



FIELD OPERATIONAL TESTS

From research question
towards deployment



About FOT_{NET}

Since January 2011, the second edition of the FOT-Net project has gathered European and international stakeholders in a strategic networking platform to present results of Field Operational Tests (FOTs), identify and discuss common working items and promote a common approach for FOTs - the FESTA methodology.

Why have a common approach? With one approach to the same type of projects, it is easier to share results, share collected data, have a common language and through a common methodology it is also possible to combine and compare FOTs.

Services have included a bi-annual newsletter; stakeholders meetings gathering European players interested in FOTs to share information, results and developments of European and national trials, international workshops, a series of in-depth seminars to promote the use of a common FOT methodology and address specific issues arising when organising a FOT; and an online catalogue of FOTs, which serves as a reference for all FOT organisers.

This final brochure highlights the outcome of the FOT-Net project and serves as an inspiration and guidance for people who would get involved with FOTs.

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For more information, visit www.fot-net.eu or contact info@fot-net.eu

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Field Operational Tests

– on the edge of deployment

Field Operational Tests (FOTs) are large-scale testing programmes aiming at a comprehensive assessment of the efficiency, quality, robustness and acceptance of ICT solutions used for smarter, safer, cleaner, and more comfortable transport solutions, such as navigation and traffic information, and advanced driver assistance. This includes stand-alone in-car systems as well as cooperative systems. FOTs are a step towards the market deployment of mature systems that have proven their functional effectiveness in validation tests with a limited number of test drivers and often on closed test tracks.

FOTs can currently be structured according to the main type of applications tested:

- ADAS – Advanced Driver Assistance Systems (Autonomous Systems)
- ISA – Intelligent Speed Adaptation
- Cooperative (Vehicle-Infrastructure) Systems

In addition, we find a number of so called **Naturalistic Driving Studies** that aim at collecting data on driver behaviour in the natural, real-world setting in order to better understand the relation between driver behaviour and traffic situation. Such data allow for example for better analysis of causes for crashes, thus supporting the development and evaluation of countermeasures, e.g. in the form of ADAS.

Over the last decades, a large number of ICT-based transport applications for a cleaner, safer and more comfortable mobility have been successfully developed and demonstrated in research projects throughout Europe. Scenario-based studies have indicated the potential societal benefits of the applications in terms of increased traffic safety, reduced environmental impact and better traffic flow, and have discussed the cost-benefit aspects.

For many applications, in particular in the field of Advanced Driver Assistance Systems (ADAS) and Intelligent Speed Adaptation systems (ISA), the studies suggest reasonable safety gains at a justified cost-benefit ratio.

This explains why expectations of many stakeholders towards the systems are high. However, what is not taken into account in this kind of studies is – amongst others – whether ordinary drivers will react on the support systems

in the intended way, whether they will accept the support and under which traffic conditions they will use the system. These factors might significantly influence the real-life safety potential of the systems.

Therefore, such assumptions on safety benefits need to be confirmed by data gathered in real-life situations with ordinary drivers. Field Operational Tests (FOT) is the instrument to collect such data.

FOTs also have the potential to address another issue: that despite recognised benefits the market penetration of many safety systems still is rather low. FOTs that involve the relevant stakeholders for deployment (e.g. road operators, fleet managers) and raise public awareness – with political decision makers and the general public – can significantly contribute to a faster market take-up of effective safety systems.

This brochure takes you through various steps of implementing FOTs based on the knowledge gathered within the FOT-Net projects. As a crucial start, a short introduction to the FESTA methodology will give an overview of the different steps for implementing FOTs and even take you a step towards deployment of the results.

Learn more

Several resources to learn more about FOTs have been created:

FOT-Net website: www.fot-net.eu

FOT Wiki: <http://wiki.fot-net.eu>

The FESTA Handbook is also available here.

FESTA Methodology

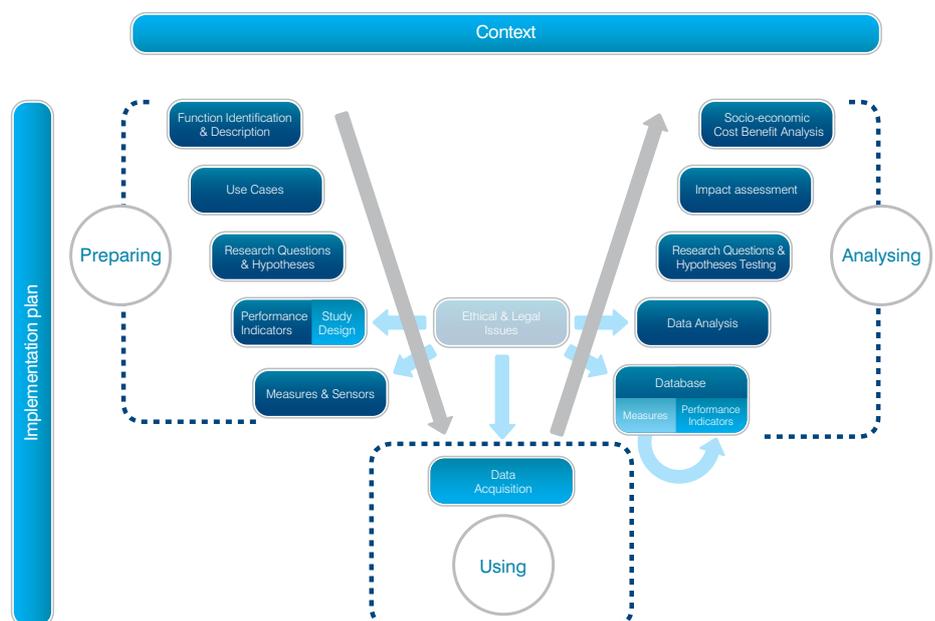
Consolidation and promotion of a common FOT methodology

To improve significance, comparability and transferability of available FOT results at the national and European level, a common European FOT methodology has been developed. The FESTA project funded by the European Commission developed a handbook on FOT methodology which gives general guidance on organisational issues, methodology and procedures, data acquisition and storage, and evaluation. As part of the FOT-Net project, the FESTA Methodology has been revised.

The FESTA V

The FESTA V depicts the FOT Chain that covers the steps that need to be carried out during a FOT. The horizontal bar on top of the diagram summarises the context in which the FOT is supposed to take place. The large arrows that form the “V” indicate the process line. The first steps which include setting up a goal for the study and selecting a suitable research team, and also the last steps that include an overall analysis of the systems and functions tested and the socioeconomic impact assessment, deal with the more general aspects of a FOT and with aggregation of the results. The further down the steps are located on the FESTA V, the more they focus on aspects with a high level of detail, such as which performance indicators to choose, or how to store the data in a database. Ethical and legal issues have the strongest impact on these detailed aspects, where the actual contact with the participants and the data handling takes place. The representation of the FESTA methodology in the form of a V does not mean that designing and performing a FOT is always a linear process. Decisions made at a certain stage of the FESTA-V influence the proceeding steps and it is inevitable to revise previous steps. Especially in the left-hand side of the V iteration may be necessary.

During the FOTNet activities, experts involved in current FOTs provided feedback and raised several issues and problems in relation to the use of the FESTA methodology. As FESTA should be seen as a living methodology, FOT-Net has gathered these inputs and introduced them in a revised handbook (revision 5) issued in January 2014.



How to involve stakeholders in and around your FOT

In the planning an implementation phase of a FOT, there are several stakeholders that play a role, for example interest groups, regions, where tests are conducted and policy makers interested in the results of the FOT. These stakeholders have to be involved in some way in order to support the deployment results. This can vary from simply informing them about the project to really involving them in the project. Before defining their role and organising them around the FOT, the stakeholders have to be identified and mapped.

To do this, a stakeholder analysis can be undertaken before the start of the FOT. A stakeholder analysis is not a concrete tool that can be filled in, but an analysis to do yourself, based on a number of questions. Questions that serve as a guideline for carrying out a stakeholder analysis are the following:

Who are the stakeholders?

Make a list of who the stakeholders are. Questions that can help making this list are: Who pays? Who has benefits? Who has impact on market success? Who has a role in implementation? Who has a role in organisation? Who might experience negative side-effects? Examples of stakeholders are public authorities, road operators, car manufacturers, automotive suppliers, insurance companies, telecom industry, service providers, transport companies, shippers, automobile clubs and the general public, etc.

How to classify the stakeholders?

The levels that you use can differ, depending on the goal of the project. In general three levels of stakeholders can be identified: (1) Stakeholders with a large impact on the market penetration of systems, such as car manufacturers (2) Stakeholders which guarantee a proper implementation and operation of systems, such as system developers, service providers, and in case of systems that need infrastructure: road operators and authorities and (3) Stakeholders who are not necessarily needed to provide functioning systems such as user clubs.

What are the stakeholders' interests?

Some stakeholders, for example car manufacturers, want to have proof of positive safety impact of systems, and research institutes want to have scientifically justifiable results. After the stakeholders' interests are defined, it can be deduced whether there are stakeholders that have conflicting interests, and whether there are stakeholders with interests that are in conflict with the project goals.

What influence do the stakeholders have?

For example car manufacturers providing the systems to be tested can increase the credibility of the project results, so they can have a large influence on the project, as well as on the implementation. Research institutes carrying out the analysis have a large influence on the project, but are not necessary for implementation and deployment.

How to address differences in interest and influence?

Possible roles for stakeholders are: partner in the project, member of the advisory board or steering committee, unofficial contact or sounding board (before results are final or public).

Within a stakeholder group differences can manifest themselves. Develop good contacts with the partners and stakeholders, and take a proactive role in addressing issues openly. Remember that a FOT is a means to an end, not the end in itself.





How to use the media

In the final stage of a FOT, media and communication can be used to get your message across. Part of the image people have is based on what they recently saw, heard or read in the media. With the right communication you can show the FOT results and prove impact.

Which factors make news 'NEWS'?

- **Current / topical** – It just happened
- **Out of the ordinary** – Changes in familiar patterns attract attention
- **Ongoing interest** – Adding opinion or facts to subjects already in the news
- **Authority** – Authority adds weight to a message and attracts audience
- **Close to home** – Local news and personal subject
- **First** – Knowing things before another
- **Conflict** – A good fight draws an audience
- **Size** – Size matters
- **(Audio)visual** – A picture tells a thousand words

Both internal and external target groups should be reached. For the internal target groups, activities can be conferences or symposiums with high-level speakers, and time for knowledge sharing. For the external target groups, focus can be on road safety, congestion and fuel economy that relates to the society and to daily life. For both groups visualisation is important, for example with real cars, systems or animations.

While being in contact with the media it is important to choose a good time, a good venue (attractive and easy to reach), to distribute audio visual material, and start plugging media early and tell them what to expect: preparation and creative thinking must start long ahead. It is essential to create a budget because communication costs time and money. And last but not least: all has been done before, so use it!



How to start and implement a FOT

At the start of a FOT a number of steps have to be taken that are very important for the further implementation of the FOT. These steps at the start of a FOT are on the left-hand side of the FESTA-V (assumption is that the function that will be tested is already identified and described in detail): use cases, research questions and hypotheses, performance indicators, study design, measures and sensors, and the FOTIP: FOT Implementation Plan. A description of these steps can be found in the FESTA Handbook. FOT-Net has organised several seminars on the topic of starting and implementing a FOT. From these seminars practical recommendations with regard to the steps mentioned above are deduced. Per topic these recommendations are as follows.

When it comes to formulating **research questions, hypotheses and use cases** two main methods may be used, which are complementary: the top-down approach, starting with the main impacts of system use on safety, efficiency and environmental impacts, and the bottom-up approach starting with use cases, situations, scenarios and events. Both approaches lead to hypotheses that are not generated in a single approach. For defining and prioritising useful hypotheses, group work is necessary. It is not work that can be done by a single person or by distant communication.

For a FOT to run smoothly, a plan of action must be developed defining documents on the scientific, technical, administrative and procedural activities and tasks that are needed to progress successfully through the FESTA-V. The **FOT Implementation Plan (FOTIP)** serves this purpose; it is a checklist for planning and implementing a FOT. It provides a framework and focuses on critical issues (do's and don'ts); there is not one way to run a FOT. Use the FOTIP as a checklist for FOT set-up, structuring and assigning priorities and resources.

FOTIP

The FOTIP is intended to serve primarily as a checklist for planning and running FOTs:

- to highlight the main Activities and Tasks that would normally be undertaken in successfully completing a FOT;
- to ensure that, in running a FOT, researchers and support teams are aware of critical issues that influence the success of the FOT; and
- by drawing on the experiences of previous FOTs, to highlight the “dos” and “don'ts” of running a FOT;
- to provide a consistent framework for planning, running and decommissioning FOTs.

The FOTIP presented in the FESTA Handbook is not intended to be prescriptive, but rather to serve as a generic guide in conducting FOTs. By their very nature FOTs are major projects – extensive and expensive. The FOTIP attempts to map out all known critical issues that need to be taken into account in planning and undertaking a FOT.



Study design

- Sometimes different baselines are needed, for example when it is not possible to turn off a system (for both practical and ethical reasons).
- Working with truck drivers and other professional drivers means that you have to take into account that they have other tasks than just driving.
- Study environment: in the ideal case, you consider geographical location, weather conditions, unusual conditions, etc. However, there are so many aspects to deal with, you cannot take everything into account (for example the weather is hard to predict!), however, you have to be aware of the study environment and the impact it has on your experiment. This awareness enhances the analysis of the obtained data.
- Selection of participants: consider sample size, and participant age, gender, driving typology, personality and attitudes. Women and young drivers may for example be harder to recruit than men.
- In setting up your study design, you cannot take everything into account; sometimes you do not have much choice in your participants, vehicles or study environment. It is important that you are aware of the differences there are and the (implicit) choices you make.
- Aim high in the negotiations for the vehicle fleet since you usually do not get all that you want.

FOTIP / Organisational issues

- Keep in mind that the sponsor might want to read the deliverables beforehand and thus delays dissemination and deployment and make sure there is a clear understanding about this from the beginning.
- Include deployment recommendations in the report, to make sure there is enough attention and time for deployment.
- Have important stakeholders in the steering committee. Make use of it.
- Involve stakeholders with influence on supporting and deployment of technologies e.g. OEMs.
- Do not let sponsors co-manage your FOT – this is complicated, timely and costly.
- Over-resource rather than under-resource: budget more money and time than you think necessary.
- Communicate extensively with those who have experience running FOTs.



How to collect and manage data?

The FESTA handbook provides guidelines and recommendations on how to handle data in FOT and NDS studies. The guidelines cover data collection, data handling and data storage. A description of data from different sources is given, but solutions regarding the handling of the data are missing. Issues related to this will arise during a FOT and NDS study planning phase or at any stage of a study.

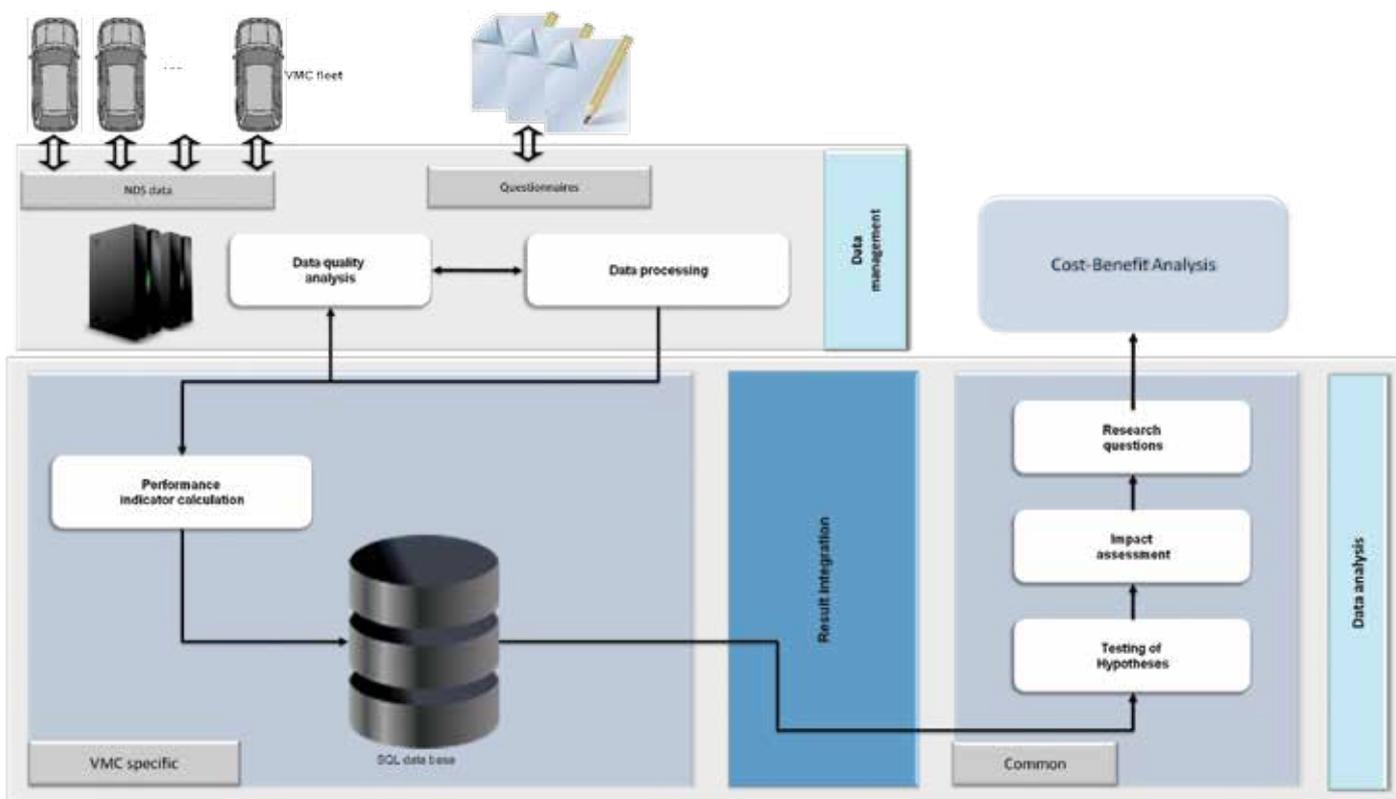
Therefore data collection and data management have been important topics during the FOT-Net activities. These topics were covered in many different aspects. Based on lessons learned from various FOT projects and other experiences and results, recommendations were derived in the different FOT-Net activities.

FOT-Net Wiki

For data acquisition, collection, handling and data analysis a database with different tools that are available was created and is available to the public in the FOT-Net Wiki. All collected tools are clustered into different segments depending on the necessity for usage and in close relation to the main steps defined in the FESTA Handbook, such as tools for preparing, tools for using and tools for analysing. For each of the collected tools additional information is

provided. A general context is given in order to provide details with regards to the manufacturer, usage etc. Additionally technical information is provided to select the best suitable tool for a potential new FOT and NDS.

Altogether more than 80 tools are now available to any visitor of the website <http://wiki.fot-net.eu>.



FOT-Net workshops and seminars

In FOT-Net an exchange of best practises on data collection and data management was facilitated by means of different workshops and seminars. These were held in cooperation with the project partners and the overall FOT/NDS community in Europe and worldwide.

During the project, it became clear that one of the key issues to data collection for cooperative systems is a thorough planning what data needs to be collected and from which source this data is acquired. Data requirements and specifications are the first step and should be done in a very detailed way in the planning phase of each new project. Pilot testing also has been identified as one crucial element in the FESTA chain before the main study is to be started. This includes all measures of quality control and data validation of the overall data handling procedure.

Round tables on data analysis topics have been conducted yearly in combination with the ITS World Congress. These round tables focused on the international exchange between FOT/NDS experts from Europe, US and Japan. Questions addressed in the round tables focused on lessons learned and experiences from large scale FOTs, choosing the right tools for data analysis, limitations of data analysis and new approaches for data analysis, e.g. data mining techniques, research need to improve data analysis techniques.

In terms of data analysis, the main issues were identified in the categories experimental design, data collection, data processing, data analysis and others. The amount of data to be collected needs to be estimated based on the duration of the study, the number of participants and the study design. Large data sets need to be processed and stored in an appropriate manner taking processing time into

account, which might influence the data analysis duration significantly. Common analysis standards, methods and tools would help to reduce the amount of efforts, but are currently not available. A special attention has been put on video data. Currently there is no automated data evaluation possible for pure video data and manual evaluation requires high efforts with regards to time, costs and accuracy of the results. The analysis of driver relevant data (e.g. subjective data from travel diaries and objective data from eye tracker) is also important, but requires more research with regard to methodology and standards.

All presentations and reports from the workshops can be downloaded from the FOT-Net website www.fot-net.eu.

FOT-Net workshops and seminars

- 6 International workshops
- 14 Seminars
- 10 Stakeholder meetings
- 5 Webinars
- 4 Workshops

Outcomes from the meetings are available on www.fot-net.eu.



How to evaluate combinations of systems?

When evaluating impact, many FOTs are faced with the significant challenge of having to isolate casual factors from amongst combinations of functions¹ or systems² within the experimental environment. The evaluation therefore needs to de-bundle these combinations which may not only make use of the same sensors, controllers, or actuators, but may also have interactive effects.

One such common bundle is the combination of Adaptive Cruise Control (ACC) and Forward Collision Warning (FCW). Indeed, the second-generation of the former generally implements a warning function to indicate to the driver when the deceleration demanded of the ACC (in order to prevent a collision with the following vehicle) is beyond the function's designed capability. In other cases, a FOT may be investigating a function that resides on a platform (e.g. a smartphone or SatNav) which offers many other functions so that evaluation is, once again, not straightforward. When cooperative systems are addressed, combined effects may become even more complicated.

Formulating research questions and hypotheses

In planning the evaluation of a FOT, it is important to consider how functions may interact with each other and how those interactions might affect user behaviour. This needs to be done at the stage of a FOT where research questions and hypotheses are initially formulated. Two essential questions to be addressed are as follows:

1. Can the effects of the various functions be disentangled?

2. Does the experimental design need to be modified to enable both the single effects of each function to be investigated as well as the effect of the functions in combination?

With reference to point 1, note that some functions are now hard-coded and it is no longer possible for them to be

disentangled. For example, an ACC/FCW system cannot be driven in ACC mode with the FCW switched off. Indeed disabling the FCW functionality within an ACC could be considered unethical and may be impossible for practical reasons.

In formulating hypotheses, it is useful to think of the synergistic effects that one function may have on another. Thus the recommended procedure is to start with the individual functions and then to proceed to combinatory effects. A description of the steps required in this procedure can be found in the FESTA Handbook. The application of this procedure should produce a comprehensive set of hypotheses on how the functions might interact and should affect the subsequent experimental design.

“ There is no process that can assure that all the “correct” hypotheses are formulated. To a large extent, creating hypotheses is an intuitive process, in which a combination of knowledge and judgement is applied. ”

The FESTA Handbook

¹ A function is the implementation of a set of rules to achieve a specified goal such as Forward Collision Warning (FCW).

² A system is defined as a combination of hardware and software elements enabling one or more functions, e.g. headway sensor + controller + HMI (Human Machine Interface). An element of a system can be another system at the same time, and it is then called a subsystem which can be a controlling or controlled system or which can contain hardware, software and manual operations.

The evaluation of the combined effects of the systems or functions being studied may require complex experimental designs which are associated with large practical costs due to the number of different baselines. Another problem with a full experimental design is the difficulty in getting the participants to comply with all the different conditions of the experimental design.

Alternatives offering greater efficiency and which overcome these problems can be considered. Laboratory experiments on driving simulators can be adopted to examine synergistic effects and a priori analysis can be applied at an early stage in a FOT to identify combinations that are of particular interest and which should therefore be the focus of attention. This can lead to a satisfactory but incomplete experimental design.

When deciding what tests to do in a FOT, what experimental set-up to follow and what hypotheses to test, it is necessary to find the right balance between:

- Costs, resources and benefits
- Science and practicality
- Research questions and hypotheses and combinations
- Prioritization of research questions and hypotheses

and to:

- Undertake detailed analysis of hypotheses, events and performance indicators
- Combine the hypotheses of the single systems to generate those for the bundle of applications

- Test development of a first “rough” experimental design; iterative process in order to improve the rough design during the next steps

More specific to the evaluation of the effects of a combination of functions or systems is the need to identify interactions between them such as:

- Simultaneous warnings
- Do systems affect the same performance indicators?
- Do systems have a common switch, common HMI?
- Common influencing factors



How to disseminate FOT results?

One of the important objectives of FOT-net dissemination activities is to promote the progress, findings and results of various Field Operational Tests carried out at European and national level. FOT-Net has developed a range of dissemination tools and services which the FOTs can access to increase the visibility of your FOT results at European level.

The FOT-Net website, www.fot-net.eu has been an important tool for disseminating information about FOTs. After the end of the current FOT-Net project, the sources of information will continue as a platform for FOTs for communicating.

The FOT Wiki

The FOT Wiki is an open platform of information about FOTs, which can be accessed and modified freely by members of the FOT community. The main section of the Wiki is the FOT catalogue, which provides an extensive list of past and present FOTs from around the world, with dedicated pages on the identified FOTs, and classification of the FOTs by theme (e.g., autonomous systems, cooperative systems), by location (European, north American, Asia-Pacific), by type of project (e.g., FOT, methodology) and by year of activity.

How did the FOTs make use of the website?

- To report on FOT progress and findings in the news section – this section is regularly updated
- To promote an event organised in the context of the FOT project, for instance, a showcase, seminar, workshop or press conference, among others. This appears in the events section
- The most recent news and events items appear in a rolling banner on the website home page
- Selected news and events appear in the FOT-Net newsflash which is produced regularly and distributed to more than 1050 contacts.



Events and media opportunities

Organising a conference or other dissemination activity around a demonstration/pilot/test is an ideal way of communicating because it enables the audience to experience hands-on the systems and services tested. Demonstration and FOT projects can turn into showcases and similar activities as taking part in a practical demonstration can make a far greater impact on an individual than traditional dissemination means such as a presentation or poster.

It could be worthwhile to make use of other well-established events, which are not necessarily technology led. This would enable the FOTs to reach out to an ‘unconverted’ audience.

Such events include:

- **Car Fairs and Shows**
- **European Mobility Week** (www.mobilityweek.eu)
- **European Road Safety Day**
- **Sustainable Energy Week** (<http://www.eusew.eu/>)
- **Green Week** (<http://ec.europa.eu/environment/greenweek/>)

Media can be broken down into two main groups: the specialised media and general media. The former tends to have a technical and specialised readership and, in the case of FOTs, it applies mainly to magazines on transport, ITS and cars, which tend to be published at either national or European level. The latter covers the wider media including national and regional newspapers and television and can therefore potentially reach out to a far wider audience.

It is essential to focus on the advantages these functions provide for the individual in their everyday use as well as for society in general. Communication should be based on very concrete examples of ICT-based functions and their benefits, on success stories and on important benchmarking results. The public can be approached both in a direct and indirect way. In the first case they are addressed directly, e.g. through public events, showcases, etc., while in the second case the information reaches them through intermediary channels such as the media. Test sites offer an interesting focal point for national and local media. Special attention should be paid to opportunities where the media could actually test the applications and thus experience the benefits at first hand, e.g. through road shows, exhibitions, and showcases.

Selected specialised magazines.

- **Thinking Highways**
- **Local transport today**
- **Traffic technology international**
- **Intelligent Highway**
- **IET intelligent transport systems**
- **ITS solutions**
- **Eurotransport**
- **ITS international**
- **Automotive news**
- **World Highways**
- **Mobility magazine**



Special attention should be paid to opportunities where the media could actually test the applications and thus experience the benefits at first hand, e.g. through road shows, exhibitions, and showcases

How to deploy FOT results?

The contribution to policy goals and market deployment are common objectives of large-scale FOTs. Nevertheless, before FOT-Net there was a lack of systematic studies investigating whether these goals are reached and what aspects contribute to successful deployment. Therefore, FOT-Net aimed at bridging this gap by performing a survey-based stakeholder needs analysis including the experiences of all relevant stakeholder categories.

In addition a workshop was organised including the opinions of experts from the field of co-operative systems. Finally, detailed statements of a road operator, a car maker and the network of European cities were retrieved. This text builds a synthesis of these different sources of information.



According to the results of the surveys, stakeholders have a large variety of expectations when first participating in a FOT. At this stage aspects concerning research and development, as for example impact analysis or system testing, play the most prominent role but also instrumental aspects (e.g. gaining experience or collaboration), and deployment related expectations (e.g. economy/business case or promotion) are repeatedly mentioned. According to the large majority of stakeholders, those expectations have been met by the FOT they participated in. In FOTs where this was not fully the case, deployment related reasons seem to be most relevant. This is also reflected within the current expectations that are mainly related to deployment as well as a high interest in collaboration. Stakeholders therefore see FOTs as a step on the way towards future deployment of systems. This should be considered along the entire chain from planning a FOT up to its dissemination.

Benefits of FOT results

Based on the different data sources, a list of benefits of FOT results was generated, that are of relevance for the involved organisations:

- **Direct outcomes** of FOTs, the results of the analysis of the data gathered. In terms of the FESTA methodology this refers to the impact that a full scale introduction of the tested system is expected to have. These results can be used to build a business case or a policy case, and decisions whether to promote the system. Even if the data gathered from a FOT are not sufficient for a full scale analysis, this may also lead to the conclusion that a larger or more specific data base is needed in order to move further towards system deployment.
- **Experience gained with the system** tested in the FOT, leading to product improvement, policy decisions, or standardisation. According to participants in the workshop, FOTs are an important and critical step for deployment and provide valuable results for the system and functions validation.
- The FOT may have gained a better understanding of **participant behaviour**, technology acceptance, willingness to pay etc. This knowledge can be deployed for wide scale introduction of systems or for product development geared towards the needs of users. Also the inclusion of end users in the system test might help with building the basis for a wide-spread acceptance of a system.
- **Tools** developed or adapted for the FOT, for example the data acquisition system or analysis tools may be deployed on a commercial basis.

Benefits of FOT results continued

- **Data** gathered in FOTs may be deployed for further analysis, also to investigate new research questions.
 - **Experiences gained in the organisation** of a FOT, leading to a better position in becoming a partner in a new FOT project, and to organise the next FOT more efficiently.
 - **Experiences gained in applying the FOT methodology** may be deployed to improve the methodology and to apply it in further projects.
 - **Contacts** made with other organisations or people during the FOT can be used for future FOTs but even more relevant for related business or activities. An example is the joint experience of a car maker with road operators.
- This shared experience can set the organisational and human foundations for a collaborative deployment of new technology. During the stakeholder workshop it was specifically mentioned that this is a valuable opportunity to create trust in the supply chain.
- The **publicity** generated in the FOT, and the awareness of ITS by a wider public, may be used to promote the use of ITS or to promote the organisations involved in the FOT.
 - Last but not least, scientific results may be used to generate **scientific publications**, a major deployment for academic institutions.

Considering these benefits some challenges with regard to public authorities can be drawn for the successful deployment of FOT results:

- It is important that the results of the FOT can be reflected in the policies and the objectives of policy makers and public authorities. For example, if a reduction of a specific number of road casualties is a central policy goal, the FOT results should refer to this number.
- In order to enable an appropriate use of FOT results towards the deployment of ITS systems, it is important to involve authorities in relevant FOTs from the beginning - especially with regard to development of the research questions. This ensures that the results are valuable for the public body in terms of meeting their mobility policies and fulfilling their core objectives.
- This also means including the public authorities in the set up of the evaluation of the FOT. This will increase the possibility for deployment of the FOT results in e.g. the urban environment as long as the FOT demonstrates cost-effectiveness. After all the challenge is to prove that the savings are worth the money. The FESTA methodology foresees a socioeconomic impact assessment, and here it is important to tailor the assessment to meet the needs of the stakeholders.



FOT-Net conclusions and recommendations

The FOT-Net project has been giving support to FOT implementation, dissemination and potential deployment of results. Activities have been numerous, including an update of the FESTA methodology, updating of the FOT catalogue on the FOT-Net Wiki, networking activities and dissemination through the FOT-Net website.

One agreed methodology for all FOTs

To improve the visibility, comparability and transferability of FOT results at national and European level, the common European FOT methodology, FESTA was developed in the FESTA project funded by the European Commission. Presented in handbook format, the FESTA methodology gives general guidance on organisational issues, methodology and procedures, data acquisition and storage, and evaluation. During the FOT-Net project the FESTA Methodology has been revised and is currently available in its fifth revision. The latest update of the FESTA methodology is the result of the networking activities that have been ongoing during the project. The handbook can be downloaded from the FOT-Net website or browsed chapter-by-chapter or by FESTA section on the FOT-Net Wiki.

The FOT-Net Catalogue

The FOT catalogue – set up as a Wiki tool maintained by the FOT community – serves as a reference for all FOT organisers. The FOT Wiki is a growing source of information on FOT projects in Europe (national and pan-European) and across the world. It also includes an inventory of tools for FOTs, which lists tools used during the steps of the FOT chain from data acquisition and management, to database structure and analysis. The inventory aims to collect all FOT tools as far as they are accessible and public. The FESTA methodology can be browsed on the Wiki. A Glossary is also a feature of the FOT Wiki. By the end of 2013, some 70 FOTs and NDS are available in the Wiki along with 12 Pilot projects. Furthermore a massive library of more than 80 tools for data preparations, building and using databases as well as tools for evaluation can now be found on the Wiki. This information can serve as very useful input in all phases of the FOTs.

Visit wiki.fot-net.eu to learn and share information on your FOT project!

Networking activities

Members of the FOT community have met regularly at European and international workshops, many organised by FOT-Net, to raise and share problems encountered in the execution of FOTs and to find common solutions.

FOT-Net has offered a series of in-depth seminars to promote the use of the FESTA methodology, and to address specific issues arising when organising a FOT, which require further attention and expertise. FOT-Net has also run a number of Working Groups set up to determine how key parts of the FESTA methodology have performed in the FOTs and to refine the FESTA methodology further where required. Experts from the FOT community have been invited to discuss issues such as data analysis, events and incident definition, legal and ethical issues, impact assessment and scaling up, and data sharing.

Promote

FOT-Net has offered the FOTs the opportunity to increase their visibility at European and global level. The FOT-Net portal, newsletters, press activities and events have been used to raise awareness of FOT activities and results. The 'FOT-Net guide to dissemination for FOT projects in Europe' provides guidance on how the FOTs can make use of FOT-Net dissemination activities, and gives tips on FOT dissemination actions. This guide has further been supplemented with examples of FOT dissemination good practice.

Deployment of results

The contribution to policy goals and market deployment are common objectives of large-scale FOTs. FOT-Net aimed at bridging this gap by performing a survey-based stakeholder needs analysis including the experiences of all relevant stakeholder categories. In addition a workshop was organised including the opinions of experts from the field of co-operative systems. The first step in the process of supporting deployment has been to show how the stakeholders can benefit from the FOT results. The survey gave the answers to this and the list of benefits can be found in this brochure. However, even though there are benefits for stakeholders further deployment requires considerable work from the FOTs, including making sure that the results can be reflected in the mobility policies of the city, that policy makers are involved in the FOTs at an early stage to make sure that the research question is also addressing policies and finally that the evaluation of the FOT is carried out to facilitate the uptake by city authorities.

FOT-Net Data

Despite FOT-Net2 now coming to an end, there will still be a need for supporting FOTs. There will be new players in the field and it will be important to continuously guide the FOTs towards the FESTA methodology. These support actions will be carried out by a new project: FOT-Net Data.

While FOT-Net has until now focused on setting up the FOT network and maintaining the FOT methodology, FOT-Net Data explicitly addresses the need to exploit the collected data. The prime goal of FOT-Net Data is to maintain and increase the momentum achieved in FOT-Net and develop the strategy for sharing and exploiting collected FOT data. FOT-Net Data develops and promotes a framework

for sharing data. It takes into account the pre-requisites necessary in the FOTs, such as legal agreements, to enable future re-use of collected data.

FOT-Net Data will act as a multiplier for the dissemination and awareness of FOT activities especially in terms of inter-activities support and outreach. The Wiki and the FOT-Net website will be managed by the FOT-Net Data project.

Pictures:

p03: Shutterstock

p05: Shutterstock

p19: Shutterstock

All other pictures provided by FOT-Net partners and FOT projects mentioned.



The FOT-Net Community

FOT-Net gathers stakeholders from the public and private sectors. The consortium consists of steering members (contracted partners) and associated partners. For the full list of partners, see <http://www.fot-net.eu/en/partnership/>

The consortium is open to active participation from the FOT community.

Join us now!

More information

For more information on the network, please visit www.fot-net.eu or contact the consortium on info@fot-net.eu

www.fot-net.eu

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