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Promotion



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1 Agenda

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

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

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.

Panelists:

- Hiroshi Morita (Toyota IT&ITS Planning Div.), [download presentation](#)
- Takashi Sueki (Toyota IT&ITS Planning Div.)
- Mohamed Benmimoun (Institut für Kraftfahrzeuge (IKA)) [download presentation](#)
- Dave Leblanc (University of Michigan Transportation Research Institute (UMTRI)), [download presentation](#)

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?

3.1 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.

3.2 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 is 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 center. 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

3.3 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)

3.4 *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

3.5 *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. Modeling 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!

4 Round Table 2: Strategies for deployment and satisfying stakeholders' needs

Chairpersons: Tom Alkim, RWS (tom.alkim@rws.nl), and Yvonne Barnard, ERTICO – ITS Europe (y.barnard@mail.ertico.com)

23 participants: 11 from Europe, 3 from US, 6 from Asia/Pacific, 3 from Iran

Panellists:

- Jim Wright (AASHTO deployment Group) [download presentation](#)
- Frans op de Beek (Rijkswaterstaat) [download presentation](#)
- Whoi-Bin Chung (ITS Korea) [download presentation](#)
- Susan Harris (CEO ITS Australia) [download presentation](#)

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?

4.1 *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).

4.2 *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?

4.3 *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

4.4 *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.

5 **Round Table 3: Sharing of driver data from FOTs and Naturalistic Driving Studies**

Chairperson: Helena Gellerman, SAFER (helena.gellerman@chalmers.se)

10 participants: 3 from Europe, 2 from US, 5 from Asia/Pacific

Panellists:

- Wolfgang Hoefs, EC [download presentation](#)
- Jim Sayer, UMTRI [download presentation](#)

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- Sami Koskinen, VTT [download presentation](#)
- Kazuya Takeda, Nagoya University [download presentation](#)
- Raksincharoensak Pongsathorn, Tokyo University of Agriculture and Technology (TUAT) [download presentation](#)

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.

5.1 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 controll/open access to different details of the data.

5.2 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.

5.3 *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.

5.4 *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.

6 Round Table 4: Sharing of cooperative systems data

Chairperson: Maxime Flament, ERTICO – ITS Europe (m.flament@mail.ertico.com)

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))

Presentations to be downloaded:

- [US-Japan Collaboration on Probe Data](#)
- [iMobility Probe data Workgroup](#)
- [US ITS Connected Vehicle Program: Data Collection and Sharing Opportunities](#)
- [ITS spots Japan](#)

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.

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).

Finally she thanked all panellist and participants, our Japanese hosts and the Dutch embassy for their support in the organisation.

8 Participants list

Round table 1, RT1 - Data and Impact analysis

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Round Table 2, Strategies for deployment and satisfying stakeholders' needs

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RT3, Sharing of driver data from FOTs and Naturalistic Driving Studies

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