deployment of NDS results in industry**

Mikael Ljung Aust, Volvo, described ways in which the automotive industry may use the results of NDS. Tuning of warnings of ITS is such a use. The tuning of thresholds of warnings is important to avoid the driver getting annoyed by too many or irrelevant warnings. For example, there exists a point-of-no-return beyond which a vast majority of drivers is incapable of avoiding a collision. If autobrake/autosteering were allowed to act in relation to this point, more time and space would be available for avoidance. NDS results can help define this point empirically. Warning should be given early enough to avoid a crash, but not so early drivers think the car is “crying wolf” all the time. This limit seems to vary between individuals; drivers accept different margins when driving. Another example is drowsiness detection. A system can give warnings according to the driver and the situation. NDS may

provide information about whether drivers need to be warned and what actions they may be able to take.

### **Re-use of NDS data**

Helena Gellerman (SAFER) discussed how NDS data can be re-used by other projects/researchers and for other research questions.

A major question is how to create a global data-sharing platform, with well-defined procedures, templates, data sharing agreements and financial models, standard requirements, and a catalogue of available datasets and tools.

We now have huge data sets from recently ended FOTs. Benefits of data sharing are efficient return on invested budget and avoiding repeating data collection. Data sharing enables meta-analysis across studies, and comparisons between specific groups (e.g. older drivers) in different contexts and countries. In order to strengthen global research and research communities, trust is needed between organisations.

Open-data and big-data are currently concepts that are in the centre of attention. However, sharing this data poses many challenges, such as different project funding schemes, IPRs, and legal settings. Data need to be documented, a sharing platform needs to be created and maintained, and data handling after projects needs to be financed. While sharing data privacy of participants needs to be respected, and data protected. Examples were given from the UDRIVE project, where data will be made available to others after the project, such as a consent form for participants to agree on future use of their data.

### **The new FOT-Net Data project**

Sami Koskinen (VTT) is the project coordinator of FOT-Net Data; he presented this support action. This third round of FOT-Net will start in January 2014 and even though it is called Data, this does not mean the networking activities will be cancelled. Since 2008 the EU has invested over 80 million euros in FOTs; and these projects have collected valuable data sets of long-time use of the latest functions and driving behaviour of thousands of participants.

Since many FOTs have taken longer to implement than expected not all data has been fully used, and considering the effort collecting the data, it is a pity it is not used to a greater extend. Therefore, the FOT-Net Data project has been set up in order to support this use.

FOT-Net Data supports efficient sharing and re-use of global data sets. It will develop and promote a framework for sharing data. It will build a detailed data catalogue and maintain the tools catalogue on the wiki. Furthermore the networking activities will be continued.

### **2.6.7 Closing remarks and next steps**

Yvonne Barnard (ERTICO) made closing remarks summarising some of the main conclusions drawn during the day. FOTs and NDS are not so different. Safety behaviour is becoming more of a focus in NDS, not only looking at safety critical events. Finding the comfort zone of the driver will help to better understanding of behaviour but also to improve ITS, tuning it to driver and situation. NDS provides the opportunity not only to look at incidents but also at their histories.

NDS provides valuable knowledge about the interaction between different types of vehicle, results from different studies with different types of road user can complement each other.

It is clear from experience that NDS are complex, and have issues with funding, effort and timing.

Results from NDS need to be deployed. In NDS behaviour is studied, which will lead to recommendations to manage behaviour, and finally to make vehicles more interactive. As new types of vehicle are being developed and come to market (like e-bikes and fully automated cars), NDS will remain a moving target, new behaviours are to be discovered.

Finally, for both FOTs and NDS, collaboration between projects and stakeholders, also at a global level, is crucial, so openness and sharing data are main objectives.

Yvonne Barnard concluded with the next steps. FOT-Net reports and deliverables, the revised FESTA handbook, an updated FOT brochure, and a dissemination guide will be available at the beginning of 2014. A final FOT-Net will take place beginning of March 2014.

And furthermore: FOT-Net Data will start in January, UDRIVE will start data collection in the summer, and SHRP2 is starting to get results.

The 9th ITS European Congress will be 4-7 June 2014 in Helsinki.

To follow the latest news, visit:

[www.fot-net.eu](http://www.fot-net.eu) for FOT-Net news

[wiki.fot-net.eu](http://wiki.fot-net.eu) for information about FOTs and NDS

[www.udrive.eu](http://www.udrive.eu) for information about the UDRIVE project

[www.trb.org/SHRP2/safety](http://www.trb.org/SHRP2/safety) for information about SHRP2

All presentations of this workshop are available at the FOT-Net website: [http://www.fot-net.eu/en/networking/stakeholders\\_meetings/10th\\_fot-net\\_stakeholder\\_workshop\\_on\\_naturalistic\\_driving\\_studies.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/10th_fot-net_stakeholder_workshop_on_naturalistic_driving_studies.htm)

## 2.6.8 List of participants

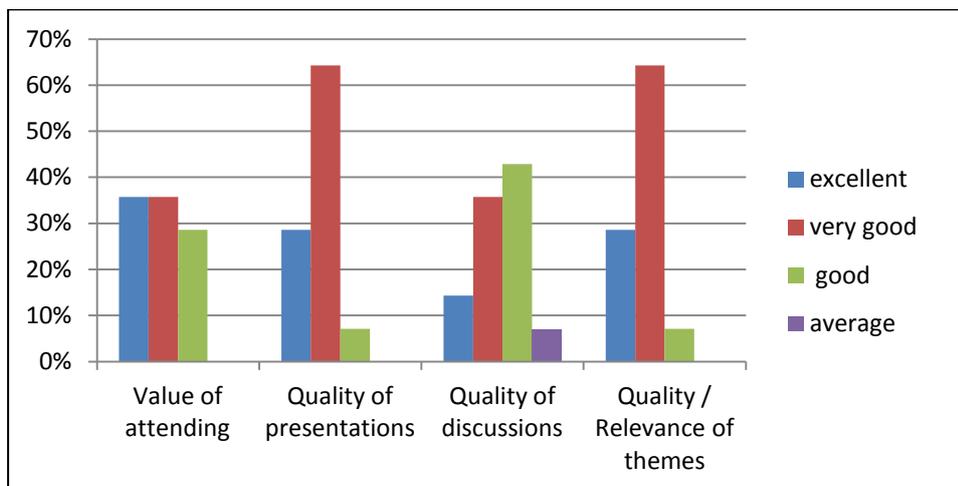
**Table 7 List of participants 10<sup>th</sup> stakeholders workshop**

Organisation	Last name	First name
BASt	Schmidt	Eike
Chalmers	Dozza	Marco
CTAG	García	Eva
ERTICO-ITS Europe	Barnard	Yvonne
ERTICO-ITS Europe	Flament	Maxime
FEMA	Delhayé	Aline
Hasselt University - Transportation Research Institute	Polders	Evelien
KFV	Winkelbauer	Martin
LAB	Guyonvarch	Laurette
LAB PSA Peugeot Citroën - Renault	Josseume	Françoise
MIRA Ltd	Shehata	Nadia
neurotraffic	Gatscha	Michael
OC Mobility	Spronck	Ingrid

<b>POLIS</b>	Friis	Gustav
<b>SAFER</b>	Gellerman	Helena
<b>SWOV</b>	Eenink	Rob
<b>Technical University Chemnitz</b>	Petzoldt	Tibor
<b>TNO</b>	Jonkers	Eline
<b>TRB</b>	Campbell	Ken
<b>University of Leeds</b>	Thomasson	Erik
<b>University of Leeds</b>	Pampel	Sanna
<b>Verkehrsunfallforschung an der TU Dresden GmbH</b>	Hannawald	Lars
<b>Volvo Car Corporation</b>	Ljung Aust	Mikael
<b>VTT</b>	Koskinen	Sami
<b>WIVW GmbH</b>	Landau	Andreas

Number of participants	25
Number of women – men	11 - 14
Associations/user groups/European Commission	6
Industry	5
Universities/research organisations	12
Road operators/public authorities	1
Other/unknown	1

### 2.6.9 Feedback



**Figure 4 Feedback 10<sup>th</sup> stakeholders workshop**

In total, 14 feedback forms were returned.

## 2.7 FOT-Net final event

[http://www.fot-net.eu/en/networking/stakeholders\\_meetings/fot-net\\_final\\_event\\_and\\_first\\_fot-net\\_data\\_workshop.htm](http://www.fot-net.eu/en/networking/stakeholders_meetings/fot-net_final_event_and_first_fot-net_data_workshop.htm)

### 2.7.1 Agenda

09:30 – 10:00	Welcome coffee and registrations	
<b>10:00 – 11:30</b>	<b><u>Looking back on FOT-Net</u></b>	
10:00	Welcome and opening by the chairman of the event	Han Zwijnenberg, TNO
10:15	Message from the EC project officer	Myriam Coulon-Cantuer, European Commission, DG Connect
10:30	FOT-Net overview of activities: networking FOTs	Yvonne Barnard, ERTICO – ITS Europe
10:50	FOT-Net overview of activities: promoting the FESTA methodology	Haibo Chen, University of Leeds
11:10 – 11:30	Coffee Break	
<b>11:30 – 12:30</b>	<b><u>Looking back on the FOTs</u></b>	
11:30	Experiences with FESTA in euroFOT and DRIVE C2X	Adrian Zlocki, IKA Sami Koskinen, VTT
11:45	Experiences with FESTA in TeleFOT and UDRIVE	Helena Gellerman, SAFER
12:00	FESTA in FOTsis and CIP pilots	Yvonne Barnard, ERTICO - ITS Europe
12:10	International collaboration: Experiences from the US FOTs	Dale Thompson, US DOT
12:30 – 13:40	Lunch Break and FOT-Net photo exhibition, vote for your favourite FOT picture!	
<b>13:40 – 14:20</b>	<b><u>The FOT-Net legacy</u></b>	
13:40	The FOT-Net wiki	Adrian Zlocki, IKA
14:00	The revised FESTA handbook	Roberto Brignolo, CRF
<b>14:20 – 15:00</b>	<b><u>Deployment of the results</u></b>	
14:20	Stakeholders needs	Eike Schmidt, BAST

14:35	Deployment strategy	Tom Alkim, Rijkswaterstaat
14:50	Promoting FOT results	Gustav Friis, Polis
15:00 – 15:30	Coffee Break	
15:30 – 17:00	<b><u>Looking forward</u></b>	
15:30	Panel discussion on The future of FOTs, with representatives from Academia, Public sector and Private sector	<ul style="list-style-type: none"> <li>• Tom Alkim, Rijkswaterstaat</li> <li>• Jorge Alfonso Kurano, Polytechnic University of Madrid (UPM)</li> <li>• Roberto Brignolo, CRF</li> <li>• Dale Thompson, US DOT</li> </ul>
16:45	Wrap-up and Hand-over of FOT-Net2 to FOT-Net Data	Yvonne Barnard, ERTICO – ITS Europe, and Sami Koskinen, FOT-Net Data Coordinator, VTT
17:00 – 18:00	Reception and drinks	

## 2.7.2 Looking back on FOT-Net

### Welcome and opening by the chairman of the event, Han Zwijnenberg, TNO

Han welcomed participants to what he described as an opportunity to show off the FOT-Net legacy and showcase some of the FOTS as well as to formally hand over the legacy to the follow-on project 'FOT-Net Data. Testing and trials, he said, are important ways to gain understanding but this is not easy in a fragmented mobility field. FOT-Net has created knowledge sharing opportunities to bring it together.

### Message from the EC project officer, Myriam Coulon-Cantuer, European Commission, DG Connect Welcome and opening by the chairman of the event, Han Zwijnenberg, TNO

Myriam Coulon-Cantuer from EC DG CONNECT emphasized how FOT-Net provided the necessary network for all the projects on FOTs. Thanks to supporting materials and seminars, FOT-Net 2 delivered a revision of the FESTA methodology, built a FOT knowledge base through the FOT-Net wiki and website and generated new knowledge via working groups. Myriam emphasized the project set the bar very high and delivered excellent results which will create high expectations vis-à-vis the FOT-Net Data project that will succeed the FOT-Net 1 and 2 projects. The main successes had been:

- Networking (national, European and global)
- Supporting (through materials and seminars)

- FESTA handbook revision (including an extension for Co-operative Systems and Naturalistic Driving Studies)
- Building the knowledge base (FOT-Net Wiki and website)
- Generating new knowledge (through five Working Groups)
- Analysing stakeholder needs (and advising stakeholder)

### **FOT-Net overview of activities: networking FOTs, Yvonne Barnard, ERTICO – ITS Europe**

Yvonne Barnard, the Project Coordinator, described the complex project structure of workpackages, stakeholders and the networking platform that make up FOT-Net 2 – describing it as a ‘One-Stop-Shop’ for FOTs. Its principal activities had been to **Inform, Discuss, Share and Promote**.

**Informing** had been achieved through a range of workshops, deliverables, reports, and brochures as well as through the website and Wiki.

**Discussion and sharing** had been addressed through 6-monthly stakeholder workshops to discuss progress with stakeholders from industry, academia, public authorities, consultancies and user-organisations. International workshops and smaller group discussions had also been held at the ITS World Congress. Sharing would be important for the follow-on FOT-Net Data project.

**Promotion** of the FESTA methodology for FOTS had been continued and the FESTA handbook revised twice whilst all the major FOTS had been promoted through the networking and dissemination platform.

### **FOT-Net overview of activities: promoting the FESTA methodology, Haibo Chen, University of Leeds**

Haibo described how the work on updating FESTA had been substantial and had involved seminars and workshops for knowledge transfer with the working groups in particular being set up for deeper discussion and analysis of key areas and the identification of challenges, solutions and further work.

Haibo described the five Working Groups in turn (Data Analysis, Events and incident definition, Legal and Ethical, Impact assessment and Scaling up and Data Sharing). He also explained how seminars had been designed with a balance of expert presentations, discussion and interactive working sessions. The seminars had been attended by 126 people from 68 organisations in 14 countries with 90% of participants rating the sessions as ‘good’ or very good’.

## **2.7.3 Looking back on the FOTs**

### **Experiences with FESTA in euroFOT and DRIVE C2X, Adrian Zlocki, IKA, Sami Koskinen, VTT**

Adrian Zlocki described how the completed euroFOT project (a FOT on the use of ADAS in real traffic) had closely followed the ‘Analysing’ phase of FESTA (hypothesis through to answer). For example, the study on Adaptive Cruise Control had ultimately demonstrated an

82% decrease in incidents during the treatment phase and also a 3% saving in fuel consumption.

Sami Koskinen described Drive C2X (a cooperative ITS FOT in its final stages on 7 test sites). Sami stressed the need to gather high-quality, harmonised and well documented data. The Drive C2X experience had been that FESTA underestimates the time needed to prepare the data – importing, converting, validating, preparing metadata). The final Drive C2X event will be in mid-July 2014.

### **Experiences with FESTA in TeleFOT and UDRIVE, Helena Gellerman, SAFER**

Helena began by presenting Professor MariAnne Karlsson's slides on TeleFOT – a 4 year project which had developed trials of nomadic devices according to standard FESTA procedures. Research Questions had benefited from a combined bottom up and top down approach considering 'if', 'when', 'how' and 'why' and usage patterns over time. It was suggested that the relationship between objective and subjective data is important in answering research questions.

Helena also summarised UDRIVE – the European Naturalistic Driving Study involving 19 partners on 7 test sites. The FESTA methodology had been deeply adopted across all stages with work package leaders from the later stages of the project being involved in the early stages of project definition too. Data sharing is a major challenge, with remote access being set up to a central data centre at SAFER (Sweden). A very large number of RQs have been reduced now to a manageable number. Legal and ethical issues of data sharing require a common participant agreement which adheres to local data sharing requirements. UDRIVE is therefore a test-bed for a data sharing platform and therefore provides a bridge between FOT-Net2 and FOT-Net Data.

Q&A: There seem to be opportunities to share progress on issues with the US, where Federal versus State laws can give similar issues to those encountered between different European countries.

### **FESTA in FOTsis and CIP pilots, Yvonne Barnard, ERTICO - ITS Europe**

Yvonne Barnard described how in the research to deployment chain, FOTS are in the middle, but pilots are closer to deployment. FOTsis comprises 9 test sites in Spain, Portugal, Germany and Greece looking at vehicle- to- vehicle and vehicle-to-environment communications. FESTA had been adopted in order to obtain the most significant results in assessing impact.

A special seminar had been held (In Barcelona, March 2013) for the CIP pilots and this had strengthened collaboration and the development of a common assessment framework. It had also highlighted certain issues for FESTA, such as the need to harmonise definitions and also, the challenges in scaling up findings to a Europe-wide level.

### **International collaboration: Experiences from the US FOTs, Dale Thompson, US DOT**

Dale Thompson introduced the US 'Safety Pilot Model Deployment' project (in Ann Arbor, Michigan) which had completed in August 2013 and had shown that connected vehicles and environmental and safety applications can be effective. Lessons learned from the 1.5 year study of 300 vehicles on 73 miles of instrumented roadway were:

- Develop an outline framework only, as documentation will need to evolve
- Finding an ideal test site is a challenge – need to trade-off must-haves vs nice-to-haves
- Need to understand what motivates participants
- Infrastructure support at the pilot site needs a strong local partner
- Devices evolve – you need to phase updates to technology/equipment
- It can be challenging to replicate in the lab, problems/issues with devices that have been encountered in the field
- Verify data requirements and processes prior to data collection

Questions and answers:

Q. What do you do differently in the US, what can we learn? A. 'I'm taking lessons from you home – and the FESTA handbook'

Also, for early implementation, people need to trust your results are valid and transferable to other cities

There is no evidence that after-market safety devices were any worse than integrated devices.

#### **2.7.4 The FOT-Net legacy**

##### **The FOT-Net Wiki, Adrian Zlocki, IKA**

Adrian Zlocki began by explaining that a unique aspect of FOT-Net is to share and maintain information and hand it over to the community. The starting point was a collaborative effort (with nearly 650 registered contributors) to create a catalogue that would be available initially across FOT-Net, and now to the whole community, the contents of which include:

- List of FOTS worldwide
- List of tools to help conduct a FOT
- On-line FESTA handbook
- Glossary of terms
- 'Hot topics' (FOT of the month)

To date, 147 projects are covered including NDS and Pilot projects. In February 2014 there were 437 pages of content and there had been 890k views since its launch.

It is a tool 'for and by the FOT community' and as a wiki, it can be added to by anyone who wishes to register and create an account.

##### **The revised FESTA handbook, Roberto Brignolo, CRF**

Roberto explained the process of updating the FESTA handbook which had involved five Working Groups feeding into a workshop and writing session (November 2013); the creation of an enhanced draft and input from across the FOT community. The final version is now ready.

All chapters have been updated with the latest input from currently running FOTS plus new thematic content from the additional five working groups.

Working Group 1 on Data Analysis had clustered information into main categories of: experimental design, data collection, data processing and data analysis, leading to a number of improvements to FESTA.

Working Group 2 on Event and Incident Definition has been a new addition to FESTA which had looked at Crash Relevant Events as a proxy for crashes which are very rare and therefore difficult to research directly. This work had not produced a definitive canonical answer that could be stated in FESTA, but suggests a number of useful approaches.

Working Group 3 on Legal and Ethical Issues had extended assessment topic that had previously only been described from the German perspective - the main objective being to develop a more integrated view, with the addition of national involvement from Spain, Italy, Netherlands and France. The FESTA handbook has subsequently been updated on privacy issues for data sharing but the study has highlighted that FOTS will always need to seek legal advice at their national level because of different national regulation.

Working Group 4 on Impact Assessment and Scaling Up determined that there is no single ready-to-use scaling up approach. Good data is essential and for this multiple data sources were recommended (rather than relying on just one). Analysts must know the limitations of the sample (balancing a representative sample against it being imperfect) and to do this, it is essential that analysts are involved from the beginning of the project. The expectations of policy makers need to be managed since they are always high.

Working Group 5 on Data Sharing has extensively reviewed this issue and proposed the development of a data sharing platform. It was recommended that project documentation is key to this, for example the Consortium Agreement and individual Participant Agreements sets the legal and ethical requirements to what data can subsequently be shared. This Group also found that data providers are however reluctant to share data as this can expensive and time consuming.

### **2.7.5 Deployment of the results**

#### **Stakeholders needs, Eike Schmidt, BAST**

Eike presented an overview of a stakeholder survey that had been undertaken, and in particular on responses from 41 FOT stakeholders who had been involved in FOTs (the full stakeholder need analysis is available in Work Package 6, Deliverable D6.2 on the website). Quantitative questions had been analysed and a content analysis had been undertaken on open qualitative questions to capture these comments within the overall findings. Although the survey sample size means the results are descriptive rather than statistical, they do provide a valuable appreciation of the FOT instrument.

Expectations before and after the FOT were analysed and the results showed positive feedback overall, with the majority stating that FESTA was helpful and that they had not had a problem in applying it. The two most positive experiences (expressed in terms of the revealed gain in reported importance score after involvement in a FOT) were **Collaboration** and **Business Case** development. A recommendation for FESTA was to strengthen collaboration and the focus on the re-use of data (which will indeed be the focus of the follow-on FOT-Net data).

### **Deployment strategy, Tom Alkim, Rijkswaterstaat**

Tom summarised a view on how to move from FOT to deployment based on results and remarks from stakeholder workshops. There are a number of benefits of FOTs (scientific results, tools developed, experience gained etc) but ultimately stakeholders will want the initiative implementing 'on the road'. A FOT can be very helpful in developing the necessary relationships, cooperation and trust between parties to bring deployment closer. Advice when implementing a FOT in a city includes:

- Involve the city as a stakeholder asap
- Align the FOT with the city's existing mobility objectives
- Include a socio-economic Cost Benefit Analysis so the city understands 'what's in it for them'

Tom provided the FREILOT project as a good example of success where Helmond city had deployed at the end of a FOT. Success factors listed there included:

- A sound existing mobility policy
- A pragmatic approach (the focus was allowed to shift as new stakeholders joined the project)
- Viable business models were considered at the start of the FOT
- All stakeholders were involved from the start.

Tom concluded with the recommendations that there should be an increased focus in FOTs on deployment and a more prominent role for deployment on the FOT-Net wiki. There should be a focus on collaboration in FOTs and a shift from proof of concept to realisation. Lessons learned from pilots should be incorporated in FESTA.

### **Promoting FOT results, Gustav Friis, Polis**

*Gustav described the Dissemination Guide that was produced in 2011 and the 3 good practice examples that were added to this in 2014. Primary communication channels are the FOT-Net website and the wiki – both of which will be maintained through FOT-Net Data. The Guide recommends that dissemination events should take place at practical events where there will be a relevant captive audience.*

Use should also be made of the media – both the specialised press and the general media (a choice being made in accordance with the type/complexity of the message). Gustav recommended that the use of digital media and video is a powerful PR tool. The rise in Twitter also means that projects can effectively move from a traditional approach of providing formal 6-monthly project updates to 5-minute social media updates.

The FOTs joint dissemination activity was cited by Gustav as a good practice example but he urged participants to look at the long list of useful tips in the Dissemination Guide and 'be inspired!'

### **2.7.6 Looking forward**

**Panel discussion on The future of FOTs, with representatives from Academia, Public sector and Private sector, Tom Alkim, Rijkswaterstaat, Jorge Alfonso Kurano, Polytechnic University of Madrid (UPM), Roberto Brignolo, CRF, Dale Thompson, US DOT**

Han Zwijnenberg (TNO) chaired this session which was delivered around a number of set statements for the panel to consider, plus supplementary questions from the audience.

*Statement 1: "We have developed enough experiences from FOTS to move to deployment"*

Tom: The 3-year strategic initiative in the Netherland from 2015 provided a good opportunity. There is a balance between what can be predicted from theory and what is tested through a FOT. We need more than just an 'educated guess' that something might work, but equally, to be a 100% sure before deployment, a FOT would take a very long time!

Jorge: 'Yes, with reservations' around certain services such as safety.

Roberto: It is important to go step-by-step and make sure that the benefits are communicated to the public. The ITS corridor for example is a good initiative with perceivable benefits for users. He also said that the legal framework could be an important constraint and that political intervention is required to address legal obstacles such as liability.

Dale: In the US, each State is similar to an EC country with its own laws. Even though the Safety pilot had been a success and showed the technology was ready, however it had not resolved deployment issues. Data issues are also important – for example, who owns the data? Plus there is a lack of roadside infrastructure – who will pay for this and how can investment in it be encouraged?

*Statement 2: "Don't focus on reasons you can't deploy, focus on reasons why you can"*

Roberto: The basic mission is always safer cars so if the technology is proved and legal aspects are overcome it will be good business for car makers in the end. The OEM industry is working hard on this and the chain is moving.

Han: What about the role of the after-market? Other ICT industries could take this market (e.g. Google and Apple) rather than just the car industry. Is the car industry leaving it to them?

Roberto: Good services are only possible once there are enough instrumented vehicles on the road, therefore retrofit would be a good opportunity. And retrofit is the best solution to reach a critical mass.

Jorge: One problem seen by FOTs is the reluctance from OEMs, road operators and stakeholders. Standardisation is needed to avoid stakeholders holding back.

Dale: The Safety Pilot in the US has taught us that the private sector is ready to go. Interoperability and standards (between US, Europe and Japan) is needed.

*Statement 3: "Open data is critical for cooperative ITS but the issue of data needs to be solved"*

There was insufficient time for this statement to be considered by the panel, but this fact was seen to be an ideal open question to leave for the handover to the follow-on project FOT-Net Data!

### **Wrap-up and Hand-over of FOT-Net2 to FOT-Net Data, Yvonne Barnard, ERTICO – ITS Europe, and Sami Koskinen, FOT-Net Data Coordinator, VTT**

Yvonne thanks the people involved in the organisation, the Project Officer, partners and associated partners, stakeholders and event participants and also asked the audience to thank each other as having been great partners.

The aim of the Support Action was to build a community of people with different background and we can say that we have succeeded. FOT-Net Data will build on this focussing on data sharing and re-use.

Yvonne closed the event with her famous last words: “Please fill in the evaluation form!”

### **2.7.7 List of participants**

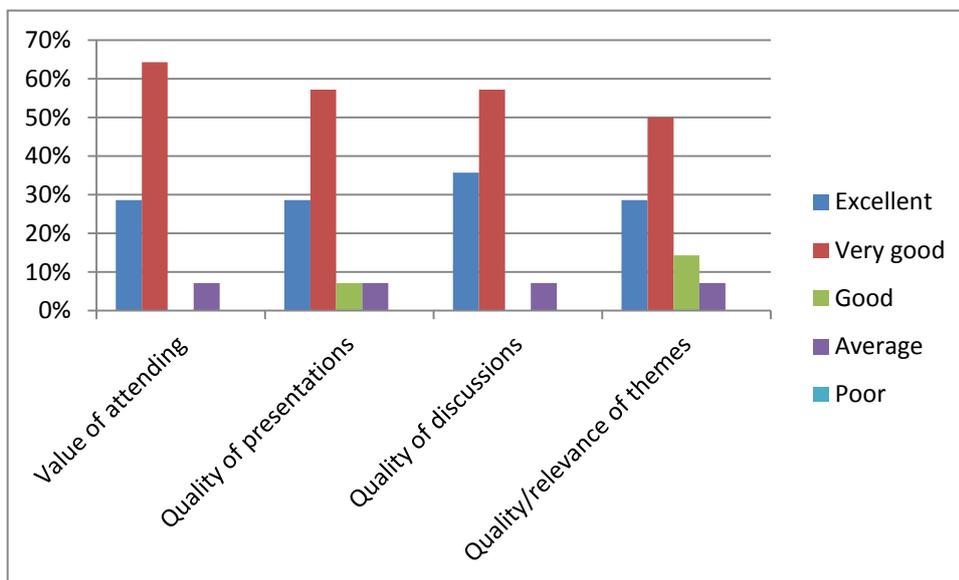
**Table 8 List of participants final event**

Organisation	Last Name	First Name
Aalborg University	Agerholm	Niels
ADAS	Hagleitner	Walter
ANWB	Botman	Wil
AustriaTech	Helfert	Matthias
BASt	Schmidt	Eike
Booz Allen Hamilton	Kandarpa	Ram
Bussmo	Osterholt	Lucas
CEESAR	Krishnakumar	Reakka
CEESAR	Val	Clément
Chalmers	Wallgren	Pontus
City of The Hague	Molenschot	Toine
Connekt	Devreeze	Marije
CTAG	Rial	Moisés
Empa	Martins	João
ERTICO - ITS Europe	De Rycke	Maria
ERTICO - ITS Europe	Pelfrene	Patricia
ERTICO - ITS Europe	Barnard	Yvonne
ERTICO - ITS Europe	Flament	Maxime
European Commission	Coulon Cantuer	Myriam
FIAT Research Center	Brignolo	Roberto
IKA	Zlocki	Adrian
LAB PSA Peugeot Citroën	Josseume	Françoise
Loughborough University	Welsh	Ruth
MAPtm	Broeders	Wim
NetPort Science Park	Jonsson	Mats
OC Mobility Coaching	Knaap, van der	Rien
POLIS	Friis	Gustav
Rijkswaterstaat	Alkim	Tom
Rijkswaterstaat	Bloembergen	Folkert
Rijkswaterstaat	Verweij	Fred
SAFER	Gellerman	Helena

<b>SWOV</b>	van Nes	Nicole
<b>TASS International</b>	van Vugt	Gwen
<b>TNO</b>	Hoedemaeker	Marika
<b>TNO</b>	Zwijnenberg	Han
<b>University of Leeds</b>	Chen	Haibo
<b>University of Leeds</b>	CHEN	XUDONG
<b>University of Leeds</b>	Pampel	Sanna
<b>University of Leeds</b>	Thomasson	Erik
<b>UPM</b>	Alfonso Kurano	Jorge
<b>US DOT</b>	Thompson	Dale
<b>Volvo Car Corporation</b>	Petersson	Mats
<b>VTT</b>	Koskinen	Sami
<b>VTT</b>	Innamaa	Satu
<b>VUFO</b>	Hannawald	Lars
<b>WIVW GmbH</b>	Landau	Andreas

Number of participants	46
Number of women – men	13 - 33
Associations/user groups/European Commission	10
Industry	5
Universities/research organisations	18
Road operators/public authorities	6
Other/unknown	7

### 2.7.8 Feedback



**Figure 5 Feedback final event**

In total, 14 feedback forms were returned.

### 3 International workshops

The objective of the FOT-Net International Workshops is to contribute to the establishment of a global FOT network in order to exchange knowledge, best practices and foster cooperation for FOT activities. Concrete issues were identified to be addressed by the international FOT network. This activity has strengthened the cooperation between FOT activities and their stakeholders leading to faster and effective take up of Intelligent Transport Systems and Services.

Three international workshops were organised. The international workshops have inherited their numbering in FOT-Net 2 from FOT-Net 1. Hence the first international workshop in FOT-Net 2 is called the 4th international workshop.

The following international workshops took place:

**Table 9 List of International workshops**

16/09/2013	4th International Workshop	Orlando
21/09/2012	5th International Workshop	Vienna
14/10/2013	6th International Workshop	Tokyo

All international workshops have agenda's, reports, participant lists and presentations available at the website:

[http://www.fot-net.eu/en/library/international\\_workshops/](http://www.fot-net.eu/en/library/international_workshops/)

The structure of the following sections is as follows:

- Agenda.
- The full report of the meeting, usually structured by the different sessions and round tables.
- The list of participants, with statistics on number of participants, gender, and region. Classification is sometimes not very exact, not from all participants the gender is known. Also the participant list was not always complete.
- For the last workshop the feedback from the evaluation forms which were handed out during the meeting to participants. Note that not all participants did fill in the forms.

### 3.1 4th International Workshop

[http://www.fot-net.eu/en/networking/international\\_workshops/fot-net\\_4th\\_international\\_workshop\\_orlando\\_usa\\_-\\_presentations\\_available.htm](http://www.fot-net.eu/en/networking/international_workshops/fot-net_4th_international_workshop_orlando_usa_-_presentations_available.htm)

#### 3.1.1 Agenda

Round Tables	08:00	<b>Registrations</b>
	08:15	<b>Introduction to the Round Tables</b> Irina Silva & Maxime Flament, ERTICO – ITS Europe
	08:30	<b>FOT-Net Round Tables</b>
		<p><b>RT 1 – Cooperative Systems FOTs across the globe - What should be harmonized at this stage and what not?, Chairperson: Tom Alkim, RWS</b> Meeting room: Lake Concord A</p> <p><b>RT 2 – Actions linking to Deployment, Chairperson: Teresina Herb, BASt</b> Meeting room: Lake Concord B</p> <p><b>RT 3 – Tools for FOTs, Chairperson: Adrian Zlocki, IKA</b> Meeting room: Lake Hart A</p> <p><b>RT 4 – Setting priorities for Large Scale Naturalistic Driving observations, Chairperson: Nicole van Nes, SWOV</b> Meeting room: Lake Hart B</p>
Plenary session (Lake Lucerne)	12:00	<b>Lunch (outside Lake Lucerne room)</b>
	13:00	<b>Welcome: FOT Network platform activities: update and meeting objectives</b> Irina Silva, ERTICO – ITS Europe
	13:15	<b>Welcome from the Regions: Introduction on FOT activities</b> Europe: Emilio Davila-Gonzalez, Research Programme Officer, DG INFSO, European Commission US: Mike Schagrin, Program Manager, ITS Safety, US Department of Transportation Japan: Koichi Sakai, Senior Researcher, Ministry of Land, Infrastructure Transport and Tourism
	13:45	<b>Recommendations from the Parallel Round Tables:</b> Recommendations and future action items on global harmonization of Cooperative Systems FOTs & Discussion, Chairperson: Tom Alkim, RWS Recommendations and future action items on Actions linking to Deployment & Discussion, Chairperson: Teresina Herb, BASt
	14:15	Coffee break

14:30	<p><b>Recommendations from the Parallel Round Tables (cont.):</b></p> <p>Recommendations and future action items on Tools for FOTs &amp; Discussion, Chairperson: Adrian Zlocki, IKA/Aachen University</p> <p>Recommendations and future action items on priorities for Large Scale Naturalistic Driving observations &amp; Discussion, Chairperson: Nicole van Nes, SWOV</p>
15:00	<p><b>Conclusions and relevant FOT presentations during the Congress</b></p> <p>Maxime Flament, ERTICO – ITS Europe</p>
15:30	<p><b>Adjourn</b></p>

### 3.1.2 Introduction

#### Workshop objectives

A series of Round Tables were organised at FOT-Net's Fourth International Workshop addressing FOT issues that have been identified as of high priority to the FOT community. An international panel of FOT experts was invited to debate in each round table. Other experts and stakeholders were welcome to participate to the round tables as observers. During the afternoon session, conclusions from the round tables were presented and discussion was open to the general FOT community who validated these conclusions.

General objectives of this workshop include:

- Reinforce the global FOT network in order to exchange knowledge, best practices and foster cooperation for FOT activities.
- Support the coherent development and implementation of FOTs at European and International level.
- Increase the cooperation between FOT activities and their stakeholders leading to faster and effective take up of Intelligent Transport Systems and Services.

### 3.1.3 Round tables

#### RT 1 – Cooperative Systems FOTs across the globe - What should be harmonized at this stage and what not?

Chairperson: Tom Alkim, RWS

Dilemma:

- desire to do cooperative FOTs now and gain further insights in the effects of the cooperative approach as well as getting experience in working together with the relevant stakeholders towards deployment
- desire to be future proof, have a complete scope (safety, throughput, environment and comfort; V-V and V-I; urban and interurban; US, Japan and Europe as well as China, India, Russia, Korea, South Africa, etc.) and use worldwide accepted standards

Both desires are hard to unify. Deployment of Cooperative Systems is unlikely to happen overnight, so what iterative, comprehensible and non-regrettable steps can be taken at this stage and what are the implications for (the design) of cooperative systems FOTs.

Topics: Harmonization of cooperative FOTs, a tool or a goal in itself? To what extent should we try to harmonise cooperative FOTs in Japan, US and Europe? What can we do to learn from each other's experiences?

Panellists:

- Mike Schagrin, US DOT
- Prof Hironao Kawashima, Keio University
- Gerard Ségarra, Renault
- Steve Shladover, University of California PATH Program
- Ronald Adams, Chairman 2011 at EasyWay

## **RT 2 – Actions linking to deployment**

Chairperson: Teresina Herb, BAST

Topics:

- How do different Stakeholders make use of FOT results?
- Which contributions to deployment and policy decision making have been made so far?
- What were the major obstacles?
- What are the expectations on current FOT results from a public (policy making) perspective?
- What are the expectations on current FOT results from an industry perspective?
- What are the lessons to be learned from the US experiences?

Panellists:

- Emilio Davila-Gonzalez, DG INFSO - European Commission
- Jane Lappin, Volpe Center, US Department of Transportation US DOT
- Koichi Sakai, National Institute for Land and Infrastructure Management, Ministry of Land, Infrastructure, Transport and Tourism
- Miguel Seisedos, Iridium Concesiones de Infraestructuras S.A., FOTs coordinator
- Darrell Bowman, VTTI

## **RT 3 – Tools for FOTs – From data acquisition to data analysis**

Chairperson: Adrian Zlocki, IKA/Aachen University

Topics:

- Which tools are necessary in order to perform FOTs – Data acquisition, data management, data analysis
- Tools for video analysis – advantages and disadvantages

- Tools for CAN data analysis – advantages and disadvantages
- Usage of existing tools vs. new development of tools
- Experience and lessons learned from tools used in previous FOTs

Panellists:

- David Sanchez, CTAG
- Mohamed Benmimoun, IKA/Aachen University
- David LeBlanc, UMTRI
- Masao Fukushima, Nissan

#### **RT 4 – Setting priorities for Large Scale Naturalistic Driving observations**

Chairperson: Nicole van Nes, SWOV

For a large scale study, ideally in depth data would be collected from a large fleet of vehicles and this would be enriched with additional data about the surrounding of the vehicle and other road users. In reality the budget will require to make choices and how many vehicles to equip, what equipment to use and which additional data to collect.

- The value of in-vehicle data and the importance of the different measures.
- To what extent can vulnerable road users (pedestrians, motorcycles, bicycles) be studied with naturalistic driving observations from instrumented cars?
- Smart Phone Applications seem very promising. It is a cheap way to collect basic data from a large fleet of vehicles and other road users. What data can be gathered through a Smart Phone Application? What topics could be studied based on this (limited) data? What topics need additional measure? What additional measures are needed? Would it be possible to take these measures with additional (wireless) modules (camera's, sensors, etc.)
- Does a Smart Phone Application satisfy the need for data on other road users, pedestrians, motorcycles, bicycles?
- What is the added value of site based observations to study vulnerable road users?
- PTW and bicycles could also be fully instrumented with a DAS and camera's. What is the added value equipping a fleet of PTW or bicycles?

Panellists:

- Trent Victor, SAFER Vehicle and Traffic Safety Centre at Chalmers
- Chiyomi Miyajima, University of Nagoya
- Tom Dingus, Virginia Tech Transportation Institute

#### **Round table process**

The presentations of the round table panellists should be shared with other panellists of the respective round table in advance. Presentations should have answered the questions identified for the respective round table.

Exchange of information and discussion can already take place via email prior to the day of the round table.

The number of slides per panellists is limited to a maximum of 5. Each panellist will be given 5 minutes to present and 3 minutes of Q&A per panellist.

The remaining time was dedicated to discussion and preparation of a synthesis to be presented at the Plenary Session.

Panellists spent little time together, so it was important that all panellists provide their presentations in advance and respected their presentation time slot during the session (5 minutes presentation plus 3 minutes Q&A). Panellists can however bring some background material in order to support their position during the discussion.

Each round table is coordinated by a Chairperson, who will present the synthesis of the discussion during the Plenary session. During this session the Discussion will be open to the general FOT community.

Other experts and stakeholders that attended the workshop are welcome to participate to the round tables as observers.

### **3.1.4 Plenary session: Introduction**

Irina Silva (ERTICO – ITS Europe) opened the plenary session by presenting the work that is going on in FOT-Net. She explained the meeting objectives (see above).

### **3.1.5 Welcome from the regions**

For Europe Emilio Dávila González (European Commission, DG Information Society and Media, ICT for transport Unit) explained why FOTs can be a good contribution toward deployment. Large-scale FOTs are seen as an excellent way of:

- collecting real data and making a comprehensive assessment
- fine-tuning the standards
- evaluating the impact
- analysing driver behaviour
- evaluating user acceptability
- providing cost/benefit assessments
- creating awareness
- improving socio economic acceptance
- enhancing the take-up of ICT solutions

FOTs can help to reach EU policy goals by helping the EC to measure the impact on key transport challenges, to establish the right policy framework and to identify further investments in research and development. FOTS therefore should obtain sound statistical conclusions, create user awareness, promote common standards and raise the visibility of the contribution of ICT to the quality of life.

For the US Mike Schagrin (Intelligent Transportation Systems Joint Program Office, Research and Innovative Technology Administration) presented the work that is been done in

the US Safety Pilot. This is the world's most extensive real world deployment of connected vehicle safety. The Safety Pilot aims to obtain enough quality empirical data to give confidence in our 2013 and 2014 decisions. It expects to establish public awareness, understanding, and acceptance of this breakthrough safety technology, and to understand options for accelerating benefits through aftermarket capability. Finally it will identify additional research gaps that need to be addressed prior to a nationwide implementation.

For Japan Koichi Sakai (National Institute for Land and Infrastructure Management, Ministry of Land, Infrastructure, Transport and Tourism) presented the progress of "ITS Spot service". ITS Spot services are using high-speed, large capacity communication between road side equipments called "ITS Spot" and corresponding car navigations. 1,600 ITS Spots have been installed on expressways of nationwide. There are 3 basic services of ITS Spot services: (1) Dynamic Route Guidance, enabling car navigation equipment to receive traffic information from large areas and select the optimum route smartly; (2) Assisting Safety Driving, providing advanced warning and related information when drivers have unexpected troubles on the road ahead, and (3) ETC (electronic Toll Collection).

### ***3.1.6 Recommendations from Round Table 1: Cooperative Systems FOTs across the globe - What should be harmonized at this stage and what not?***

Tom Alkim (Rijkswaterstaat) presented the conclusions and the recommendation from Round Table 1.

A benefit of (worldwide) coordination of cooperative FOTs is efficiency, by learning from each other (success and mistakes). Methodological rigor applied internationally helps make results more credible. For this coordination a mechanism is needed, such as a website with overview of all initiatives/FOTs, repository of results, and data. It's beneficial to have one place to share all the information on cooperative systems FOTs, including the data.

Concerning the need for a (worldwide) focus on "day one" applications, there were different opinions. Some were against, because requirements and priorities are different in different regions. Others were positive about the need for such a focus because of the (lack of) resources but also the complexity. The conclusion was to start with a focus on limited set of applications.

Having a (worldwide) agreed upon evaluation methodology could be beneficial, an adapted FESTA methodology could be used for that, as well as an agreement on indicators for evaluation.

For the short term a focus on both demonstrations to show the added benefit of the cooperative approach (policy) and on worldwide harmonized deployment (standards and technology) are important.

Who should be in the lead in FOT deployment (public, private, academia, road operators, service providers, ...) depends on focus of FOT (safety, ... mobility, etc.) and it is related to responsibility. FOTs lead to deployment, so all stakeholders should be involved. The most important is that someone takes the lead.

We can learn from each other's experiences by sharing meaningful data (leading to investment decisions, and sharing plans beforehand).

The question was raised what comes first: making systems cooperative? or making cooperative systems? Migrating path towards cooperative systems goes through legacy systems, if you can make existing systems cooperative, do it. It was recommended to define decision milestones, to be supported by results of the FOT, and to design your FOT towards this.

### ***3.1.7 Recommendations from Round Table 2: Actions linking to Deployment***

Teresina Herb (BASt) presented the conclusions and recommendations from Round Table 2.

Different stakeholders make different use of FOT results.

- Industry: Improve research results / specifications / products, contribute to standards
- Operator (private, public): Possible solution for problems, informed investment decisions, improve services, justify investment
- Administration: Regulatory decisions, funding decisions, deployment decisions, awareness, contribute to standards
- Planners: recommendations for investments
- General: Education, promotion and awareness

Major obstacles to deployment are critical mass, penetration rates, costs versus scope, time, involvement of needed parties, technical problems.

Contributions to deployment will be impressive results from FOTs, providing a better understanding of impact of new services. It is necessary to well define research questions and deployment and operation priorities. Business models need to be identified and understood. To enhance deployment it is recommended to have working groups with all stakeholders discussing results. Pay attention to organizational issues (roles and responsibilities). Standards are a key element in deployment.

Expectations on current FOT results from a public (policy making) perspective are expected impact (cost-benefit, traveller behaviour, public acceptance, system effectiveness), reliability, long-term return of investment, and the identification of areas for investment (research, deployment). The industry expects results in the areas of market acceptance, standards, profitability, product and service refinement, liability, quality of service, and the opening/entering of new markets.

Lessons learned from the US are in the areas of:

- The development of traffic information services
- Relation between FOTs and deployment
- Rich dataset for data mining by FOTs under naturalistic conditions
- Impact of federal funding driving deployment
- Impact of national leadership

Final recommendations from this round table are:

- Facilitate access to FOT data and information (regional, national, international) for future research, and decision making and policies.
- Repository for data / information collection is needed.
- Use FOTs as initial platform for stakeholder exchange.
- Ensure quality and comparability of approach, design, and methods (peer review).
- Pay attention to the comparability of data and results.

### **3.1.8 Recommendations from Round Table 3: Tools for FOTs**

Adrian Zlocki (IKA) presented the results from Round Table 3. This round table made conclusions on the experiences in the three regions.

#### **Japan:**

The FOT Sky Project was discussed as example. The tools used are the customer's car navigation, and existing communication tools for data monitoring. The focus is on roadside data loggers (velocity sensor, video camera, car data communication), but also video data from vehicles are available.

Issues are that it is difficult to analyse video data, there are also concerns with privacy of CAN data.

Lessons learned are that it is important that drivers are not being conscious of test. Test persons participated because of incentives, not because of the test purpose. Long term testing is of importance, it requires an extensive process to test new software (equal to production software). Cooperative tests are not very successfully, because special test cars are necessary and people drive not in a naturalistic way, but drive very carefully.

#### **US:**

There is a lot of experience with prototype technologies. Processes, hardware and tools are used, which are known from experimental work, therefore a lot of knowledge from conventional testing experienced was utilized from the very beginning. Issues with tracking tools are similar to software development tools used in order to solve hardware and software problems.

#### **Europe:**

The euroFOT project was discussed as example. Focus was on vehicle data only, no roadside unit information. Experience showed that early specifications of necessary signals for logging is important. Vehicles at one test-site cannot be modified for FOT as they are sold to customers, therefore vehicles are driven naturalistically, but no video data is available. Very complex data management is needed to ensure quality and provide enriched data for analysis. No modular tools for data management are available, always extensive adaptation work is necessary, data management was underestimated at the beginning. Only selected data is recorded for evaluation, research questions need to be defined in detail before data logging starts.

Some general conclusions are that the piloting phase is of extreme importance for ANY tools. Data storage needs to be conveniently sized. The data tool to be used in vehicles is often a compromise between costs and the amount of data.

Some recommendations are:

- A scenario manager is needed for Cooperative systems.
- Data synchronization between roadside units and vehicle data is a big challenge.
- Check on data quality is important in order to answer research questions.
- Ownership of data needs to be clarified.

Finally Adrian Zlocki brought the FOT-Net wiki under the attention where descriptions for tools for FOTs are being collected: [http://wiki.fot-net.eu/index.php?title=Tools\\_for\\_FOTs](http://wiki.fot-net.eu/index.php?title=Tools_for_FOTs)

### ***3.1.9 Recommendations from Round Table 4: Setting priorities for Large Scale Naturalistic Driving observations***

Nicole van Nes (SWOV) presented the conclusions of the fourth round table.

For a large scale Naturalistic Driving study, ideally in depth data would be collected from a large fleet of different vehicles types (car, truck, motorbike, bicycle), and this would be enriched with additional data about the surrounding of the vehicle and other road users. In reality the budget will require to make choices on how many vehicles to equip, what equipment to use and which additional data to collect. Setting priorities is not easy.

Questions and issues addressed in this round table were:

- The value of in-vehicle data and most important measures.
- How to study vulnerable road users (pedestrians, motorcycles, bicycles) based on naturalistic driving observations from instrumented cars.
- Are smart phone applications a cheap way to collect basic data from a large fleet of vehicles and from other road users (pedestrians, motorcycles, bicycles)?
- The added value of site based observations to study vulnerable road users.
- PTW and bicycles could also be fully instrumented with a DAS and camera's.

Key topics to be studied in Naturalistic Driving Studies are:

- Crash risk & causation
- Distraction and inattention
- Vehicle/ITS
- Vulnerable road users
- Road design
- Fatigue and drowsiness
- Eco driving
- Monitoring road safety
- Road pricing

### 3.1.10 Conclusions and summary

Maxime Flament (ERTICO – ITS Europe) concluded the workshop with some overall conclusions. These are exciting times for FOTs and NDS around the world, and there is a strong support from the regions for these studies. It is recommended to capitalise on previous research. Comprehensive assessment of impact is key, and preparing for making deployment decisions need to be based on facts.

Some key statements from the round tables:

- Don't wait for the end of your FOT to think about deployment
- Contribute to kill the chicken & egg problem for deployment
- Share results:
  - Make sense out of the FOTs results
  - Make sure FOT results are comparable
  - Gather FOT results in a knowledgebase
- Share data:
  - Identify best ways to share data
  - Map where you can find comparable data
  - Re-use data for new research
  - Solve the ownership of data
- Join forces for data collection and management tools
  - Contribute to repository of FOT tools
  - Guidelines? Best Practices? Generic tools?
- Every study should aim to be a building block for future meta studies (Monitoring, accident causation, distraction, vulnerable road users)

### 3.1.11 List of participants

Table 10 List of participants 4<sup>th</sup> international workshop

Organisation	Last name	First name	Country
Aalborg University	Agerholm	Niels	Denmark
AustriaTech	Boehm	Martin	Austria
BASt	Herb	Teresina	Germany
Blekinge Institute of Technology	Mbiydzenyuy	Gideon	Sweden
C2C-CC	Hess	Soeren	Denmark
Chalmers University	Franzen	Stig	Sweden
EasyWay	Adams	Ronald	The Netherlands
ERTICO - ITS Europe	Flament	Maxime	Belgium
ERTICO - ITS Europe	Kompfner	Paul	Belgium
European Commission	Davila-Gonzalez	Emilio	Belgium
Fraunhofer SIT	Bissmeyer	Norbert	Germany
IKA/Aachen University	Benmimoun	Mohamed	Germany
ITS Japan	Kobayashi	Shigeo	Japan
Keio University	Kawashima	Hironao	Japan
MAP Traffic Management	Broeders	Wim	The Netherlands
Mines ParisTech	de La Fortelle	Arnaud	France
Ministry of Transport	Louette	Eric	France
NEC Europe Ltd.	Baldessari	Roberto	Germany
Newcastle University	Bell	Margaret	UK

<b>Nippon Koei</b>	Fujitaka	Katsumi	Japan
<b>Nippon Koei</b>	Mochizuki	Atsushi	Japan
<b>Nissan</b>	Fukushima	Masao	Japan
<b>OHL Concesiones</b>	García-Linares	Federico	Spain
<b>Queensland University of Technology</b>	Feng	Yanming	Australia
<b>Rijkswaterstaat</b>	Alkim	Tom	The Netherlands
<b>TNO</b>	de Kievit	Martijn	The Netherlands
<b>TNO</b>	Klunder	Gerdien	The Netherlands
<b>Transport Canada</b>	Battista	Vittoria	Canada
<b>UMTRI</b>	LeBlanc	David	US
<b>University of Nagoya</b>	Miyajima	Chiyomi	Japan
<b>USDOT-RITA-Volpe Center</b>	Lappin	Jane	US
<b>Virginia Tech Transportation Institute</b>	Dingus	Tom	US
<b>VTT</b>	Koskinen	Sami	Finland
<b>VTTI</b>	Bowman	Darrell	US

Number of participants	34
USA/ Canada	5
Japan	6
Australia	1
Europe	22

## 3.2 5th International Workshop

[http://www.fot-net.eu/en/networking/international\\_workshops/fot-net\\_5th\\_international\\_workshop.htm](http://www.fot-net.eu/en/networking/international_workshops/fot-net_5th_international_workshop.htm)

### 3.2.1 Agenda

<b>Round Tables</b>	08:00	<b>Registrations</b>
	08:15	<b>Introduction to the Round Tables</b> Irina Silva & Maxime Flament, ERTICO – ITS Europe
	08:30	<b>FOT-Net Round Tables</b>
		<p><b>RT 1 – Data Analysis, Chairperson: Adrian Zlocki, IKA</b> Meeting room: Krieau 1</p> <p><b>RT 2 – Impact Assessment &amp; Scaling up, Chairperson: Eline Jonkers, TNO</b> Meeting room: Krieau 2</p> <p><b>RT 3 – Data Sharing in the context of Cooperative Systems FOTs, Chairperson: Mike Schagrin, US DOT</b> Meeting room: Prater 1</p> <p><b>RT 4 – Naturalistic Driving Studies - Event &amp; Incidents Definition, Chairperson: Mikael Ljung Aust, Volvo Car Corporation</b> Meeting room: Prater 2</p>
<b>Plenary Session</b> Meeting room: Prater 3 + 4	12:00	<b>Lunch</b>
	13:00	<b>Welcome: FOT Network platform activities: update and meeting objectives</b> Irina Silva, Project Manager, ERTICO – ITS Europe
	13:15	<b>Welcome from the Regions: Introduction on FOT activities</b> Europe: Wolfgang Höfs, Head of Sector, DG CONNECT, European Commission US: Mike Schagrin, Program Manager, ITS Safety, Department of Transportation, US Japan: Shoichi Suzuki, Senior Researcher, ITS Division, National Institute for Land and Infrastructure Management, Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Japan
	13:45	<b>Recommendations from the Parallel Round Tables:</b> Recommendations and future action items on Data Analysis & Discussion, Chairperson: Adrian Zlocki, IKA Recommendations and future action items on Impact Assessment & Scaling up & Discussion, Chairperson: Eline Jonkers, TNO
	14:15	Coffee break
	14:30	<b>Recommendations from the Parallel Round Tables (cont.):</b> Recommendations and future action items on Data Sharing in the context of Cooperative Systems FOTs & Discussion, Chairperson: Mike Schagrin, US DOT Recommendations and future action items on Naturalistic Driving Studies -

		Event & Incidents Definition & Discussion, Chairperson: Mikael Ljung Aust, Volvo Car Corporation
15:00		<b>Conclusions and relevant FOT presentations during the Congress</b> Maxime Flament, Head of Sector SafeMobility, ERTICO – ITS Europe
15:30		<b>Adjourn</b>

### 3.2.2 Round Tables

#### RT 1 – Data Analysis – From hypotheses to results

Chairperson: Adrian Zlocki, IKA

Topics:

- Lessons learned and experience from large scale FOTs
- Choosing the right tools for data analysis
- Limitations of data analysis
- New approaches for data analysis, e.g. data mining techniques
- Research need to improve data analysis techniques

Panellists:

- Steven Reed, Loughborough University
- Mohamed Benmimoun, Institut für Kraftfahrzeuge (IKA)
- David LeBlanc, University of Michigan Transportation Research Institute (UMTRI)
- Marco Dozza, euroFOT, Chalmers University of Technology/SAFER, Sweden

#### RT 2 – Impact Assessment & Scaling up

Chairperson: Eline Jonkers, TNO

This round table session will discuss the methodological and practical issues surrounding the impact assessment of systems in FOTs, as well as the translation of results from the FOT to the regional, national and European levels.

Topics:

- How to carry out an Impact Assessment of a FOT? Which methodology can be used, what are the gaps in available methodologies?
- How to de-bundle effects in case combinations of systems are tested?
- How to compare results over different test sites?
- What are the influence and implications of different test designs in a FOT (naturalistic vs. controlled)?
- How can scaling up be carried out? To what geographic level? What level of detail can be achieved?

- Which data are needed for scaling up, and how can these data be obtained (either from FOT or from external data sources)?
- Are there (or should there be) universally valid procedures for scaling up?

Panellists:

- Stig Franzen, TeleFOT, Chalmers University of Technology/SAFER, Sweden
- Kerry Malone, DRIVE C2X, TNO
- Guillaume Saint Pierre, euroFOT, IFSTTAR
- Ryota Horiguchi, i-Transport Lab

### RT 3 – Data Sharing in the context of Cooperative Systems FOTs

Chairperson: Mike Schagrin, US DOT

The vast amount of data, collected in ever increasing number of larger FOTs worldwide, is a goldmine for the research on driver behaviour and evaluation of the performance and contribution of new (cooperative) systems. How can we enhance the sharing of data between researchers, to further explore already collected data? The EU-US Task Force on Data sharing and the FOT-Net working group on Data sharing are two groups that have focused this question during the past year, with special focus on Cooperative systems.

Topics:

- What are the main guiding principles for data sharing?
- Which data is most relevant for sharing? Should there be agreements on certain common data and data formats?
- How should we deal with ownership, legal and ethical issues to make data owners prepared to share their data?
- Which set-up and support is needed to make it worthwhile to approach
  - an unknown dataset?
  - several datasets with a common set of research questions? Are common access tools necessary?
- Is it possible to create a common international data sharing platform, what should it contain? How should it be handled and maintained?
- What are the challenges to be solved to create such a platform until 2016?

Panellists:

- Helena Gellerman, Chalmers University of Technology/SAFER, Sweden
- Thomas Benz, PTV
- Shoichi Suzuki, National Institute for Land and Infrastructure Management, MLIT, Japan

## RT 4 – Naturalistic Driving Studies - event & incidents definition

Chairperson: Mikael Ljung Aust, Volvo Car Corporation

The definition of events and incident is very relevant for ND (and FOT) studies investigating the relation of certain behaviour or technology use with crash risk. Given the limited number of crashes within a study, even within a large scale study, there is a lot to gain from a surrogate measure for crash risk.

This round table discusses the types of event definitions that have been used so far in NDS/FOT studies and discusses the definitions for events & incidents as developed within the FOT-Net Working Group. Typical events that are recorded in Naturalistic Driving/FOT studies will be presented and discussed in relation to the various event definitions applied.

Topics:

- What issues to consider when developing a definition on events and incidents?
- Could we aim for one general definition, or does the definition depend on the study objectives?
- Are events & incidents a good surrogate for crashes? For all types of crashes, or for some more than for others?
- The definition of events & incidents has implications on the results when for example odds ratios are calculated. If the events & incidents are not a proper surrogate for crashes, the results of the study are not valid. How do we know if the definition of incidents is well defined? How could we check this from the data?
- How can we investigate the relation between events & incidents and (the different types of) crashes? Should we set up a joint database including all recorded crashes?

Panellists:

- James Sayer, University of Michigan Transportation Research Institute (UMTRI)
- Ronnie Taib, NICTA, Australia

### Round table process

The presentations of the round table panellists should be shared with other panellists of the respective round table in advance. Presentations should have answered the questions identified for the respective round table. Exchange of information and discussion can already take place via email prior to the day of the round table.

The number of slides per panellists is limited to a maximum of 5. Each panellist will be given 5 minutes to present and 3 minutes of Q&A per panellist.

The remaining time was dedicated to discussion and preparation of a synthesis to be presented at the Plenary Session.

Panellists spent little time together, so it was important that all panellists provide their presentations in advance and respected their presentation time slot during the session (5 minutes presentation plus 3 minutes Q&A). Panellists can however bring some background material in order to support their position during the discussion.

Each round table is coordinated by a Chairperson, who will present the synthesis of the discussion during the Plenary session. During this session the Discussion will be open to the general FOT community.

Other experts and stakeholders that attended the workshop are welcome to participate to the round tables as observers.

### **3.2.3 Introduction**

A series of Round Tables were organised at FOT-Net's Fifth International Workshop addressing FOT issues that have been identified as of high priority to the FOT community. An international panel of FOT experts was invited to debate in each round table. Other experts and stakeholders were also on hand at the round tables participating as observers. During the afternoon session, conclusions from the round tables were presented and discussion was open to the audience who validated these conclusions.

The general objectives of the workshop were:

- Reinforce the global FOT network in order to exchange knowledge, best practices and foster cooperation for FOT activities.
- Contribute to the discussions of the FOT-Net Working Groups which have been set-up to tackle specific sets of issues to further enhance and revise the FESTA methodology for FOTs.
- Support the coherent development and implementation of FOTs at European and International level.
- Increase the cooperation between FOT activities and their stakeholders leading to faster and effective take up of Intelligent Transport Systems and Services.

Each round table addressed their own set of topics which can be found in more detail in the agenda.

The conclusions below report only the key statements given during each session of the workshop. More detail about the discussion that took place at each round table can be found in the round tables' presentations:

[http://fot-net.eu/en/our\\_services/international\\_workshops/vienna/workshop.htm](http://fot-net.eu/en/our_services/international_workshops/vienna/workshop.htm)

The recommendations given at each round table will be taken into account in the scope of the FOT-Net Working Groups during the course of 2013. The WG's recommendations will be integrated into a new version of the FESTA handbook to be released during the second semester of 2013.

#### **Countries attendance:**

Some 50 people attended FOT-Net's 5<sup>th</sup> International Workshop, coming from all key regions dealing with FOTs and NDS, some 20 from outside Europe. Naturally more people from Europe attended the workshop as the ITS WC was organised in Europe. Still 18% of the total participants came from Japan, 8% from the US and 6% from Australia, showing a growing interest from these countries in the FOT-Net activities.

### **3.2.4 Welcome from the Regions: Introduction on FOT activities**

Three presentations were given by representatives from Europe (EC-DG CONNECT), US (US DOT) and Japan (MLIT). Overall we can identify a great interest from the regions in conducting FOTs and a willingness to develop further global cooperation.

From the European side, there is currently a large investment in the support of the deployment of services namely in the area of Cooperative Systems. Many FOTs and Pilots are currently being conducted at pan-European level, assessing the benefits of the systems and services. A large amount of data is being collected from these activities and projects which is being used not only to address the questions identified in those projects but also to address future research topics. The European Commission is very much interested in making the data accessible and understanding how the data can be reused. Also, developing international cooperation with different regions is strongly encouraged. Concrete steps have already been taken in cooperation with the US and Japan. A tri-lateral framework is in place with agreements having been signed bilaterally among each region.

The US has clear objectives, targets and decision paths in place building up a basis for deployment. Research is being used to support policy making and implementation, with the US DOT already having planned that a number of decisions will take place between 2013 and 2015 as part of their ITS Joint Program. The US is focusing on cooperative systems as it is proven that 80% of the accidents can be addressed with this type of technology. User acceptance has been addressed in a number of Driver Clinics across the country and the findings show that 90% of the drivers would like to have such type of systems. In addition there are very heavy investments ongoing in the set up of affiliated test beds across the US. These test beds would serve as a tool to support full deployment.

In Japan the situation is different from Europe and US. Research on the benefits of cooperative systems has already lead to rapid deployment building an enabling infrastructure and leaving the deployment to the market players. FOTs and demonstrations have been conducted between 2007 and 2008. Deployment of 1600 ITS Spots over the main road network has taken place to exchange a limited set of data with focus on V2I. Probe data collection (consisting of the last 10-15 minutes of probe data information) is a central part of the deployment. Currently research is being conducted in the area of platooning, with a FOT starting in November 2012 and concluding in January 2013. A demonstration is planned for the next ITS WC in Tokyo in 2013.

### ***3.2.5 Key statements from the Data analysis round table***

The experiences of the panellists that were shared and discussed with the participants are:

#### Video Analysis

It is essential to understand safety analysis, but it produces high costs. Annotation of video and its costs are issues. Currently subjective rating of videos by manual annotation is the main method. Automated annotation methods are in research stadium, more work is necessary, but not all problems will be solved by automated annotation. Research on objective triggers will lead to reduction of the amount of video data which needs to be analysed manually or automated.

#### Analysis Tools

There are no formal or de-facto standards, different individual tools are developed and used in for specific projects with little long-term thinking. Standardization is partly available for accident data, this might also be done for FOT/NDS data in the future.

### Data Collection Strategy

Different data collection strategies are used: continuous data collection vs. event based data collection. The strategy to be chosen depends on the specificities of the project, e.g. safety relevant analysis may benefit from event based collection. Event based data collection requires clear understanding of problem before data collection starts. A mix of continuous and event based data collection is a good practice; collecting a continuous flow of data from a limited data set and collecting the full data set 30sec before and after an event is detected. For scenario-based cooperative systems FOT, the full data set collection can be triggered when an event is expected or planned in the scenario.

### Filter Data

Out of the collected data the most part is filtered out and only a selection of the data is used which raises a lot of questions on the data collection strategies and how to optimise the value and relevance of the data being collected without putting at risk future unforeseen investigations using the collected data.

### Analysis of driver relevant data

Even though Eye Tracking sounds like a great tool for driver observation, it remains a challenge. Different conditions (driver sizes, environment, glasses etc.) lower the quality of data collection possibilities. Video annotation in combination with eye tracking has proven more effective. However, the amount of data analysis work is huge.

Subjective data from driver may be collected. This kind of data acquisition works with incentives and chasing of data is necessary. The first experience is that travel diaries seem to work well. Issue for data analysis is that there may be different drivers for one car.

### Research needs for data analysis techniques

The following research needs were identified during the round table:

- Development of sophisticated models (taking into account context, conditions, driver etc.)
- Map matching technologies
- Automated video analysis
- Development of common analysis tools
- Tools for gathering data made available from different sources (weather, infrastructure sensors, incident detection, traffic data, etc)

### Organizational issues

Finally some organisational issues were raised when using a central data server with copies stored in other locations. Sharing data too quickly (for example if post-processing is not completed yet) led to problems difficult to fix when multiple copies exist.

## Next Steps (WG Data Analysis)

The next steps for the FOT-Net data analysis working group are:

- Derive recommendations on data analysis taking into account all input from the last weeks (interviews, round table, mails etc.)
- Revise the FESTA approach based on the results, taking into account the experiences gathered in conducted FOTs and NDSs
- Common workshop in which some of the experts will participate in order to present all results and have final discussions within FOTNET

## Summary of the discussion

In the discussion it was remarked that at the moment basis rules do not exist on how to conduct data analysis from FOT findings.

Manual video annotation is still the main tool to annotate the videos but this method is very demanding. A more automatic tool for video analysis is needed, although it is recognised that eye tracking is still a challenge.

The FOT-Net data analysis WG will issue recommendations, but it is key that data analysis experts remain open to new telematic technologies.

### ***3.2.6 Key statements from the Impact Assessment round table***

The working group on impact assessment produced a detailed report on the round table, which can be found on the FOT-Net website.

## Piloting

Piloting is carried out to test whether you can answer your research questions in the end. It is important that piloting is not only technical piloting, but that the whole data flow is tested, until and including impact assessment. It is also important to involve all partners in the project in piloting. A good practice from one of the FOTs (people working on subjective data collection and analysis) is to pilot yourself. Drive in a FOT vehicle, answer the questionnaires, fill in the travel diaries, etc. In this way you can test whether what you ask from the FOT participants is realistic. In the FESTA-V feedback loops from piloting should be made explicit, as well as making clear that the FOT should allow for contingency time. In short the suggested changes for the FESTA handbook in the piloting section stress the importance of testing the whole data flow, the idea of piloting yourself and making clear feedback loops and the need for contingency time.

## Participant selection and experimental set-up

Seasonal effects can really cause problems for explaining the effects that are found (and whether they are caused by the system under test, seasonal effects, or other circumstances). There are ways in which to (partly) deal with this: have a control group, or adjust the length of the test. The latter can mean that you either have a short time period for your FOT, so that baseline and treatment phase take place in the same season, or that you have a very long FOT (for example a year), so that baseline and treatment phase include the same seasons.

In quite some FOTs the treatment period is longer than the baseline period. There is not always a good reason for this (of course this depends on the type of system and FOT). In principle the baseline period should have the same length as the treatment period. When the experimental set-up is designed, make sure to put the sampling in the variability. Collect enough data where there is uncertainty. In short the suggested changes for the FESTA handbook in the section on experimental set-up check the text on length of the test (baseline and treatment), test design and sampling. Make changes when above outcomes are not included and/or put more emphasis on some parts.

### Safety impact assessment

Safety effects can be split in two types of effects: a change in exposure (e.g. decrease in mileage) and a change in driving behaviour. With regard to changes in driving behaviour, there are large gaps in knowledge for safety impact assessment: the relation between measures and accidents is not known. At the moment different approaches are used, for example: Qualitative / expert judgment (looking at the data, at previous studies, etc.), Speed-accident relationships, eIMPACT method, and Event based analysis. All these methods are not perfect and not usable in all situations. In the end it is about the relative change (e.g. what is the percentage of accidents that can be prevented because of a certain system, compared to driving without this system).

Other ways to gain insight in changes in safety are for example looking at the frequency of events (e.g. hard braking) and speed violations. Common definitions of events would be helpful; this is discussed in the Working Group on Events and Incident Definition, which had a round table in Vienna as well. From a policy point of view events are better usable than TTC, increase of mean speed, etc. With regard to safety impact assessment, the expectations of policy makers have to be managed. Coming up with numbers of accidents, fatalities and injuries that can be prevented because of a certain ITS application is very hard and will not always be possible. In short the suggested changes for the FESTA handbook not so much, but check if the above mentioned methods to assess safety impacts are mentioned in the handbook, and add text on managing expectations (the latter is an issue not only for the safety impact assessment but for example also in scaling up, so it might be better to write a separate piece on it).

### Data issues

To explain effects, explanatory variables (such as surroundings) are very important. The most ideal case is to collect the following data: Video data (video processing takes a lot of time so this should be automated as much as possible), Questionnaires & travel diaries (at certain points during the test, e.g. on multimodal travelling to do mobility analyses – these should be as easy as possible to fill in, using predefined answers, checkboxes), Data on surroundings, Meta data (description of data and tests for evaluation, such as who drove the vehicle, which functions were studied in a particular test drive, circumstances when driving, etc.), and Audio data (e.g. to give test drivers the options to tell what happened and what their experiences are, to make it as easy as possible for them – voice memo). However, collecting all these data is costly and makes the analyses time-consuming. A possible solution is to collect in-depth data for part of the FOT. This was done in TeleFOT. When data needs are written down, including the way in which they will be measured, it is good to identify alternative

sources for data measurement and provide parallel back-up systems (possibly with lower accuracy), so there are fall-back options and the FOT does not rely on single data collection.

In short the suggested changes for the FESTA handbook in the data chapter stress the importance of explanatory variables (and explain the consequences for data collection), the solution to collect in-depth data for part of the FOT, and fall-back options for data collection.

### Scaling up

With scaling up we mean the translation of small scale traffic effects (e.g. for a city or region, or even a road stretch) to large scale societal benefits (e.g. for country or EU). For scaling up, the sample that was chosen for the FOT is very important. Getting a representative sample of the whole population (probability sampling, perfect sample) is impossible. However, it is okay to have an imperfect sample (non-probability sampling), as long as you know the limitations of your sample. When scaling up, keep it conservative but do not be afraid to draw conclusions. FESTA could help here by saying something on how imperfect the sample can be, and by clarifying the limitations of the study. At present scaling up is done in a direct (rough) way: for example in euroFOT this was done via an extrapolation of effects experienced on different road types (and traffic state – congestion vs. free flow, cars vs. trucks) to a yearly mileage driven on these road types in the EU. Can more be done? Policy makers want concrete statements, but it is difficult to meet their needs. A possible solution could be to keep it more as a 'discussive' analysis in terms of trends, and not to over quantify it.

In short the suggested changes for the FESTA handbook in the scaling up section write text on the sample and representativeness, and add guidance on limitations of the sample. Check if the euroFOT description of scaling up could be used in the handbook. And last, managing expectations (see safety conclusions above).

### Integration of results

The integration between impact areas (insights on usage, surroundings) are often missing, due to time constraints. Both euroFOT and TeleFOT have worked on a template for the harmonization of results. An example of such a template should be filled in so that the person filling in the template knows the level of detail that is expected. Ideally there are two versions available – one 'management' version for the main document and one detailed one for the annex with technical details etc. Analysts (including analysts well familiar with statistics) should be involved from the beginning of the project and work together with people collecting the data, setting up the tests, etc. For the experts it is important also to include insights discovered during the analysis, even if not always statistically confirmed.

In short the suggested changes for the FESTA handbook in the impact assessment section add information about the templates from euroFOT and TeleFOT and write about the integration of analyses.

### Debundling

With debundling we mean disentangling the effects of bundled functions (functions tested at the same time, together in the car or on the road). In debundling the analysts are dependent on the experimental set-up; analysts can only analyse what is tested. This means if a bundle

is tested, only the entity of the bundle can be analysed, and if one function of the bundle should be tested, it can be only analysed by conducting a separate test on the specific function.

In short the suggested changes for the FESTA handbook check if there is a debundling section, add euroFOT and TeleFOT experiences. Again add something about managing expectations and the limitations there are in debundling.

### Summary of the discussion

- There are challenges in explaining some of the effects that appear in the analysis. The question is whether this is dependent on the experimental design.
- Piloting of impact assessment is essential but often forgotten.
- Relation between observation and accident risk is still a big question mark. More basic research is needed.
- The FESTA methodology should give advice on how to take into account the bias that you put in the sample.
- Formalizing the results into harmonized tables might facilitate the comparison across FOTs.
- Smart de-bundling of effects of functions is still not solved.

### **3.2.7 Key statements from the Data Sharing round table**

The conclusions from this round table are as follows.

#### Collected data to share

Collected data to share are vehicle mounted sensors (eyetracker, lanetracker, headway, etc), V2V and V2I data including “activity” data, questionnaires- and interview data, enhancing data such as. road attributes and weather, video, GPS and different levels of data from the vehicles’ own network, so called Controller Area Network (CAN) data. IPR rights and legal and ethical rules are setting the context for different levels of sharing for different data type.

#### Guiding principles for data sharing

Guiding principles for data sharing are being discussed at the international level. Different implementations of data sharing, such as the Research Data Exchange (US) principles, need to be folded in.

There are different objectives in sharing such as research versus real time commercial applications, (for example Probe data Japan).

Incentives for sharing may be financial, to increase the amount of data and global diversity and to increase analysis of data and corresponding results.

Safeguards against misuse are needed, to create confidence and trust. Therefore there is a need for e.g. controlled access.

#### IPR, legal and ethical issues

There are several IPR, legal and ethical issues around data sharing that should be addressed. Considerations about Personally Identifiable Information (PII) should be addressed especially concerning video and GPS data. Truncating (anonymising) of data is a way to address issues, but the trade-off in value has to be considered. Early anonymising in data collection is needed for data security. There are different legal requirements internationally, where the most stringent should be applied. Common informed consent approach is needed for research projects, to enable future data sharing. The action identified was to set up a list of desired data and identify issues associated with each data item and propose solutions, for example for anonymising video data: “Keep the gaze, lose the face”

#### Common international data sharing platform

The recommendation is to use common data formatting standards where available, and develop new ones when needed.

Actions to be taken are: further clarification of the value of data sharing to reach a common understanding.

#### Main challenges in creating a common data sharing platform

In creating a data sharing platform different legal aspects need to be taken into account, interest by different regions need to be maintained and activities need to be synchronized.

For using the platform, resources for operations and maintenance are needed. Incentives for sharing should be identified and provided and the access and protections should be arranged.

The following actions are needed: Clarify the timing of related projects (RDE, FOT Net). Examine current collaboration activities. Examine European call for funding of solutions to the identified issues to create a common platform.

#### Summary of the discussion

- There is a massive amount of collected data: figure out how to share it.
- Clarify what the benefits of data sharing are.
- FOTs should not be about collecting data, it is about analysis.
- RDE in the US should be investigated for input to the common data sharing platform.
- IPR and legal issues are major points of concern, some solutions exist already, but the area needs more attention to facilitate efficient common analysis in the future.
- Use current funded activities and funding possibilities to shape a synchronised international initiative.

### **3.2.8 Key statements from the Event Definition round table**

#### The relationship between Events and Safety impact assessment

In NDS/FOT studies, a typical goal is to evaluate whether crash risk increases or decreases when a driver exhibits a certain behaviour (such as looking away from the road) or when a warning system is made available to the driver. This change in crash risk is often evaluated

by looking at whether the relative frequency of critical events goes up or down in correlation with the behaviour or presence of the safety system.

As real crashes typically are very rare events, even given the amount of data collected in larger scale FOT/NDS studies, the critical events are typically non-crash events, such as hard braking and/or rapid steering manoeuvres. Making a safety impact assessment based on these critical events can therefore be considered a leap of faith. Essentially, when using non-crash events to predict future crashes, you have to assume that the events you use as indicators are causally predictive of actual crash involvement.

### Defining Crash Relevant Events

The challenge for upcoming FOT/NDS studies is that currently, our knowledge on crash causation is not detailed enough to specify exactly which events are the right ones to select. Ideally, one would of course select and compare only true Crash Relevant Events (CREs), i.e. events of a type that is known to be predictive of actual crash involvement. In other words, those would be CREs for which it is legitimate to infer that a change in their relative frequency corresponds to a proportional change in crash risk.

Unfortunately, CRE definitions that fulfil this criterion have yet to be fully established. In published studies, explicit descriptions of the connection between the CREs used as indicators and actual crash risk are often lacking.

The key question to address when designing an NDS/FOT study meant to explore safety impacts is therefore: how can we establish the relation between crash relevant events and different types of crashes? Are the underlying causation mechanisms the same for the CREs studied as for the crashes of interest? And if there is an actual relationship, is it proportional or is there some other transfer function?

### Driver Response Based CREs

Crash relevant events can be identified by the responses of the driver, by the driving context, or by the driving history.

The general idea of driver response based identification is that drivers prefer to travel in comfort and generally will not expose themselves to kinematically drastic manoeuvres unless necessary. Abrupt velocity and direction changes in vehicle or in driver are thus considered to be out of the ordinary, indicating an unplanned and urgent response to an unexpected situation. Identification can take place by looking for either momentary or sustained threshold breaches in kinematics or other parameters. Looking for momentary threshold breaches might capture many false positives, since kinematic signals may be noisy or have peaks within normal operation. To remedy, one can opt to identify events through sustained rather than momentary threshold breaches.

### Driving Context Based CREs

Driving context based identification looks at the vehicle and/traffic environment configurations. The idea is that for certain vehicle and road configurations, the available safety margins are so small that it takes very little to crash. In other words, too small margins equal elevated crash risk, and prevention of whatever it is that leads to these small margins will enhance traffic safety. The definition of what constitutes small margins can be either

static (e.g. lane markers) or dynamic (various types of threat assessment, such as high range rate changes within a given range).

In FOTs, a natural approach is to use the function itself to detect CREs. For example, if an FOT assesses the effects of FCW, the warnings issued can be used as event identifiers. This means you do not have to worry about function availability and usage (the function can only do something when on and available). The downside is that any CREs occurring outside the function's detection capacity or when the system is turned off will not make the CRE list. It makes it difficult to estimate the frequency of conflicts which the function needs to detect but can't.

### Driving History Based CREs

Driving history based identification looks for unusual events in a driving history perspective. The idea is that unusual events in a person's driving history are unusual precisely because the driver tries to avoid such events. Hence they represent situations which the driver is unwilling to enter, and therefore at least a certain portion of them should relate to unsafe situations. For example, if a person almost never brakes harder than 0.6 G, then instances of braking above 0.6 G might represent situations where that individual almost lost control, even if 0.6 G would be considered moderately hard braking by most other drivers.

### What do these different types of CRE's represent?

In the driver response based approach, CREs are identified based on how each driver evaluates the situation. One driver may brake hard at a certain time-to-collision threshold, another driver might not, and the CRE selection will consequently include the first event but not the second. Driver response based CRE selection will thus reflect the normal variability in any driver population in terms of driving style, risk perception and willingness/capacity to respond.

In a contextual approach, CREs are identified independently of driver response. All drivers are thus equally covered, independently of their capacity or willingness to respond. Some drivers with a more kinematically aggressive driving style may still be overrepresented. However, if you believe that small margins in and of themselves are predictive of crash involvement, then it does not matter that some drivers contribute with more CREs than others (since by logical extension, these drivers really have a relatively higher crash risk).

In the driving history approach one can tailor CRE selection to individuals, i.e. while 0.7 G might be a normal deceleration level for one driver, another might never go above 0.65 regardless of the situation. If a 0.65 G deceleration occurs only once in the latter person's full driving history, one might draw the conclusion that it was a special event for that driver and hence warrants further examination. A prerequisite for the driving history based approach is that basic driver behaviour is fairly stable. If it's not, the search algorithm will find numerous situations due to inherent variability in the data rather than because the driving situations as such have special, crash relevant, properties. Hence this approach might be more applicable for professional drivers who show less variability in their driving over time, rather than for lay people whose driving is much more varied.

### Removing false positives

Since there are no perfect CRE identifiers, any event search in a NDS/FOT database is likely to come up with a mix of true positives (i.e. actually crash relevant events) and false positives, i.e. events, which while captured by the search algorithm, turn out not to be coupled to the proposed accident causation mechanism after all. An example would be a search algorithm that identifies hard braking events, but which cannot in and of itself distinguish if there is a braking lead vehicle in front or not.

Therefore, after a set of what could be called CRE candidates have been identified in any NDS/FOT data set, comes the very important step of weeding out the false positives from the true positives. There are essentially three ways to do this; manual (visual) inspection, filtering based on some threshold logic, or a combination.

In manual visual inspection, researchers review each event based on the video recorded and other available data, and then decide whether the event is truly crash relevant or not. One advantage is that variables that might be impossible to capture numerically can be weighed in, such as how startled or scared the driver seems to be. On the other hand, assessing a level of criticality from comparatively low resolution videos is often difficult; video is not reality after all. The assessment will vary between researchers. Inter-rater reliability thus becomes an important factor. Given that a reliability round 80 % is considered a good number in inter-rater reliability studies, one in five events is potentially misclassified. Statistics used in the final analysis have to compensate for that (if possible).

In conditional filtering, the initial group of CREs is screened based on whether the CREs fulfil certain additional criteria. An example: for lane departures, in addition to leaving the vehicle crossing the lane marker, one might remove all CRE candidates where the driver did not respond to the situation by steering or braking within three seconds. If the driver fails to respond the situation is not critical (unless there is a subsequent crash).

Conditional filtering and manual visual inspection may be combined. The search for CREs can also be iterative. Fitch et al. (2008) screened a large initial pool of CRE candidates using one new filter at a time. After each filtering, a visual inspection of randomly sampled events from the remaining CRE candidates was carried out. The process continued until the desired ratio between true and false positives was achieved.

It is not obvious which of these approaches is the best. What is clear is that they may lead to different results. Fitch et al. (2008) compared their results with those of another project (Hanowski et al, 2008) that applied a kinematic threshold plus visual manual CRE candidate selection on the same data set. While both projects found hundreds of what they judged to be relevant CREs, only 7 of the 596 CREs found by Hanowski et al (2008) overlapped with those from Fitch et al (2008).

### Summary of the discussion

Any NDS/FOT study needs to think hard about how to define their Crash Relevant Events. Moreover, CRE definitions are moving targets. If an event definition is to survive over time, the thing measured needs to stay relatively invariant. However, behaviours in the driving population do change over time, as do crash types and causation mechanisms.

Furthermore, it is probably not necessary to ever achieve global, general CRE definitions. It is likely more appropriate to tailor one's CRE definitions so they become practically useful,

given analysis resources, data collection quality and resolution, etc. Cross project differences may stem as much from sensor capacity and data collection differences as from theoretical disagreements. Thus, project goal completion should beat the desire for general CRE definitions.

When defining CREs, it is important to recognize that event definitions based on single measures are unlikely to succeed, driving and drivers are more complex than that. On the other hand, sophisticated analysis tools and methods can probably be imported from other domains. There is no need to reinvent these wheels for traffic safety.

There is also the issue of whether the scope needs to be broadened. Current CRE definitions are usually very driver/vehicle centred. However, Vehicle-To-Infrastructure definitions might need to be added in certain projects. Also, it may be time for a new chapter in the FESTA handbook: COMPLIANCE, how to understand what is required to make people use/respond to system information in a good way.

### 3.2.9 List of participants

**Table 11 List of participants 5<sup>th</sup> international workshop**

Organisation	Last Name	First Name	Country	RT 1	RT 2	RT 3	RT 4
Aalborg University	Namaki Araghi	Bahar	Denmark		x		
ADAS_Management. Consulting	Hagleitner	Walter	Austria	x			
ANDATA GmbH	Kuhn	Andreas	Austria	x			
Autotoll	Chan	Don	Hong Kong		x		
Chalmers	Franzen	Stig	Sweden		x		
Chalmers University of Technology	Dozza	Marco	Sweden	x			
CTAG	Blanco	Rosa	Spain			x	
DENSO AUTOMOTIVE Deutschland GmbH	Suzuki	Noriyoshi	Germany		x		
ERTICO - ITS Europe	Fernandez	Laetitia	Belgium				x
ERTICO - ITS Europe	Flament	Maxime	Belgium			x	
ERTICO - ITS Europe	Silva	Irina	Belgium	x			
European Commission - DG CONNECT	Höfs	Wolfgang	Belgium			x	
FIA	Simcic	Gabriel	Belgium				x
IFSTTAR	Saint Pierre	Guillaume	France		x		
IKA	Benmimoun	Mohamed	Germany	x			
IKA	Zlocki	Adrian	Germany	x			
i-Transport Lab. Co., Ltd.	Horiguchi	Ryota	Japan		x		
ITRI	Li	Michael	Taiwan		x		
ITS Australia	Harris	Susan	Australia			x	
Japan Automobile Research Institute	Ito	Hiroshi	Japan			x	
JSAE	Nakayama	Masafumi	Japan	x			
Loughborough University	Reed	Steven	UK	x			

<b>Loughborough University</b>	Welsh	Ruth	UK	x
<b>Ministry of Internal Affairs and Communications, Japan</b>	Mizui	Kenta	Japan	x
<b>Ministry of Internal Affairs and Communications, Japan</b>	Tanuma	Tomoyuki	Japan	x
<b>Nagasaki Prefectural Government / Univ. of Tokyo</b>	Suzuki	Takahiro	Japan	x
<b>National Institute for Land and Infrastructure Management</b>	Suzuki	Shoichi	Japan	x
<b>NICTA</b>	Geers	Glenn	Australia	x
<b>NICTA</b>	Taib	Ronnie	Australia	x
<b>PIT</b>	Vincent	Benoit	Canada	x
<b>PTV</b>	Benz	Thomas	Germany	x
<b>RAMBOLL</b>	Lumiahho	Aki	Finland	x
<b>Renault</b>	Barbier	Cécile	France	x
<b>RWS</b>	Alkim	Tom	Netherlands	x
<b>SAFER</b>	Gellerman	Helena	Sweden	x
<b>Society of Automotive Engineers of Japan, INC.(JSAE)</b>	Sakai	Yasunari	Japan	x
<b>Swarco Mizar</b>	Franco	Gino	Italy	x
<b>TNO</b>	de Kievit	Martijn	Netherlands	x
<b>TNO</b>	Jonkers	Eline	Netherlands	x
<b>TNO</b>	Malone	Kerry	Netherlands	x
<b>TOYOTA Motor Corporation</b>	Morita	Hiroshi	Japan	x
<b>Transport Canada</b>	Battista	Vittoria	Canada	x
<b>TRANSVER GmbH</b>	Fakler	Oliver	Germany	x
<b>UMTRI</b>	Bezzina	Debby	US	x
<b>UMTRI</b>	LeBlanc	David	US	x
<b>UMTRI</b>	Sayer	James	US	x
<b>University of Leeds</b>	Barnard	Yvonne	UK	x
<b>US DOT</b>	Schagrin	Mike	US	x
<b>Volvo Cars</b>	Grönvall	John-Fredrik	Sweden	x
<b>Volvo Cars</b>	Ljung Aust	Mikael	Sweden	x
<b>VTT</b>	Zulkarnain	Zulkarnain	Finland	x

Number of participants	51
USA/ Canada	6
Japan /Hong Kong/ Taiwan	11
Australia	3
Europe	31

### 3.3 6th International Workshop

[http://www.fot-net.eu/en/networking/international\\_workshops/fot-net\\_6th\\_international\\_workshop.htm](http://www.fot-net.eu/en/networking/international_workshops/fot-net_6th_international_workshop.htm)

#### 3.3.1 Agenda

<b>Round Tables</b>	08:00	<b>Breakfast and registrations</b>
	08:30	<b>FOT-Net Round Tables</b>
		<p><b>RT1 - Data and Impact analysis, Chairpersons: Adrian Zlocki, IKA, and Martijn de Kievit, TNO</b></p> <p><b>RT2 - Strategies for deployment and satisfying stakeholders' needs, Chairpersons: Tom Alkim, RWS, and Yvonne Barnard, ERTICO –ITS Europe</b></p> <p><b>RT3 - Sharing of driver data from FOTs and Naturalistic Driving Studies, Chairperson: Helena Gellerman, SAFER</b></p> <p><b>RT4 - Sharing of cooperative systems data, Chairperson: Maxime Flament, ERTICO – ITS Europe</b></p>
	12:00	<b>Lunch</b>
<b>Plenary Session</b>	13:00	<p><b>Welcome: FOT Network platform activities: update and meeting objectives</b></p> <p>Yvonne Barnard, Project Manager, ERTICO – ITS Europe</p>
	13:15	<p><b>Welcome from the Regions: Introduction on FOT activities</b></p> <p>Europe, US, Japan</p>
	13:45	<p><b>Recommendations from the Parallel Round Tables:</b></p> <p>Recommendations and future action items on Data and Impact analysis, Chairpersons: Adrian Zlocki, IKA, and Martijn de Kievit, TNO</p> <p>Recommendations and future action items on Strategies for deployment and satisfying stakeholders' needs, Chairpersons: Tom Alkim, RWS, and Yvonne Barnard, ERTICO –ITS Europe</p>
	14:15	Coffee break
	14:30	<p><b>Recommendations from the Parallel Round Tables (cont.):</b></p> <p>Recommendations and future action items on Sharing of driver data from FOTs and Naturalistic Driving Studies, Chairperson: Helena Gellerman, SAFER</p> <p>Recommendations and future action items Sharing of cooperative systems data, Chairperson: Maxime Flament, ERTICO – ITS Europe</p>
	15:00	<p><b>Conclusions and relevant FOT presentations during the Congress</b></p> <p>Yvonne Barnard, ERTICO – ITS Europe</p>
	15:30	<b>Adjourn</b>
	16:00	<b>Opening Ceremony ITS World Congress</b>

### 3.3.2 Introduction

The theme of the FOT-Net Workshop was '*Impact and deployment of Field Operational Test (FOT) results and data*'. General objectives of this workshop included reinforcing the global FOT network in order to exchange knowledge and best practices, fostering cooperation for FOT activities as well as supporting the coherent development and implementation of FOTs at European and international level.

Experts from different regions discussed four topics: *Data and Impact analysis, Strategies for deployment and satisfying stakeholders' needs, Sharing of driver data from FOTs and Naturalistic Driving Studies, and the Sharing of cooperative systems data*. Representatives from Europe, North-America, and Asia-Pacific reported on the developments in their region.

*Data analysis* focussed on the methodological and practical issues surrounding the data and impact analysis of systems in FOTs. This session addressed methods and tools for analysis as well as how to set up the data and impact analysis before the real-world test takes place, so that the right data are measured. The section *Strategies for deployment and satisfying stakeholders' needs* concluded that it is important that road operators start to make their information. If you want to go to deployment the message is: keep it simple, start pragmatic, just a few services at a time. The session *Sharing of driver data from FOTs and Naturalistic Driving Studies* focussed on facilitating global common research taking into account both the views of the data providers and the data researchers. It also addressed questions on sharing driver data on a global level, requirements on the organisations for storing/analyzing data and stakeholders' contributions. Participants also discussed how and by whom driver data will be collected in the future and how that will affect the data sharing. *Sharing of cooperative systems data* focused on data used in cooperative systems (CS), discussing international cooperation and cooperative system data as a candidate for the "killer application" in CS. The session also covered the tools for dealing with the huge amount of this data and the questions who will benefit from sharing this data and who will own this data. One of the conclusions of the day was the strong focus on deployment. Some systems and services are already deployed, for others the road is still long and paved with many technical, organisational and business obstacles. But the need to improve safety and services also creates opportunities. The international workshop contributed to countries and regions learning from each other and the formation of new partnerships.

60 people attended the workshop from all continents. Their feedback in the evaluation was very positive.

More information and the presentations and report can be found at: [http://www.fot-net.eu/en/networking/international\\_workshops/fot-net\\_6th\\_international\\_workshop.htm](http://www.fot-net.eu/en/networking/international_workshops/fot-net_6th_international_workshop.htm)

### 3.3.3 Round table 1: Data analysis and impact analysis

Chairs: Adrian Zlocki, IKA, and Martijn de Kievit, TNO (replacing Eline Jonkers, TNO)

10 participants, 5 from Europe, 3 from Japan, 2 from US.

Panellists:

- Hiroshi Morita (Toyota IT&ITS Planning Div.)
- Takashi Sueki (Toyota IT&ITS Planning Div.)
- Mohamed Benmimoun (Institut für Kraftfahrzeuge (IKA))
- Dave Leblanc (University of Michigan Transportation Research Institute (UMTRI)),

This round table discussed the methodological and practical issues surrounding the data and impact analysis of systems in FOTs. Methods and tools for analysis were discussed, but also how to set up the data and impact analysis before the real-world test takes place, so that the right data are measured. The following topics were handled during the round table:

#### 1. Piloting

It is important that piloting is not just technical piloting, but that the whole data flow and processing is tested. This includes also the impact assessment. Feedback loops are necessary so that flaws in the data chain that are noticed during piloting, can be corrected and tested again. The duration of the piloting phase is dependent on the FOT context and needs to be foreseen in the planning stage.

#### 2. Data collection for explaining effects

To explain effects that are observed during a FOT, explanatory variables (e.g. surroundings) are very important. To collect these data, appropriate measurement systems have to be used, for example CAN data or video. However, collecting these in-depth data for the whole FOT is costly and time-consuming. A possible solution can be to collect in-depth data for part of the FOT. The right tools for data collection need to be selected.

#### 3. Issues and topics of data analysis

For effective data analysis it is important to focus on research questions and resulting data requirements at the planning stage of an FOT. The type of data and the amount of data is to be selected in advanced depending on the analysis methods and tools. Alternative data sources need to be taken into account in order to provide parallel back-up systems.

#### 4. Methods for scaling up

Scaling up is the translation of small scale traffic effects to large scale societal benefits. At present scaling up is usually done in a direct (rough) way; via an extrapolation of effects experienced on different road types to a yearly mileage driven on these road types in the EU. The availability of external data is a problem. Are other methods possible for scaling up? Or how to deal with the lack of data?

### Introduction

After an introduction from Adrian Zlocki (IKA) on FOT-Net, the main goal of the round table was introduced: to discuss methodological issues – surround the data and impact analysis of systems in FOT's. The results from this round table will form input for the FOT-Net Working Groups on Data Analysis and Impact Assessment and Scaling Up. In the European methodology – FESTA V model – data analysis is on the right hand side in the scheme from the data analysis upwards. Update of FESTA handbook will be performed including the findings of this workshop.

## Piloting

Piloting is very important, but the experience shows that it is never planned this way. If it comes to the critical work, piloting not always has the importance that it needs. Ideally one would have the piloting when everything is ready (e.g. defined what measurements you want to use after planning, etc). It is necessary to test everything that is going to be used within the FOT. Piloting takes a lot of time, everything needs to be tested, for example 6 months in euroFOT was not long enough.

It is recommended to fix a moment, after which the methodology to be used in the FOT cannot be changed anymore.

One needs to keep in mind that long term effects cannot be measured. The selected drivers for the pilot will also not be the same as the user group for the FOT. Pilot data should not be interpreted as real FOT data.

Documentation of the context in which the data was collected is an important aspect here.

Three kinds of piloting can be distinguished:

- Using driving simulators
- Testing of the complete system – one or two monitors to check if the system is working
- Performing the piloting stage in a closed environment – such as a test track or traffic safety training centre. After this stage one can go to the public road.

There seems to be a big difference between Europe/US and Japan. In Japan one generally do not perform piloting, but try to use a system directly, as people unusually have a very short product life time, and quickly replace systems.

In the US most safety pilots are funded by the NHTSA (government), people have a lot of influence on how these are conducted. Data will be governmentally owned, and data can also be shared amongst others.

Recommendations:

- Pilot at least 6 months
- Do not change methodology / tools / data sets after piloting

## Data collection for explaining effects

In Europe research questions are usually coming from stakeholders. The questions will be answered by different people in the FOT.

In cooperative FOTs multiple devices are used, each device has an own ID and logs their messages, synchronization over GPS time etc., this is always problematic in analysis, for example high accuracy (within 90 ns) for synchronization is required, but time stamps between vehicle and infrastructure might be off up to 4 sec.

A lot of data are collected in FOTs – different sets of data are collected. Some issues with video are the synchronization of data from CAN and Video, and the usability of the video data. For the future the detection of the relevant situations for the follow-up analysis need to be automated.

#### Recommendations:

- Provided detailed definitions on time synchronization
- Provide detailed definitions on localization (especially on cooperative FOT)

#### Data analysis

Critical questions on data analysis are: How do you make sure that you do good data analysis, how do you make sure that you make the data work. Do you analysis before you have the data? Depending on the amount/type of data?

At some point one needs to start with the data analysis. The data is not always automatically provided to the people that do the analysis. Data acquisition systems may come from the OEM's, and data located at the server of the manufacturer. Getting the data takes some time. It is recommended to take a first snippet of data and to use this data to the first analysis. It should be made sure that it can be convert/read, formatted etc. and used for analysis. If several manufacturers are involved, the link to the specific manufacturers needs to be deleted. Standardization is important in this aspect; several other processing tasks are happening, additional information needs to be used.

Data analysis processes and analysts need to be involved in the rest of the project.

Many stakeholders may be involved in these projects, both public and private. In Europe it is tried to have a large set of stakeholders in the project, when doing the analysis.

From this fact the question on what are the research questions that are wanted to be analyze in the project arises? Very general questions can often not be answered in the analysis. In the end research questions sometimes need to be adapted to the data available. Adaptations during projects are common – the vision in the beginning is very promising, but based on reality this is adapted during the cause of the project changing the general research questions to be more and more specific. Results need to be found in a common solution between the stakeholders and project funders.

#### Recommendations:

- Introduction of automated data analysis is necessary and is currently in research
- Long term experience is necessary

#### Scaling up

For scaling up the question is how to get away from FOT's and get results for the real world. Feeding into simulations is a start. Modelling is necessary to adjust to different conditions. For example traffic density is an issue that should be taken into account. Explanatory variables and how they differ from place to place need to be known and then quantified for different regions. Then one also needs to know which variables matter for your scaling up. There are methods for scaling up, but it is a risky process. Even when vehicle technology is similar and independent of location, driving styles and infrastructure (intersections) may be quite different from one place to another.

For scaling up confidence in relevant parameters must be available, but it is not always easy to find these parameters. Scaling up is not always possible, for example in euroFOT too many assumptions needed to be made – therefore no scaling up was done.

For warning systems scaling up this not easy, but for automation the answer needs to be much more accurate as with automated systems you take over driving tasks.

Scaling up different may be different for private companies than for public institution in terms of goals and methods– for example companies want the results for expanding their business opportunities.

Recommendations:

- Use FOT data to feed simulations, there is a need for simulation models and simulation parameters for overall scale up region
- Don't do it, if you do not have all necessary information!

### **3.3.4 Round Table 2: Strategies for deployment and satisfying stakeholders' needs**

**Chairpersons: Tom Alkim, RWS and Yvonne Barnard, ERTICO – ITS Europe**

23 participants: 11 from Europe, 3 from US, 6 from Asia/Pacific, 3 from Iran

Panellists:

- Jim Wright (AASHTO deployment Group)
- Frans op de Beek (Rijkswaterstaat)
- Whoi-Bin Chung (ITS Korea)
- Susan Harris (CEO ITS Australia)

In this round table we explored the do's and don'ts of deployment. How can you go from a successful FOT towards deployment and how can stakeholder needs be addressed? We learned from various experts around the world and shared our expertise and experience in this interactive round table session. Theory as well as hands on experience from initiatives such as The Safety Pilot, Cooperative ITS Corridor, Smart Highway Project and ITS Spot Services were discussed. The main topics of this round session were:

1. **Stakeholder needs:** What are the needs of FOT stakeholders in your region?
2. **From FOT to deployment:** From your experience, what are the necessary steps to go from a FOT to successful deployment of systems and services?
3. **Public Private Partnership:** How can public and private partners agree on joint deployment strategies according to you?
4. **Deployment Do's and Don'ts:** What do you perceive to be the main obstacle(s) to successful deployment and what can be the main driver?

#### **Next steps from FOT to deployment**

The question is: How can public and private partners agree on joint deployment strategies according to you?

This question is difficult to answer, the spectrum ranges from “this is not going to happen because it's too complex” to “the public wants it, so it's coming”.

A clear statement was made and agreed that if you want to go to deployment you have to keep it simple. Start pragmatic, just a few services at a time. Evolution, not revolution, is the way forward.

After a successful FOT don't go for another project (projects have an end date) but start deployment initiatives. By forcing things to roll out, you have to deal with issues, not waiting until you have figured it all out (have all the standards available, etc.).

However, certification and evaluation are some of the important issues that need to be addressed in order to deploy systems.

Cloud based services may enable full deployment of cooperative services. It is important that road operators start to make their information available (road side based, traffic, traffic management, etc).

Safety and security issues are a serious potential threat/delay for deployment.

There are several initiatives in deploying cooperative systems, for example Korea starts with a large pre-deployment project in 2014, the Netherlands, Germany and Austria are starting with a deployment initiative the coming three years (Cooperative ITS Corridor).

For the deployment discussion it is important to make a distinction between safety related services and information based services, they require different sets of requirements, conditions, boundaries, approaches, etc. For example, localized immediate warning service has to be short range. In FOTs you should try to be as technology agnostic as possible, but of course for deployment you have to make a decision (short range, long range or both).

### **Public Private Partnership**

On the question of how public and private partners can work together in deployment there were more questions than answers in this discussion, particularly on:

- the ownership of the data (OEM, driver, other stakeholders?)
- who has authority in which domain, especially in new domains (new roles that didn't exist before, such as responsibility for overall architecture)
- how is the distribution of costs and benefits, who invests where (which domain(s)) and who will reap what rewards (from which domain(s))?
- the highways and cities pose different forms of complexity, how to deal with it?

### **Deployment drivers and obstacles**

Here it was again easy to focus on reasons not to do something while it is more important to focus on reasons to do something.

Deployment drivers:

- road charging will be a main driver especially if it drives interoperability between regions and with value added services
- policy related drivers are; safety (vision zero), cost savings (e.g. maintenance costs), traffic flow improvements, and comfort (providing a smooth ride)
- there has to be a first mover, an initiator

- the limitation of current instruments is also a driver to pursue new instruments/approaches to overcome these limitations in order to reach policy goals
- the concept of the "killer application": the driving service that makes everyone want to have and to invest in

Deployment obstacles:

- lack of business models and uncertainty in the (distribution of) costs
- data ownership issues
- (new) roles are not clear enough
- there's not enough motivation for stakeholders (it's easier to keep doing what you're doing and don't change...)
- certification needs to be organized, not clear how this will be done
- security issues

### **General remarks from the session**

The group was small enough to have good discussions and have everyone involved but still diverse enough to have different opinions from different regions.

Even though usually this kind of discussion on how to actually go to deployment is dominated by reasons not to do it, the main theme in this session was that you should find reasons to do it (rather than not to) and in order to do so keep it pragmatic, as simple as possible, with a limited number of partners and with a strong focus. Meanwhile a process has to be organized to expand later (in terms of services, regions and stakeholders) as well as to improve standardization (use what is available and find practical/pragmatic solutions for what is not available (yet) and feed back the knowledge and experience that you gain from this process into the standardization process) and similar/analogous fields.

### ***3.3.5 Round Table 3: Sharing of driver data from FOTs and Naturalistic Driving Studies***

**Chairperson: Helena Gellerman, SAFER**

10 participants: 3 from Europe, 2 from US, 5 from Asia/Pacific

Panellists:

- Wolfgang Hoefs, EC
- Jim Sayer, UMTRI
- Sami Koskinen, VTT
- Kazuya Takeda, Nagoya University
- Raksincharoensak Pongsathorn, Tokyo University of Agriculture and Technology (TUAT)

Large scale FOT/NDS datasets has deepened the knowledge about how drivers normally behave in traffic and why crashes occur. The objective driver data has been collected through video, eye trackers and the vehicles internal data. Collecting the data is costly and researchers around the world are discussing the means to reuse the globally collected datasets. In this session we will listen to the perspective on driver data sharing from

stakeholders from different parts of the world. This information formed the basis for a discussion on how we can facilitate global common research, taking into account both the views of the data providers and the data researchers.

Questions:

- How could we share driver data including video on a global level?
- What are the requirements on the organisations storing/analyzing the driver data?
- How could different stakeholders contribute to facilitate driver data sharing?
- How and by whom will driver data be collected in the future and how will that affect the data sharing?

For each question recommendations were formulated and actions proposed.

### **How could we share driver data including video on a global level?**

Recommendations:

- Convey the cost of maintaining and supporting data use to funding organisations nationally/internationally.
- Develop standards for data description; review today's standards and build on them.
- Faces on video changed to avatar faces; standard for face "descriptions".
- Consent for sharing the video and GPS (PID data) to other organisations, also globally; possible in all countries? Use for research possibilities? Problem for "open" access?
- Ethics problem with re-use of data in some countries, investigate how to re-use that data? Internationally accepted standard maybe is the answer.
- Investigate methods of data sharing used in other areas; Political and Social research; speech research data sharing; medical research data.

Actions:

- Investigate the economy of re-using the data instead of collecting more data.
- Investigate anonymising the data, also what would be lost in translation.
- Investigate how we control/open access to different details of the data.

### **What are the requirements on the organisations storing/analyzing the driver data?**

Recommendations:

- Documentation set from the beginning; facilitated by sharing plans and actual outcome/updated plans.
- Contracts with each analysis site; publish only anonymised data; depends on the separate project agreements.
- A "standard requirements" to follow and address in agreements.
- Long term agreement for storage; depending on the interest of the data; Interest will decay.

Actions:

- Establish a consortium on how to do this; not an international standardisation body for now; more de facto standard.
- Funding for storing the data has to be identified.

### **How could different stakeholders contribute to facilitate driver data sharing?**

Recommendations:

- Sharing of data plans, user agreements, and participant agreements.
- Data collector should provide that data to the community; investigate the obstacles of future collectors to provide data.
- OEMs' CAN data is very interesting; identify a minimum set. "J1839" may be a standard for a minimum set of CAN signals?
- Funding schemes are necessary to facilitate data sharing.

Actions:

- Identify the minimum subset of CAN signals that could support transport research.

### **How and by whom will driver data be collected in the future and how will that affect the data sharing?**

Recommendations:

- Engage the stakeholders (major representatives) in discussions on how to share future data.
- Show analysis done to make stakeholders aware what the research could do for future data owners.
- Data sharing system should be useful for both providers and analysts.

Actions:

- Identify the future stakeholders; such as city authorities, service providers, road authorities, Google, insurance companies, FOT researchers of the future.

### **3.3.6 Round Table 4: Sharing of cooperative systems data**

**Chairperson: Maxime Flament, ERTICO – ITS Europe**

10 participants: 5 from Europe, 1 from US, 4 from Asia/Pacific

Panellists:

- Shoichi Suzuki (National Institute for Land and Infrastructure Management, MLIT)
- Wolfgang Hoefs (EC)
- Stuart Ballingall (Austroads)
- Dave Leblanc (University of Michigan Transportation Research Institute (UMTRI))

Questions:

1. How can we contribute to international cooperation on sharing cooperative system data?
2. Is cooperative system data the killer application in itself?

3. What are the tools that will be put in place when dealing with the huge amount of this data?
4. Who will benefit from sharing this data?
5. Who will own this data?

In this round table experiences on probe data from the US, Japan and Europe were presented, as well as the collaboration on this issue between the three regions. The newly established iMobility Forum working group on probe data was introduced.

Conclusions from the discussion were the following:

- Probe Data can be a powerful tool for public authorities in the near future leading to substantial ITS infrastructure savings.
- The iMobility Probe Data Working Group wants to clarify this potential by bringing current actors with the PA.
- V2V/V2I data probing is seen as a game changer; US and Japan have done the first steps planning the use of this data.

### **3.3.7 Plenary session**

In the afternoon a plenary session was held, with in total 60 participants.

The session started with a welcome from the regions:

- Japan: Shoichi Suzuki (Ministry of Land, Infrastructure, Transport and Tourism Japan)
- Europe: Wolfgang Hoefs (European Commission)
- US: Jim Sayer (UMTRI), who took over from Dale Thompson (US DoT), who was not able to join the meeting.

Next the chairs from the four round tables presented their conclusions. For a description see the chapters on the round tables above.

Yvonne Barnard (ERTICO – ITS Europe) concluded the session with a summary of the main conclusions.

The workshop showed that we are well on the way to deployment: of intelligent transport systems, of results from FOTs, of data gathered in FOTs and from vehicles and infrastructure, and last but not least of knowledge and experiences gained in FOTs. Some systems and services are already deployed, for others the road is still long. Many obstacles to deployment were discussed, but also many opportunities were identified. Obstacles may be technical, organisational and business related, and solutions for overcoming these obstacles were discussed in the round tables. Opportunities are often based on the need that is expressed by many stakeholders to improve safety and services for travellers. Countries and regions are learning from each others' experiences and new partnerships are forming. Sharing of data and sharing of experiences is key for the future success of our work. She invited all participants to stay in touch and to subscribe to the FOT-Net newsletter and to visit the FOT-Net website and the wiki ([www.fot-net.eu](http://www.fot-net.eu)).

Finally she thanked all panellists and participants, our Japanese hosts and the Dutch embassy for their support in the organisation.

### 3.3.8 List of participants

Table 12 List of participants 6<sup>th</sup> international workshop

Organisation	Last name	First name	Country	RT 1	RT 2	RT 3	RT 4
AASHTO	Wright	James	US		x		
ACECR	Hamze	Kooras	Iran		x		
ACECR	Rostami	Habib	Iran		x		
ACECR	Yousefi	Saleh	Iran		x		
Alpine Electronics	Onishi	Hirofumi	US			x	
Australian Road Research Board	Faber	Freek	Australia		x		
Austroroads	Ballingall	Stuart	Australia				X
Bishop Consulting	Bishop	Richard	US		x		
City of Tampere	Kulmala	Mika	Finland		x		
City of Tampere	Mika	Kulmala	Finland		x		
DENSO	Atanassow	Boris	Germany		x		
DENSO International Europe	Leinmueller	Tim	Germany		x		
Electric Mobility	Sorassen	Runar	Norway				X
ERTICO -ITS Europe	Barnard	Yvonne	Belgium		x		
ERTICO -ITS Europe	Flament	Maxime	Belgium				X
European Commission - DG CONNECT	Hoefs	Wolfgang	Belgium			x	
Finnish Meteorological Institute	Nurmi	Perti	Finland	x			
Honda	Bay	Sue	Japan		x		
Industrial Technology Research Institute	Tseng	Huei-Ru	Taiwan		x		
Institut für Kraftfahrzeuge, RWTH Aachen	Benmimoun	Mohamed	Germany	x			
Institut für Kraftfahrzeuge, RWTH Aachen University	Fahrenkrog	Felix	Germany	x			
Institut für Kraftfahrzeuge, RWTH Aachen University	Zlocki	Adrian	Germany	x			
Intelligent Transport Systems Australia	Harris	Susan	Australia		x		
ITS Korea	Chung	Whoi-Bin	Korea		x		
ITS Korea	Jo	Soon-Gee	Korea				
ITS Korea	Lee	Jin-Kee	Korea				
Japan Automobile Research Inst.	Suzuki	Hiroyoshi	Japan		x		
Japan Automobile Research	Ito	Hiroshi	Japan			x	

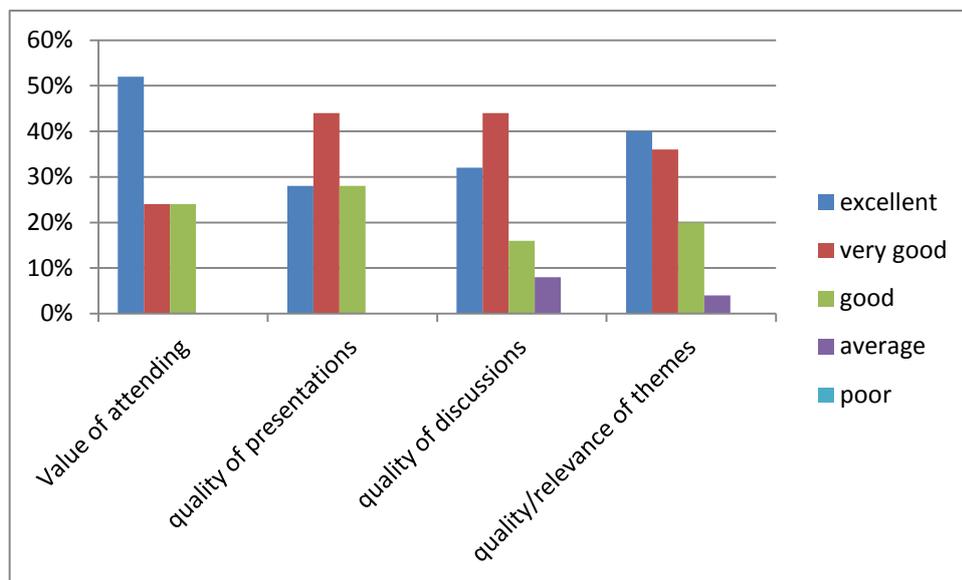
<b>Institute</b>					
<b>Japan Automobile Research Institute</b>	Uchida	Nobuyuki	Japan		x
<b>JDRMA</b>	Shibata	Jun	Japan		
<b>Keio University</b>	Kawashima	Hironao	Japan		
<b>Korea Expressway Corporation</b>	Kwon	Chul	Korea		
<b>MEDDE/TRANSPORT</b>	Pagny	Roger	France		X
<b>Mobisoft Oy</b>	Eloranta	Pekka	Finland		X
<b>Nagoya University</b>	Takeda	Kazuya	Japan		x
<b>National Institute for Land and Infrastructure Management, MLIT</b>	Suzuki	Shoichi	Japan		X
<b>NEC Europe Ltd.</b>	Baldessari	Roberto	Germany		x
<b>NetPort Science Park</b>	Clemetson	Per Ola	Sweden		x
<b>NetPort Science Park</b>	Fastén	Gunnar	Sweden		x
<b>NICA</b>	Geers	Glen	Australia		X
<b>NICTA</b>	Taib	Ronnie	Australia		x
<b>Rijkswaterstaat</b>	Van Loon	Jos	Netherlands		X
<b>RWS</b>	Alkim	Tom	Netherlands		x
<b>RWS</b>	Opde Beek	Frans	Netherlands		x
<b>SAFER</b>	Gellerman	Helena	Sweden		x
<b>TNO</b>	De Kievit	Martijn	Netherlands	x	
<b>Tokyo University of Agriculture and Technology</b>	Raksincharo ensak	Pongsathorn	Japan		x
<b>Toyota</b>	Morita	Hiroshi	Japan	x	
<b>Toyota</b>	Sueki	Takashi	Japan	x	
<b>TOYOTA Motor Corporation</b>	Kakihara	Masaki	Japan		x
<b>TransCore</b>	Rausch	Robert	US	x	
<b>Transcore</b>	Schnacke	Dick	US		
<b>TTRI</b>	Ando	Ryosuke	Japan	x	
<b>UMTRI</b>	Leblanc	David	US	x	
<b>UMTRI</b>	Sayer	Jim	US		x
<b>University of California PATH Program</b>	Shladover	Steven	US		X
<b>VTT</b>	Koskinen	Sami	Finland		x
<b>Ygomi, LLC</b>	Shields	T. Russell	US		x
<b>Ygomi, LLC</b>	Gomi	Yuka	US		X

Number of participants 59

USA/ Canada 10

Japan /Hong Kong/ Taiwan/Korea	18
Australia	5
Europe	23
Iran	3

### 3.3.9 Feedback



**Figure 6 Feedback 6<sup>th</sup> international workshop**

In total, 25 feedback forms were returned.

## 4 Other workshops and events

Next to stakeholders and international workshops, FOT-Net organised seminars and webinars in WP 3 and 4. The FOT-Net seminars are reported in D4.2 and workshops and webinars on FESTA and the working groups in D3.2.

FOT-Net participated in a variety of events and workshops and FOT events, giving presentations and disseminating FOT-Net materials. Below is a list of the main events.

**Table 13 List of other workshops and events**

Date	Event	Place	Description and link
04-05/04/2011	FP7 ICT for Transport Concertation Meeting	Brussels	FOT-Net led the concertation session on FOTs
13-14/04/2011	FOTsis Kick off meeting	Madrid	FOT-Net presentation
15/05/2011	Dutch Automotive week	Helmond	Networking & Dissemination
17-18/05/2011	INTERSAFE2 Final event	Worlfsburg	Networking & Dissemination
17-19/05/2011	FIA Eurocouncil event	Estoril	FOT-Net presentation to all European Automobile clubs at FIA Eurocouncil event
19-20/05/2011	FOT-Net support to FOTsis	Lisbon	Support FOTsis in what regards FESTA
25/05/2011	CoCarX final event	Dusseldorf	Networking & Dissemination
08/06/2011	Special session European ITS Congress	Lyon	Presenting the preliminary results of the FESTA revision and the expert working groups <a href="http://www.fot-net.eu/en/news_events/events/past_fot_events/fot-net_special_session_at_its_european_congress_2011.htm">http://www.fot-net.eu/en/news_events/events/past_fot_events/fot-net_special_session_at_its_european_congress_2011.htm</a>
22/06/2011	Prologue final event	Vienna	FOT-Net presentation <a href="http://www.prologue-eu.eu/prologue/final-workshop">http://www.prologue-eu.eu/prologue/final-workshop</a>
15/10/2011	International Task Force on Vehicle-Highway Automation 15h Annual Meeting	Orlando	Annual meeting
20/10/2011	Special Session on FOTs: moving ahead towards ITS deployment	Orlando	Special Session at the ITS World Congress
21/10/2011	COMeSafety Workshop	Orlando	7th International Workshop on Vehicle Communications for Safety and Sustainability

23/04/201	TRA 2012	Athens	Presentation on "FOTs in Europe" & Presence at EC stand
14/05/2012	FOT-Net meeting with CIP Evaluation WG	Brussels	Introduction to FOT-Net activities
15/05/2012	EU-Japan cooperation workshop on ITS	Tokyo	Presentation on "FOTs in Europe"
23/05/2012	EUCAR Integrated Safety Program Board	Brussels	Report on FOT-Net activities
25/10/2012	Special session on Cooperative ITS Field Operational Tests in Europe	Vienna	Special session on Cooperative ITS Field Operational Tests in Europe, International ITS World Congress <a href="http://www.fot-net.eu/en/news_events/events/past_fot_events/special_session_cooperative_systems_at_its_world_congress_.htm">http://www.fot-net.eu/en/news_events/events/past_fot_events/special_session_cooperative_systems_at_its_world_congress_.htm</a>
06/11/2012	EUCAR Conference	Brussels	EUCAR Conference
27-28/11/2012	TeleFOT final event	Brussels	Final event, presentation by FOT-Net and involvement in panel
29-30/11/2012	Annual Polis Conference	Perugia	Annual conference, distribution of FOT-Net material
09-03-2013	FOTSis club	Brussels	Dissemination of FOT-Net material
16/04/2013	iMobility Forum: ICT for Transport Concertation Workshop, eCoMove, ECOSTAND, Amitran & COMeSafety2	Brussels	FOT-Net presentation
23/05/2013	FOT-Net –COMeSafety Joint Workshop	Torino	Workshop on deployment of cooperative systems, related to WP6, report to be found in D6.2 and at: <a href="http://www.fot-net.eu/en/news_events/events/past_fot_events/fot-net_comesafety_joint_workshop_cooperative_its_deployment.htm">http://www.fot-net.eu/en/news_events/events/past_fot_events/fot-net_comesafety_joint_workshop_cooperative_its_deployment.htm</a>
05-06-2013	Special session at European ITS Congress, jointly with UDRIVE	Dublin	Special session on Synergy between naturalistic driving studies and field operational tests <a href="http://www.fot-net.eu/en/news_events/events/past_fot_events/its_european_congress_2013.htm">http://www.fot-net.eu/en/news_events/events/past_fot_events/its_european_congress_2013.htm</a>
06/06/2013	Contribution to Special session at European ITS Congress on Raising awareness of ICT systems for efficient and sustainable mobility to its stakeholders and end	Dublin	FOT-Net presentation

	users		
12-13/06/2013	DRIVEC2X event	Gothenburg	FOT-Net dissemination <a href="http://www.fot-net.eu/en/news_events/events/past_fot_events/making_cooperative_systems_cooperate.htm">http://www.fot-net.eu/en/news_events/events/past_fot_events/making_cooperative_systems_cooperate.htm</a>
03/09/2013	International workshop on Naturalistic Cycling Analysis	Gothenburg	FOT-Net dissemination
23-26/09/2013	Fast Zero Symposium	Nagoya	Presentation from FOT-Net Data sharing working group
24/09/2013	SCORE@F final event	Versailles	FOT-Net presentation
15/10/2013	Special session at ITS World Congress	Tokyo	Theme: Analysing the outcomes of Field Operational Tests <a href="http://www.fot-net.eu/en/news_events/events/past_fot_events/its_world_congress_tokyo_special_session_on_analysing_the_outcomes_of_fots.htm">http://www.fot-net.eu/en/news_events/events/past_fot_events/its_world_congress_tokyo_special_session_on_analysing_the_outcomes_of_fots.htm</a>
4-5/11/2013	FESTA workshop	Torino	Revision of the FESTA handbook
4-5/12/2013	Polis annual conference	Brussels	Dissemination of FOT-Net material

## 5 Literature study on probe data

In the frame of the collaboration between the US, Japan and Europe on probe data, the Commission has requested iMobility Support and FOT-Net for a contribution. FOT-Net commissioned the study after an open tender and an evaluation of the proposals to FTW (FTW Forschungszentrum Telekommunikation Wien GmbH). The Literature Study on the State of the Art of Probe Data Systems in Europe by Sandford Bessler and Thomas Paulin (FTW) was submitted to the Commission on 13 September 2013. It may be found at: [http://www.fot-net.eu/download/fcd-report\\_final.pdf](http://www.fot-net.eu/download/fcd-report_final.pdf).

This work has been realised in the framework of the iMobility Support and FOT-Net Projects. The report will support the new founded iMobility Support Probe Data Working Group in scanning the relevant research findings, experiences and deployment results, obtained both by EU funded projects and national/regional initiatives, identifying the stakeholders, probe data applications, standardization status and the open issues and challenges.

The executive summary of this report is as follows:

The two major goals of Intelligent Transportation Systems are the reduction of the number of fatalities and injuries on the roads, and the reduction of traffic jam hours. The latter goal would also contribute to reducing the environmental impact of transport. Probe (vehicle) data (PVD) plays an increasing role for contributing to these top priorities of our society. In earlier works also called floating car data (FCD) this information stems mainly from sensors and contains at least position information, but may also include vehicle traction information, driver actions (steering, braking), weather and road surface conditions, etc. Based on published references, the present study investigates the state of the art in the PVD technology, the EU-and nationally funded projects, commercial products and systems, as well as available websites with realtime traffic information and tools. This work has been realised in the framework of the iMobility Support and FOT-Net Projects. Its purpose is to support the new founded iMobility Support Probe Data Working Group in scanning the relevant research findings, experiences and deployment results, report on the standardization status and the probe data applications, identifying the stakeholders and the open issues and challenges.

The massive development of mobile phone and applications in the last few years, which went hand in hand with the apparition of performant mobile navigation systems and with good cellular connectivity, caused that traffic information became ubiquitously available. The driver is much better informed on the realtime traffic, most cities and regions in Europe operate web sites and map applications showing realtime traffic on the roads, a part of it being obtained from Probe data.

A short analysis of the stakeholders shows that, besides large internet service providers, map and navigation tool providers, the road operators and OEM have an important role and responsibility to provide safety and level of service on the roads. They would use probe data to manage the traffic, to maintain the road (pavement) and to monitor and alert users in hot spots, where the danger of accidents accumulates. A number of system approaches to PVD are shortly discussed, and the main standardization works are reviewed in the report. Whereas internet companies enter into massive deployment of GPS-based probe data collection, which is today a mature

technology, the road and service operators put their hopes in the deployment of cooperative-ITS services, with the probe vehicle data being one of them.

Technically, there are still some challenges we could identify through scanning the relevant publications: when all vehicles will be equipped with PVD collecting technology, a more flexible approach than "collect always and everywhere" might be desirable, to reduce the costs of transmitting, processing and storing non-relevant data. It would allow a fast sampling of the sensors for certain applications, where higher spatial accuracy is required. Another challenge is the privacy protection of probe data, since it might disclose the detailed user mobility pattern and driving behaviour. In particular mobile phone applications do not address sufficiently the privacy issues.

The probe data collection and aggregation of many vehicle traces into confident data enables the application and service providers to develop a large variety of functions for traffic information, management and control (e.g. alternate routing), for road maintenance in extreme weather cases, for monitoring the fuel consumption and emissions, for speed monitoring and speed limit setting, for identification of dangerous traffic spots, or for quick identification of incidents and traffic disruptions.

Since road operators and car makers plan to introduce the probe data service as soon as 2015, this report could be used by the Probe Data Working Group as a starting point to evaluate the adopted PVD solution for cooperative-ITS in Europe.

## 6 Conclusions

### 6.1 FOT Network

During the six years of the FOT-Net 1 and FOT-Net 2 projects, a community has been built of people who are either involved in FOTs themselves or are stakeholders who have an interest in the results of FOTs. The stakeholder meetings and international workshops provided good opportunities to both exchange the ideas developed in FOT-Net and in the wider community and also, to discuss and generate new ideas and insights.

The results of the activities were fed back to the wider community in several ways: via the meetings and in the meeting reports; in the presentations that were put at the FOT-Net website and via the working groups and seminars that produced new knowledge which was fed into an update of the FESTA methodology.

The networking activities were a continuation of the work in FOT-Net 1, and took on-board the lessons-learned and recommendations formulated in FOT-Net 1 Deliverable D2.2 (Common Roll-out plan to support coherent development and implementation of FOTs) and D2.3 (Reports on FOT Stakeholder Meetings and International Workshops).

The network has continued to grow and feedback from participants shows that it will remain valued mechanism for sharing best practice going forwards.

### 6.2 Stakeholders workshops

Six stakeholders workshops were organised as well as a final event at the end of the project (which was extended for three months with the approval of the Commission). Each workshop was organised around a specific topic. Usually each workshop started with a report of the different activities of the FOT-Net work packages, such as progress of the working groups and the stakeholders analysis. Speakers from different stakeholder groups discussed the specific workshop theme from their perspective. Panel discussions and discussions with the audience were held in order to get a better view on the different interests and opinions of stakeholders. The workshop was always concluded with an overview of the future FOT-Net activities and events in order to promote future opportunities for participants to engage.

The fifth workshop focussed on deployment roadmaps and on the question of how FOTs can be used to reach policy goals.

The sixth workshop continued the focus on what can be done with the results of FOTs by addressing the issue of Exploitation of FOT results. Expectations from different types of stakeholders were presented, both from different types of organisations (industry, policy makers) and projects (the major European projects).

The seventh workshop was a bit different, it was not a FOT-Net stakeholders meeting but a Coordination Day from the EC DG INFSO for cooperative systems FOTs, for which FOT-Net provided support. Here, the focus was on different aspects of cooperative system FOTs such as standards and interoperability, data sharing, dissemination, deployment and international collaboration.

The eighth workshop addressed a new type of FOT, the Pilot projects on cooperative systems. Again issues such as interoperability, data sharing and deployment were addressed.

The ninth workshop focussed on a specific type of ITS: Speed Alert. This workshop took place in conjunction with the European ITS Congress in Dublin. It was organised in collaboration with ADASIS and TN-ITS. Speed systems in different forms have been studied for quite a long time and this workshop brought together the results and discussed the perspectives.

The tenth workshop addressed Naturalistic Driving Studies (NDS), which is also one of the target studies of FOT-Net and which have been incorporated in FESTA. This workshop was organised in collaboration with the UDRIVE project. Studies in the US and Europe were discussed as well as NDS for different types of vehicle. Deployment of the results of NDS was also a major theme.

The final event of FOT-Net was an extra event, agreed in the last amendment of the Description of Work, in which the project received an extension of 3 months. This event looked back at both FOT-Net and FOTs and discussed the deployment of results and the legacy of FOT-Net. Deployment of results was discussed. Representatives from academia, public and private sector were involved in looked forward to future challenges and opportunities. Finally the FOT-Net work and the network were handed over to the new support action: FOT-Net Data. The first workshop of this project took place the next day.

### **6.3 International workshops**

Three international workshops were organised on the days of the opening of the ITS World Congresses. The workshops took the form of four round tables in the morning, in which experts discussed specific topics, and in which the audience could participate, and a plenary session in the afternoon in which representatives from the three regions (Europe, US and Asia-Pacific) updated the audience on the FOT developments in their region and the convenors of the round tables presented their conclusions. In all workshops, the FOT-Net activities were also summarised.

The five working groups of FOT-Net (WP3), the FOT Tools work package (WP5) and the Stakeholders analysis work package (WP6) were actively involved in the organisation of the round tables, and often used these events to gather information and ideas for their work as well as presenting their ideas to international experts. In all round tables, experts from different regions were involved.

The fourth international workshop, in Orlando, focussed on Cooperative system FOTs, Naturalistic Driving Studies, deployment actions and tools for FOTs.

The fifth workshop, in Vienna, addressed the themes of four working groups: data analysis, impact assessment and scaling up, data sharing (especially in the context of cooperative systems) and event and incident definition.

The sixth workshop, in Tokyo, combined the data analysis and impact assessment issues in one round table. Strategies for deployment and stakeholder needs was another theme. Two

types of data sharing were discussed in the other two round tables: driver data gathered in FOTs and NDS, and Data coming from cooperative systems.

## **6.4 Selection and evolution of topics**

The topics discussed at the stakeholder's and international workshops were selected for several reasons. Themes related to systems and driver behaviour were already identified in FOT-Net 1 deliverable D2.2, namely cooperative systems, Intelligent Speed Adaptation (or Speed Alert) and Naturalistic Driving Studies. Other themes were derived from the five FOT-Net working groups (data analysis, event and incident definition, ethical and legal issues, impact assessment and scaling up, and data sharing) or the work packages on FOT tools and Stakeholder analysis. Themes were discussed and decided upon during the consortium meetings and thus also selected by what was seen to be current and relevant in the FOT community. Finally, care was taken that all meetings were of interest to the main stakeholder groups (public sector, industry, research and user organisations).

The main focuses which were addressed across workshops were:

- Cooperative systems FOTs, as in this period the large European projects (DRIVEC2X and FOTsis) as well as many national and international ones were testing this type of system, while in the FOT-Net 1 period, the emphasis was more on in-vehicle driver assistance systems. Cooperative systems FOTs are more complex, and involve a greater number and wider range of different types of stakeholders.
- The new pilot projects were targeted; these projects are closer to deployment and thus very interesting from the point of view of many stakeholders.
- Naturalistic driving studies gained momentum, with the start of the European UDRIVE project and the advancement of the US SHRP2 project.
- Deployment and exploitation of FOTs. These topics were addressed in all workshops, as the final goal of FOTs is to have an impact in the real world, for policies and market. As FOTs are now an instrument that has been used for a longer time period, it was possible to discuss these topics in an increasingly detailed way, based on a more wide-spread experience.
- Data sharing. This topic gained momentum over the years, as the awareness grew that FOTs gather huge amounts of data that are not always fully analysed and used in the projects and may contain a wealth of information if properly exploited. At the same time, there are still many obstacles for data sharing and re-use. The next FOT-Net support action, FOT-Net Data, was developed to address these issues.

## **6.5 Collaboration with other projects**

FOT-Net collaborated with many other projects in organising the workshops. First of all the major European FOT and NDS projects contributed to the workshops and provided speakers and participants. Both the older projects (euroFOT and TeleFOT) and the newer ones (DRIVEC2X, FOTsis and UDRIVE) contributed in most of the workshops. Also the pilot projects got their own place (like Co-Cities, Compass4D, ICT4EVU, FREILOT, MOBINET, MOLECULES, smartCEM). Some workshops were organised together with other projects.

Collaboration also took place in other ways, like the common workshop with COMeSafety on the deployment (in WP6) and in the seminars of WP4. There was regular collaboration with iMobility Support, on the probe data studies, in their working groups and events and in dissemination activities. Importantly, collaboration was also promoted between participants at events who continued to work together 'off-line' outside of these programmed events.

## **6.6 Identification of speakers, participants and recruitment for events**

When the themes of a workshop were determined speakers from different stakeholder groups were identified and approached. As well as taking into account subject matter expertise, care was taken to ensure that speakers came from different stakeholder groups, projects and countries. Each event was announced on the FOT-Net website and newsflashes and mailing lists were used to attend the FOT community to the event. Also dissemination channels of other projects and the FOT partners and associated partners were used. The international workshops were listed in the ITS Congress programme. Participants could register on-line at the website.

In the reports presented in the chapters above, the participant lists are given with some basic statistics. The lists are not always completely accurate, because at the last minute, some people did not attend or other people arrived who had not registered. Participants were asked about their organisation and country of origin. They were also asked about which FOTs or projects they participated in, but they often did not provide this information, or mentioned a variety of projects (since as many organisations are involved in several projects). The question was sometimes also difficult to answer as organisations may be involved in a FOT but the individual did not necessarily play an active role in this. Consequently, it is too difficult to draw conclusions about FOT participants.

In the sections of the stakeholder workshops, the categories of the organisations of the participants were counted. Five categories were distinguished: Associations/User groups/European Commission, Industry, Universities/research organisations, Road operators/public authorities and Other/unknown. For the international workshops the region of the organisation where the participant is working is given.

In total, over the seven stakeholders workshops held, there were 257 participants (including speakers), with an average of 37 participants per workshop. There was a good mix from the different stakeholder groups. The percentage of women is not very large, less than 30%, reflecting the gender inequality in the sector.

**Table 14 Participants stakeholders workshops per gender and organisation**

Total number of participants	257	100%
Number of women – men	74 – 183	29% - 71%
Associations/User groups/European Commission	78	30%
Industry	59	23%
Universities/research organisations	69	27%
Road operators/public authorities	34	13%
Other/unknown	17	7%

As participants could attend more than one meeting we also looked at the individuals.

**Table 15 Individual participants stakeholders workshops per gender and organisation**

Total number of individual participants	185
Percentage of women – men	25% - 75%
Number of individual organisations	117

Participants work in a variety of countries. FOT-Net2 did not manage to attract people from Eastern-European countries, this also reflects the fact that not many organisations in these countries are involved in FOTs.

**Table 16 Countries of individual participants**

Total number individual participants	185
Belgium	27%
Netherlands	17%
Germany	11%
France	9%
Spain	8%
Sweden	7%
UK	7%
Austria	3%
Denmark	3%
Finland	2%
Japan	2%
Norway	2%
USA	2%
Italy	1%
Ireland	1%
Switzerland	1%

A total of 141 persons participated in the three international workshops (48 on average). The division over the regions is given below. Half of the participants came from outside Europe, thus making these workshops truly international.

**Table 17 Participants international workshops per region**

Total number of participants	141
USA/ Canada	15%
Asia/Pacific	33%
Europe	53%

## 6.7 Feedback

In most of the workshops participants were given feedback forms with the following questions:

	excellent	good	very good	average	poor
<b>Value of attending</b>	<input type="checkbox"/>				
<b>Quality of presentations</b>	<input type="checkbox"/>				
<b>Quality of discussions</b>	<input type="checkbox"/>				
<b>Quality / Relevance of themes</b>	<input type="checkbox"/>				

**Figure 7 Feedback questions**

It was not easy to collect forms, as people sometimes left the sessions early or were not inclined to fill in evaluation forms. So the number of forms returned is relatively small. The feedback was predominantly positive. The category “poor” was never used and the category “average” never exceeded the 8%. This judgement was usually reserved for the quality of discussion, on which we have the least influence. So for all questions the large majority deemed the quality and value good to excellent.

## 6.8 Conclusions and use of results

The stakeholder’s and international workshops were community-building events that were well-appreciated by participants and served as inspiration for the work that is being done in the FOTs and for decisions that stakeholders have to make with the implementation and deployment of Intelligent Transport Systems. The results from the meetings were fed back to WP3 on the revision of the FESTA methodology. The reports from the FOT-Net working groups and the FOT-Net work packages 5 and 6 reflect the ideas discussed during the workshops. The latest revision of the FESTA handbook (2014) is partly based on the experiences exchanged in the workshops.

The strong emphasis on deployment and exploitation during the workshops demonstrates that the community is willing and prepared to move from research to real-life implementation.

The scope of the interest in FOT activities has become broader, in terms of systems to be tested, types of projects and types of stakeholders. During the meetings, familiar faces were seen of experts who have been involved in the field for a long time, but also new ones, like PhD students, people recently employed, and participants from stakeholder organisations that have only become involved recently. The international collaboration has been strengthened, especially with the US and Japan, but also with other countries.

The issue of the sharing of data from FOTs became more and more of interest to stakeholders. The follow-up of FOT-Net2, the FOT-Net Data support action that started on 1 January 2014 is also the result of this interest. FOT-Net Data will continue the networking activities of FOT-Net. It will continue with the website and the wiki, as well as with the maintenance and promotion of the FESTA methodology. All information gathered in FOT-Net, such as the reports and presentations of the workshops will remain available for the FOT community. Stakeholder meetings and international workshops will be organised, and information about FOT experiences exchanged. The emphasis will be more on the data sharing and data re-using issues, but networking will continue to be at the core of the activities.

## References

FOT-Net 1 Deliverables:

D2.2 – Common roll-out plan to support coherent development and implementation of FOTs

D2.3 – Reports on FOT Stakeholder Meetings and International Workshops

Available at: <http://www.fot-net.eu/en/library/deliverables/deliverables.htm>

## List of Tables

Table 1 List of Stakeholders workshops.....	12
Table 2 List of participants 5 <sup>th</sup> stakeholders workshop .....	21
Table 3 List of participants 6 <sup>th</sup> stakeholders workshop .....	33
Table 4 List of participants 7 <sup>th</sup> stakeholders workshop .....	45
Table 5 List of participants 8 <sup>th</sup> stakeholders workshop .....	57
Table 6 List of participants 9 <sup>th</sup> stakeholders workshop .....	68
Table 7 List of participants 10 <sup>th</sup> stakeholders workshop.....	80
Table 8 List of participants final event .....	90
Table 9 List of International workshops.....	92
Table 10 List of participants 4 <sup>th</sup> international workshop .....	102
Table 11 List of participants 5 <sup>th</sup> international workshop .....	119
Table 12 List of participants 6 <sup>th</sup> international workshop .....	132
Table 13 List of other workshops and events .....	135
Table 14 Participants stakeholders workshops per gender and organisation .....	144
Table 15 Individual participants stakeholders workshops per gender and organisation .....	144
Table 16 Countries of individual participants .....	144
Table 17 Participants international workshops per region .....	145

## List of Figures

Figure 1 Feedback 5 <sup>th</sup> Stakeholders workshop .....	23
Figure 2 Feedback 8 <sup>th</sup> stakeholders workshop .....	59
Figure 3 Feedback 9 <sup>th</sup> stakeholders workshop .....	69
Figure 4 Feedback 10 <sup>th</sup> stakeholders workshop.....	81
Figure 5 Feedback final event.....	91
Figure 6 Feedback 6 <sup>th</sup> international workshop .....	134
Figure 7 Feedback questions .....	145

## List of abbreviations

ACC	Advanced Cruise Control
FCW	Forward Collision Warning
FESTA	Field opErational teSt support Action
FOT	Field Operational Test
ITS	Intelligent Transportation System
ND	Nomadic Device
NDS	Naturalistic Driving Studies
OEM	Original Equipment Manufacturer
RQ	Research Question
WG	Working Group
WP	WorkPackage