

**EUROPEAN COMMISSION
DG CONNECT**

**SEVENTH FRAMEWORK PROGRAMME
INFORMATION AND COMMUNICATION TECHNOLOGIES
COORDINATION AND SUPPORT ACTION**

FOT-Net Data

FIELD OPERATIONAL TEST NETWORKING AND DATA SHARING SUPPORT



D1.2 FINAL FOT-NET DATA REPORT

Deliverable no.	D1.2
Dissemination level	Public
Work Package no.	WP1
Main author(s)	Sami Koskinen (VTT)
Co-author(s)	Helena Gellerman (SAFER), Satu Innamaa (VTT), Davide Brizzolara (ERTICO), Haibo Chen and Yvonne Barnard (UNIVLEEDS), Adrian Zlocki (IKA)
Status (F: final, D: draft)	F
Version number	1.1
Date	13 April 2017
Project Start Date and Duration	January 2014, 36 months

www.fot-net.eu



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 610453

Document Control Sheet

Editor(s): Sami Koskinen

Work area: WP1

Document title: D1.2 Final FOT-Net Data Report

Version history:

Version number	Date	Main author	Summary of changes
0.3	30.12.2016	Sami Koskinen	First input from partners
0.4	19.1.2017	Satu Innamaa	Review of Summary and some other Chapters, input for Chapters 2.3 and 5
0.6	25.1.2017	Helena Gellerman	Text regarding DSF and changed position of DSF implementations to Main results. Added data sharing in practice in 3 instead.
0.7	27.1.2017	Satu Innamaa	Review on updates, input to 2.3.1
1.0	2.2.2017	Sami Koskinen	Review version
1.1	13.4.2017	Sami Koskinen	Final version, annexes on publications and societal implications included

Review:

Name	Date
Satu Innamaa	31.1.2017

Circulation:

Recipient	Date of submission
EC	13.4.2017
FOT-Net Data consortium	13.4.2017

PROJECT FINAL REPORT

Grant Agreement number: 610453

Project acronym: FOT-NET DATA

Project title: Field Operational Test Networking and Data Sharing Support

Funding Scheme: Coordination and Support Action

Period covered: from 1 January 2014 to 31 December 2016

Name, title and organisation of the scientific representative of the project's coordinator:

Sami Koskinen

Senior Scientist, D.Sc. (Tech.)

VTT Technical Research Centre of Finland Ltd

Tekniikankatu 1, 33720 Tampere, Finland

Tel: +358 40 516 2391

E-mail: sami.koskinen@vtt.fi

Table of Contents

Table of Contents	4
Executive Summary	6
1 Project Content and Objectives	7
1.1 Background and Objectives of the Project	7
1.2 Bringing Stakeholders Together	8
1.3 FOT-Net Wiki and Catalogues	9
1.4 Data Sharing Framework	9
1.5 Promoting the FESTA Handbook	9
1.6 International Collaboration	9
1.7 FOT-Net Data at a Glance	10
2 Main Results	11
2.1 Networking Activities and Information Exchange	11
2.2 Data Sharing Framework	12
2.3 FOT-Net Wiki Catalogues	13
2.3.1 FOT Catalogue	13
2.3.2 Data Catalogue	14
2.3.3 Tool Catalogue	14
2.4 FESTA Handbook	15
2.5 Data Sharing Framework Implementations	16
2.5.1 UDRIVE	17
2.5.2 Danish ITS Platform Data	17
2.5.3 ANDS	18
2.5.4 Trafisafe	18
2.5.5 ECSEL ENABLE-S3	19
2.5.6 L3Pilot	19
2.5.7 US Datasets	19
3 Status of FOT Data Sharing	21
3.1 Benefits	21
3.2 Costs of Data Sharing	22
3.3 Barriers and Enablers	23
3.4 Data Sharing in Practice	25
3.4.1 SHRP2	25
3.4.2 UDRIVE	25

3.4.3	RDE	26
3.4.4	euroFOT	27
3.5	FOT-Net's Recommendations	27
4	Impact and Dissemination	29
4.1	FOT-Net Events	30
4.1.1	ITS Congress Events and Stakeholder Meetings	30
4.1.2	Workshops	31
4.1.3	Webinars	32
4.2	Main Publications	33
4.3	Associated Partners	34
5	Discussion	35
	Annex I. Use and Dissemination of Foreground	37
	Annex II. Report on societal implications	45

Executive Summary

FOT-Net Data was a Coordination and Support Action in the EU 7th Framework Programme for Research. The project's full name was 'Field Operational Test Networking and Data Sharing Support'. It lasted for three years, from January 2014 to December 2016. The main aim of the project was to make data collected in Field Operational Tests (FOTs) more widely available to researchers, public authorities and industry.

The project FOT-Net Data was a continuation of FOT-Net activities. FOT-Net is a networking platform open to all stakeholders interested in FOTs. The network was established in 2008 to let FOT experts benefit from each other's experiences as well as to give an international dimension to local activities. It organizes international workshops, publishes a series of newsletters, and promotes and updates FESTA – a European handbook on FOT methodology.

The main impact of FOT-Net Data project comes through the 31 member organisations of the network, including several from outside Europe. This FOT community, with common views on many methodology topics, has widely affected how large-scale user tests are carried out in a comparable way, worldwide. Over the period of FOT-Net Data, U.S. DOT and Japanese MLIT collaborated in organising the yearly FOT-Net events at ITS World Congresses. Also several other events featured speakers from outside Europe. In total, FOT-Net Data organized fifteen public events and six webinars.

Since 2008, the EU has supported a number of projects enabling testing of latest vehicle information technology in large-scale field trials. Thousands of drivers have been able to test the most promising prototypes or products just entering the markets. In these tests, drivers' behaviour whilst using the systems has been monitored for continuous periods of up to more than a year, collecting valuable information from traffic. The Commission and the FOT community recognise the importance of making the collected data more widely available. Although the datasets have already been analysed in the projects that collected them, there is much potential for re-using them in new studies that may focus on different research questions. Sharing the collected valuable datasets from the recent years will yield further research results, support education at high levels and contribute to market introduction of improved vehicle ICT.

FOT-Net Data published a Data Sharing Framework as a complement to FESTA. The framework contains a set of guidelines and best practices on data management and sharing. FOT-Net tailored general open data concepts to suit FOTs and consulted FOT network members for gaining wide acceptance for the principles. The Data Sharing Framework is an important asset for new FOTs and proposal-writers. It allows projects to learn the new concepts of open data and respond to data sharing requirements set by public funders.

FOT Wiki has contained information from most notable FOTs worldwide and tools utilised in them. FOT-Net Data added a new Data Catalogue to list available datasets and to promote their re-use. Until the catalogue was brought online, it was difficult for analysts to get details on collected datasets, gain access to them or even know whom to contact.

The key activities of FOT-Net will continue in the CARTRE support action in 2017–2018. CARTRE will focus on automated driving tests and continue networking and data sharing activities.

1 Project Content and Objectives

1.1 Background and Objectives of the Project

FOT-Net Data was a Coordination and Support Action in the EU 7th Framework Programme for Research. The project's full name was 'Field Operational Test Networking and Data Sharing Support'. It was a three-year project (2014–2016), whose main aim was to make data collected in Field Operational Tests (FOTs) more widely available to researchers, public authorities and industry.

In general terms, FOTs are large-scale user tests where, for example, a hundred participants are recruited to try out a system that is in the late prototype phase or just entering the markets. The period of testing commonly varies between a few months and two years. During this testing period, questionnaires, measurements and observations are made to find out how the system potentially changes the participants' driving and travelling behaviour or take-up and user acceptance. FOTs also study the effects on other road users and wider impacts on transport system and society.

The project FOT-Net Data was a continuation of FOT-Net's activities. FOT-Net is a networking platform open to all stakeholders interested in Field Operational Tests. The network was established in 2008 as a European support action to let FOT experts benefit from each other's experiences as well as to give an international dimension to local activities. It organizes international workshops, publishes a series of newsletters and promotes FESTA – a European handbook on FOT methodology. So far, 23 research organisations and companies have joined the network as associated partners, including several from outside Europe.

Since 2008, the EU has supported a number of projects enabling testing of latest vehicle information technology in large-scale field trials. Thousands of drivers have been able to test the most promising prototypes or products just entering the markets. The drivers have been testing systems such as the adaptive cruise control, forward collision warning, navigators and most recently, warning systems based on short-range wireless communication between vehicles (C-ITS). The communication can provide information, for example, on nearby car accidents or approaching emergency vehicles. Field test projects have evaluated the impacts of these technologies and contributed to their introduction. Driver behaviour whilst using the systems has been monitored for continuous periods of up to more than a year, collecting valuable information from the field.

The Commission and the FOT community recognise the importance of making the collected data more widely available. Although the data has already been analysed in the projects that collected it, there is much potential for re-using it in new studies that may focus on different research questions. Sharing the collected valuable datasets from the recent years will yield further research results, support education at high levels and contribute to market introduction of improved vehicle ICT.

The main objectives of FOT-Net Data were to:

- Support efficient sharing and re-use of FOT datasets
- Develop and promote a framework for sharing data

- Build a detailed catalogue of available data and tools
- Operate an international networking platform for FOT activities.

The Figure 1 visualizes the central objectives of FOT-Net Data: networking, methodology, FOTs, data, re-use and sharing.



Figure 1. FOT-Net Data's central topics.

1.2 Bringing Stakeholders Together

FOT-Net has been the point of reference for anyone interested in Field Operational Tests, their set-up and results. It is open to all stakeholders from public and private sectors. FOT-Net members meet regularly at European and international workshops to identify working items and address common experiences related to running FOTs.

The issues discussed reflect the stakeholders' priorities with respect to FOT activities, for example methodology, planning and preparation, operation, analysis, evaluation and the link between FOTs and deployment.

The FOT-Net Data project kept the momentum of the FOT network and delivered new perspectives with regard to sharing and re-use of globally available FOT and Naturalistic Driving Study (NDS) datasets. FOT-Net Data offered a series of in-depth seminars and webinars to promote the use of a common FOT methodology and to address issues that require further attention and come up when organising an FOT. Through its dissemination channels and newsletters, FOT-Net has kept the community informed about the FOT developments in Europe and beyond.

FOT-Net organised several workshops, networking events and webinars yearly, all of which were open to public. There was no participation fee. The events have featured relevant topics in the community:

- Data sharing guidelines and re-use of data
- Anonymisation of personal data
- C-ITS deployment pilots
- Upcoming H2020 testing activities on automated driving and methodology related to them.

1.3 FOT-Net Wiki and Catalogues

The FOT Catalogue – set up as a wiki tool maintained by the FOT community – serves as a reference for all FOT organisers. The wiki is a growing source of information on FOT projects across the world. Visit <http://wiki.fot-net.eu>.

While the FOT Catalogue already includes a comprehensive catalogue of field trials and naturalistic driving studies carried out in the recent years, FOT-Net Data has compiled further details regarding available FOT research datasets and tools related to them.

FOT-Net Data project has set up a new Data Catalogue and updated the Tool Catalogue in the FOT-Net Wiki to facilitate data re-use. These catalogues support potential data re-users in identifying interesting, suitable datasets, as well as tools for their research. The target has been to make the catalogues easy-to-use.

1.4 Data Sharing Framework

FOT-Net Data project compiled the first version of the Data Sharing Framework (DSF), a set of guidelines and procedures to assist FOT organizers in practicalities of data sharing. The framework addresses several areas: It discusses legal topics such as test user consent forms, participants' privacy and topics to include in data sharing agreements. It also addresses documentation of key information from FOT execution and collected datasets, ensuring that the datasets can be re-used. It gives hands-on recommendations for how to protect personal and confidential commercial data. It provides guidance on financial models to cover data management costs. Finally, an overview is given on the suggested content in data application procedures and the support services related to data sharing. The framework complements the FESTA Methodology.

1.5 Promoting the FESTA Handbook

To improve comparability and significance of FOT results at national and European levels, the FESTA project, funded by the European Commission, originally developed a handbook on FOT methodology. The methodology is now owned by the FOT community. It is promoted and it has been periodically updated by FOT-Net. FOT-Net has organised webinars and workshops disseminating the methodology.

FOT-Net Data project revised FESTA Handbook with a focus in data sharing, collecting feedback from several organisations.

1.6 International Collaboration

FOT-Net Data project collaborated beyond European borders. Already in the beginning of the project, FOT-Net Data established contacts with the U.S. Department of Transportation's (DOT) Research Data Exchange (RDE) activities. This collaboration resulted in exchange of data sharing guidelines and getting American speakers to present in several FOT-Net events.

The DOT, Japan's MLIT (Ministry of Land, Infrastructure, Transport and Tourism) and FOT-Net have collaborated in organising large yearly workshops at ITS World congresses: 2014 in Detroit, 2015 in Bordeaux and last, 2016 in Melbourne. These workshops have attracted participants from all around the world.

1.7 FOT-Net Data at a Glance

Duration: 36 months, January 2014 – December 2016

Budget: €1.8m, EU funding €1.4m

Consortium: VTT Technical Research Centre of Finland Ltd, ERTICO – ITS Europe, SAFER Vehicle and Traffic Safety Centre at Chalmers University of Technology, Institut für Kraftfahrzeuge (ika) at RWTH Aachen University, Galician Automotive Technology Centre CTAG, University of Leeds, the European centre of studies on safety and risk analysis CEESAR and the automotive company Daimler.

Associated partners: 23 associated partners, see <http://fot-net.eu/join-us/>

Coordinator: Sami Koskinen, VTT

EC Project Officer: Myriam Coulon-Cantuer, DG CONNECT

Website: <http://www.fot-net.eu>

2 Main Results

This chapter presents the main activities of FOT-Net Data: networking, creation of the DSF, Wiki catalogues, and promotion and updates to the FESTA Handbook.

2.1 *Networking Activities and Information Exchange*

FOT-Net promotes FOT results and international collaboration. The project organised a series of workshops, stakeholder meetings and public events. These events enabled transfer of information and prepared organisations e.g. for adopting new practices of handling research data. The material is available also for independent e-learning.

During FOT-Net Data, C-ITS tests and upcoming deployment were a frequent topic in workshops. Especially the US and Japanese partners presented results from their extensive tests but also European activities like CEF Corridors were presented. Data collection and exchange between organisations is also core in infrastructure-based C-ITS services. This formed a natural link to FOT-Net's discussions on data sharing. While the tests so far have been about collecting research datasets and analysing C-ITS benefits, deployment activities are starting to look into data management changes required by operational phases.

FOT-Net enabled networking between C-ITS tests and promoted FOT methodology and reasons for sharing information. The Japanese, for example, recognized a change during FOT-Net Data in how they now more actively seek international collaboration between testing campaigns. From FOT-Net's perspective, close collaboration with Japan and the US has enabled e.g. the FESTA Handbook to get wider recognition.

In Europe, for some time, there were views that C-ITS FOTs had already been completed and it is time for deployment. During the last two years, it has though become evident, that further testing efforts are needed and another round of tests is starting in Europe. Data management and privacy are key remaining issues.

Naturalistic driving studies (NDS) was another topic receiving attention throughout the FOT-Net Data: UDRIVE project collecting data in Europe, SHRP2 data being re-used in the US and Australians starting a new project. Since NDS projects are well suited for sharing research data, they had a large impact on the DSF development and related workshops.

To network with data experts, FOT-Net also formed links with e-infrastructure organisations and a leading EU project of the field, EUDAT. The knowledge provided by supercomputing organisations was valuable especially on how other disciplines such as e.g. astronomy or medical research approach data management and sharing. E-infrastructure projects regularly consult testing campaigns from different disciplines on how to manage data.

Especially data anonymisation was a topic that attracted participants with very different backgrounds to FOT-Net workshops, e.g. legal councillors and ICT start-ups. Since anonymisation will continue to be a key topic in upcoming FOTs on C-ITS and automated driving, FOT-Net will seek to continue yearly workshops on anonymisation.

Finally, automated driving tests and test facilities are being put up in numerous cities – countries preparing regulation that allows tests on public roads. FOT-Net organised events that focused in these upcoming FOTs, their methodology as well as the needs and ways to

share data. The EU and US are planning to couple prominent projects (“twinning”) and FOT-Net has supported these early discussions by providing an international forum.

FOT-Net and its successor CARTRE (started in October 2016) have been inviting new members to the FOT community from stakeholders involved in planning new automated driving tests. The projects have actively promoted the FESTA Handbook and the DSF to new EU project proposals.

More information on networking as well as details on organized events and publications can be found in Chapter 4 on Impact and Dissemination.

2.2 Data Sharing Framework

FOT-Net Data has developed a DSF to facilitate data sharing globally. The project created the DSF documentation in collaboration with its wide FOT-Net network, to cover various topics and to build acceptance for the framework. The DSF summarizes good data management practices and administrative processes, from the experience of the FOT community. The DSF complements the FESTA methodology. FOT-Net Data disseminated the framework and FESTA methodology by organising workshops and webinars.

Although there were less on-going EU FOT projects than during some earlier years of FOT-Net operation, FOT-Net Data was happy to attract many participants to the activities. Now that the Horizon 2020 FOTs, pilots and C-ITS deployment projects are starting, new large-scale testing projects will seek to collaborate with each other and to use the best practices and knowledge gained in earlier projects.

During the second project year, FOT-Net Data published a draft version of the DSF as three stand-alone reports. The project promoted the drafts within the network and selected expert reviewers to comment on the material and to provide further insight. The final compiled version of the DSF is now available on the project website. During preparation of H2020 FOT project proposals, FOT-Net Data contacted several organisations informing them of the DSF. The framework supports organisations e.g. in planning their contracts and data management in new projects and in how to provide and re-use data in practice.

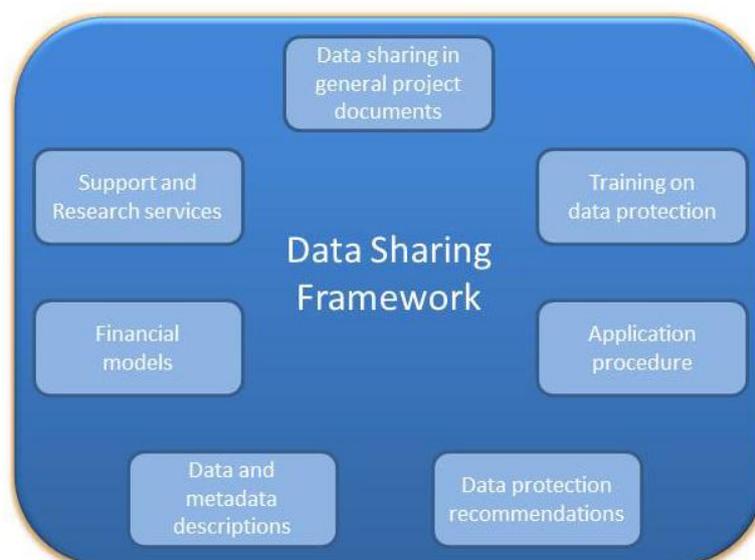


Figure 2. Topics covered by the Data Sharing Framework

The DSF, see Figure 2, consists of:

- Project agreements' content, including guidelines and checklists to incorporate the pre-requisites for data sharing in the agreements, which together with legal and ethical constraints, form the conditions for data sharing. The project agreements include the grant agreement (together with the description of the work), the consortium agreement, the participant agreement and external data provider agreements.
- Data and metadata description recommendations to facilitate the understanding of the context in which the data was collected and the validity of the data. It includes a suggested classification of data and recommendations for metadata, divided into four categories; FOT/NDS study design and execution documentation, descriptive metadata (e.g., how is the data calculated), structural metadata (e.g., how is the data organized) and administrative metadata (e.g., access procedures).
- Data protection recommendations, focusing the FOT/NDS personal and confidential commercial data issues. It consists of security procedures and requirements for data providers in the role of data centres and analysis sites. Each requirement include implementation guidelines.
- Security and privacy training for all involved personnel. The guidelines consists of four parts: who should be trained and when, what content should be part of the training including detailed suggestions, how to do the training and how to document it.
- Support and research services, proposing functions such as providing information/training to facilitate the start-up of projects, offering (for example) processed data for researchers less familiar with FOT/NDS data, making analysis tools available or performing complete research tasks.
- Financial models to provide funding for the data to be maintained and available, and data access services. Eight financial models are discussed and a list of data management costs is provided.
- Application procedures that provide detailed content lists to address and data application forms.

The DSF will be handed over to the European project CARTRE, where the specific requirements for sharing data collected from vehicle automation will be incorporated.

2.3 FOT-Net Wiki Catalogues

2.3.1 FOT Catalogue

FOT-Net's FOT Catalogue serves as an important source of information on past and on-going FOTs and NDSs. It features, at the moment, 265 test campaigns from all around the world.

During the FOT-Net Data project, the functionalities of all the catalogues in the FOT-Net Wiki were updated. The updates aimed at ease of use. Now there is no more need to know wiki syntax to provide entries but they can be made utilising forms with text boxes and drop-down

menus. Updates to the entries can be made with the same form. The current form of the FOT Catalogue enables effective search and browse functionalities.

All the previously entered FOTs and NDSs were transferred to the new FOT Catalogue. Previously, free-form texts were harmonised wherever possible. Those who had made the original entry were contacted to provide them a possibility to check the updated entry, correct and complement it and to provide new entries.

2.3.2 Data Catalogue

Datasets collected in Field Operational Tests (FOTs) of vehicle information technology form a valuable resource for further research. An important method for promoting these datasets is cataloguing them. FOT-Net Data has compiled the first European data catalogue for driving studies and field trials, in tight co-operation with similar international efforts and the FOT community. The datasets included in the catalogue are available for further research work and described in reasonable detail for potential re-users.

The Data Catalogue work was based on the existing FOT-Net Wiki, which contained at the beginning of FOT-Net Data project a FOT Catalogue section describing projects across the world and a Tool Catalogue section describing available tools. During FOT-Net Data project, the FOT-Net Wiki was complemented with a separate *Data Catalogue*.

The main purpose of the Data Catalogue was to support potential data re-users in identifying suitable datasets for their purposes and to facilitate data sharing. The development work for the catalogue was based on three main principles: (1) It is an extension of the previous FOT/NDS Catalogue (wiki); (2) Ease-of-use; and (3) Data remains with their owners. Templates were built and helpful wiki tools were experimented on how to create such as forms and search capabilities for the Data Catalogue.

The catalogue was launched with first datasets described. At first, the catalogue entries were submitted by project partners and the operation of the catalogue was piloted. After a testing period, external organisations were invited to produce entries. The project identified first potential high-priority and otherwise suitable field trial and naturalistic datasets for re-use and contacted them to discuss data sharing possibilities and to get an entry to the Data Catalogue. First those we know personally, later all listed in the FOT Catalogue. From now on, the catalogue should be easily maintainable by the FOT community, since it is built as a wiki. All functionalities included aimed at ease-of-use. A dataset entry can be inputted simply by filling in a form on a web site.

By the end of FOT-Net Data project, 20 datasets were entered to the Data Catalogue totalling 32 sub-sets listed in the catalogue.

2.3.3 Tool Catalogue

The conduction of a FOT or NDS requires specific tools. Several tools are available today. In past projects, such tools were developed by the FOT/NDS partners taking into account the specific needs and requirements of their study. This led to a considerable amount of work, which partly could have been avoided, if existing tools could have been used and additionally, if previous tools would have been developed in a more general way considering a broader field of application and not only the projects they were developed for. A reason besides the missing general tools for non-re-use of FOT/NDS tools has been that project partners are often not aware of what is already available and accessible.

In order to provide an overview of available FOT/NDS tools, FOT-Net has maintained a Tool Catalogue. The functionalities of the Tool Catalogue were updated and all old entries were transferred to the enhanced version. The catalogue can be used by all parties interested in conducting a FOT/NDS. It lists FOT tools and their specifications as far as the information is accessible and public. The catalogue promotes existing tools and their re-use, which can lower FOT costs significantly.

Within FOT-Net Data, a data entry form was created which allows tool suppliers easily to add their tools to the inventory. Using a more structured description allows a re-user to better search for a specific tool and find information and contact details.

In total around 100 tools are online with all available information and descriptions. These tools are classified according to their characteristics.

2.4 FESTA Handbook

In order to provide guidance to the FOTs, the FESTA consortium, consisting of a large number of stakeholders from industry, research, public authorities, and user and network organisations, developed a methodology and produced a handbook. Since 2008, this methodology has not only been adopted by FOTs funded by the European Commission but also by many nationally (or otherwise) funded projects, and has influenced FOTs outside Europe. The methodology has been regularly updated by the FOT-Net support actions, taking into account the lessons learned. The latest update by FOT-Net Data provides recommendations on how data sharing and data re-use should be taken into account throughout the lifecycle of a FOT.

A common FOT methodology ensures that a systematic and scientific approach is adopted by the FOTs. Providing a common general approach and a common vocabulary makes it easier to compare studies on similar systems, to gain a better understanding of the changes in road-users' behaviour, and to interpret outcomes. To perform FOTs, a wide range of expertise is needed, such as on technical, legal and ethical, human factors, statistical, computer science, political, and organizational aspects. By organising workshops, webinars and seminars, and providing documentation and the FOT-Net wiki, the exchange of experiences and lessons learned makes the methodology a living one. The FESTA Handbook is more than a theoretical and practical document, it is the focal point of an international community involved in performing Field Operational Tests and using their outcomes.

FOT-Net Data continued to capture knowledge and lessons-learned on data-sharing and re-use, gained from various sources including public events (e.g. workshops, international conferences, webinars), and inputs from concertation with stakeholders and other projects. These were integrated into the FOT methodology and changes were made to the FESTA Handbook. However, critically overlooking the whole handbook, we concluded that most of the texts and recommendations formulated in it were still valid. So most of the changes concerned minor issues.

Changes in the content specifically focused on data sharing aspects. In the beginning of FOT-Net Data, a number of relevant passages were identified. However, we did not want to completely incorporate the DSF into FESTA document, as FESTA is a condensed document on testing methodology (Figure 3). We therefore checked that when data sharing is important for a certain FESTA step, both a short recommendation is given and a reference supplied to the DSF deliverable. Recommendations are made especially in the areas of

agreements, participants' permissions, dealing with data (such as anonymization and data protection), documentation and metadata.

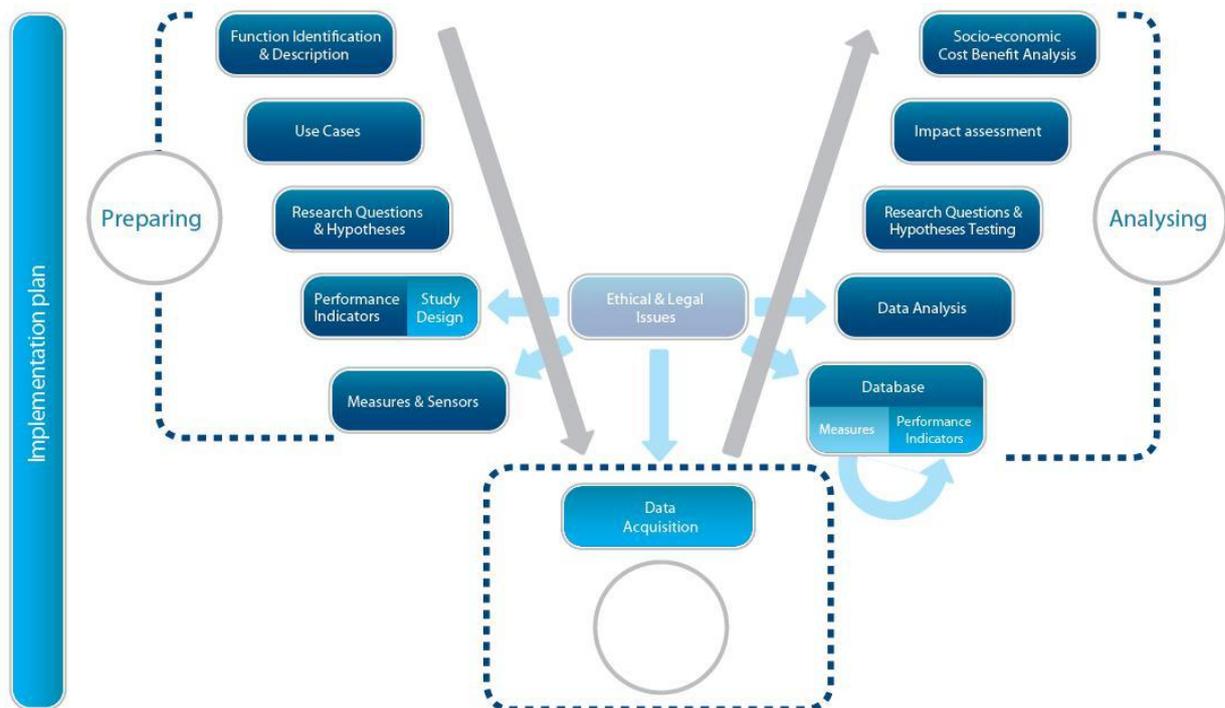


Figure 3. Different phases of a FOT presented as 'FESTA V'

In FESTA update to version 6, some technical information was deleted when deemed out of date and no longer state-of-the-art. A professional language revision was performed, hyperlinks and references were checked and mistakes corrected. With the new version of the FESTA handbook we hope to have delivered a document that will be of use to a wide range of users who will become involved in the next generation of pilots and FOTs. Many practical recommendations may help them to design and conduct these costly and complex tests more efficiently and enhance their quality.

We aimed to have a version that will be easily maintainable in the future, so that the methodology can stay alive and change over the coming period, where the focus will be on new tests of connected and automated vehicles. Above all, we strongly believe that a common evaluation methodology will help in gaining a better understanding of the impacts new ITS and automated systems will have on our society and businesses, shared not only in Europe but also with the further international community. This methodology should not be regarded as strictly prescriptive but as providing a common understanding and basis for the exchange of knowledge, data and experiences.

The next steps in the development of FESTA will be taken in the frame of the CARTRE coordination and support action, focusing on field trials for road automation.

2.5 Data Sharing Framework Implementations

FOT-Net Data disseminated the DSF through different channels, to enhance the knowledge of data sharing pre-requisites and gain knowledge about the implementation level of same or similar procedures. The project also identified projects with interesting datasets for re-use, some of which were funded to implement the DSF, thereby enhancing the possibilities to

share the collected data. In the following, brief summaries of funded cases are reported together with findings of other use of the DSF reported to FOT-Net Data. For further details, please see the deliverable D4.3 on 'Application of Data Sharing Framework in Selected Cases'.

2.5.1 UDRIVE

The European naturalistic driving study UDRIVE (www.udrive.eu) started in 2012, and has thus been running in parallel with both FOT-Net Data and its predecessor FOT-Net 2. UDRIVE has used the checklists and recommendations of FOT-Net when taking data sharing into account in each step of the development of the project. At the same time, UDRIVE needed to detail the data protection requirements in its Data Protection Concept covering the whole data handling chain, and the requirements for data centres and analysis sites were provided to FOT-Net Data who generalized the requirements and incorporated them into the DSF. UDRIVE has made a report on how the different DSF topics were implemented in the project, please see deliverable D4.3.

In short, the UDRIVE description of work incorporated a text where data would be provided to third parties, if financial means were provided. The consortium agreement followed the DSF checklist and ownership, storage and access after the project was addressed. The participant agreement included written consent to data sharing within specified areas. The same template was used for all countries. The external agreements were given special attention, following the DSF.

The data description recommendations are followed, but not yet fully documented, and a special Data Protection Concept was developed covering the data handling from collection to data re-use after the project. All partners need to document how they handle the data.

The analysis in UDRIVE is performed by eleven partners remotely connected from thirteen analysis sites to one Central Data Centre (CDC), hosting all data collected in six countries including video, GPS and confidential data. The same data sharing set-up is planned to be used after the project and training and support services are already in place. Discussions are on-going regarding the possibilities for funding after the project and application forms and procedures will follow the DSF.

2.5.2 Danish ITS Platform Data

Aalborg University (AAU) applied the DSF to a finalized Danish FOT: ITS Platform. The work included anonymisation of the dataset, compiling metadata and creating a training manual for re-users. The AAU provided detailed feedback on the DSF based on the case. Please see deliverable D4.3.

The ITS Platform data consists of GPS-based floating car data (FCD) from 425 privately owned cars for about two years. In order to make the dataset publicly available and to avoid any privacy issues, data anonymisation procedures were developed and carried out: Time and data and car identifiers were removed. In addition, all data close to (using varying distances between 200 and 500 meters) start and ending points of each individual trip were removed.

The DSF was used as a guideline for developing a more complete metadata description and a training manual. Though the development of the anonymization algorithm was the main effort, considerable time was spent beforehand on discussing the financial model and the

related data protection issues. The decision was to anonymize the data and provide it openly without cost. The interesting idea of getting indirect funding through citations was identified.

The first parts of this dataset are already available and the remaining part is planned to be available for the public in the beginning of 2017. This public dataset is expected to consist of more than 10 million km driving data from 1.3 million trips. The dataset is made available at <http://fcd-share.civil.aau.dk/>.

2.5.3 ANDS

The aim of the Australian Naturalistic Driving Study (ANDS, www.ands.unsw.edu.au) is to understand what people do when they drive their cars in normal and safety-critical situations. The study will eventually have collected data from 360 vehicles, using the same logger as was used in SHRP2 study in the US. This opens up the possibility to re-use the SHRP2 research algorithms on the ANDS dataset. December 2016, around 70 percent of the planned vehicles had been instrumented, and the study is expected to be complete in 2018. The collected data includes video, GPS, radar, accelerometer, cell phone, Mobileye data and data from Seeing Machine systems.

University of New South Wales (UNSW), Sydney, investigated the applicability of the DSF guidelines to ANDS. The work was a start for eventually making the valuable dataset available internationally. Due to the phase of the ANDS, the main comparisons between the DSF and ANDS data management were made regarding data protection and metadata.

The investigation showed good compatibility between FOT-Net Data recommendations and existing data access and the management structures of the ANDS project. A few topics were identified that need to be addressed by the ANDS consortium. They relate mostly to balancing freedom of access to data and privacy, and what to include in agreements to ensure access to data also for members outside the consortium. On these topics, the DSF documents were able to provide a useful starting point for development of extended and specific permissions for access. UNSW reported that the DSF guidelines have highlighted also several topics for future discussions, e.g. regarding financial models and training material to be put together.

UNSW considered that the DSF recommendations and guidelines will enhance the possibilities of collaboration between groups that use them in developing FOT or NDS databases. Further, exchange on methodology supports collaboration with other NDS projects, such as the European UDRIVE project, in terms of researching mutually interesting driver behaviour questions. For more details, see deliverable D4.3.

2.5.4 Trafisafe

As a pilot case of data sharing agreements, VTT shared a recent FOT dataset with the University of Leeds for use in a thesis work. The dataset was from a Finnish research project Trafisafe (2012–2014), which focused on driving style feedback for young drivers and their parents. The dataset consists of GPS, tri-axial acceleration data, OBD-based fuel consumption and engine RPM values, and questionnaire responses.

Agreement negotiations raised up interesting discussions in three main areas:

Liability clauses, i.e. what could be the level of damages (financial and reputation) if parts of the dataset would leak out as the dataset contained full GPS data.

Common confidential data protection clauses were included in the contract: e.g. to ensure that those having access to the confidential information should receive advice, and for reasonable measures to be taken in the handling of the dataset. Further, according to good scientific practises, evaluation reports should not show full GPS tracks of single persons.

A PhD candidate made a request that VTT would oversee allocation of main research questions, when/if data is shared for other re-users. This was to avoid a potential issue with two very similar research papers being written at the same time. The request was found reasonable in this case, although it doesn't fit completely the principles related to open datasets. A date was agreed after which VTT could share the data for exactly the same research questions.

The complete DSF was compared with the Trafisafe implementation and used to enhance for instance training material. See deliverable D4.3 for more information.

2.5.5 ECSEL ENABLE-S3

The ENABLE-S3 project (www.enable-s3.eu) deals with scenario-based verification and validation of automated systems. It includes identification and characterisation of datasets. The project has expressed great benefit from FOT-Net's DSF, providing them a ready-to-use solution both for NDS datasets and controlled test experiments.

2.5.6 L3Pilot

The project L3Pilot is a new spearhead project on automated driving that is currently in funding negotiations with the EC. The project is planned to start in mid-2017 and to run for four years. It will focus on large-scale piloting of SAE Level 3 functions of automation, with additional assessment of some Level 4 functions. The project plan leans on both FESTA and FOT Net's DSF guidelines, using them as starting points.

As the project deals with currently very competitive technologies, protecting company IPR requires specific consideration, when sharing test data. Combined with FOT data analysis about participants' behaviour and reactions, making use of both video and GPS, provides many challenges for data sharing, both within the project and after the project. The upcoming project can shed light on what kind of data can, and perhaps should be shared from automated vehicles, both to answer research questions to collect proof on viability of automation but also in a later deployment stage.

2.5.7 US Datasets

The applicability of the Data Sharing Framework on American conditions was examined in a report provided on behalf of the Connected Data Systems Program, U.S. DOT. It also contains reflections of the FESTA methodology. The following and many more, thoughtful reflections can be found in the report (included in D4.3):

The FOT-Net documents can be compared with similar forms of support in the United States to conduct research involving FOTs and early Connected Vehicle (CV) deployments as well as NDS: Guidance for the connected vehicle pilot deployments consists of numerous documents similar to FESTA and there are many connections between documents provided for the users of the Research Data Exchange (RDE), a large data repository, and the content provided in the DSF.

The RDE also reveals implications for standards, intellectual property rights (IPR), data ownership, and privacy. The RDE datasets do not include any private or sensitive data, and the data is in the public domain because the DOT owns the distribution rights and data providers have signed agreements. Large efforts are though being made to develop methods for anonymizing the data, focusing on GPS, especially parts of the Safety Pilot dataset.

The posture of the DSF on the topic of financial models is not unlike the posture of the DOT in regards to insisting that the Connected Vehicle Pilot Deployments be financially sustainable.

The DOT's connected vehicle deployment program and related activities can directly or indirectly use the reports, catalogues, data, tools and lessons learned from FOT-Net. Of considerable interest is protecting PII and IPR and making good use of material that could enhance the RDE as it evolves, for example by providing improved guidance.

One of the main strength in the DSF is the procedures for protecting data at Data Centers and Analysis Sites, according to the report; "As mentioned earlier these requirements may be offered for consideration as national regulations". This shows one example of the potential benefits that could come out from a further common review of the documents.

The report ends with the following conclusion and recommendation:

FOT-Net and sister programs of the ITS JPO have fundamentally similar goals. Their approaches to data sharing, data protection, experimental design and implementation of vehicle and infrastructure applications overlap to a great extent but differ in many ways. The practices identified in this review make clear that FOT-Net (as it is embraced by CARTRE) and the ITS JPO can benefit from continuing to learn about each other's policies, practices, and procedures regarding data sharing, protection and related topics. It is recommended that this comparison of practices periodically be updated and shared with both parties and the broader international community.

The report is included in the D4.3 deliverable.

The second Strategic Highway Research Program (2006–2015), SHRP2, had a requirement from the beginning that its NDS data should be shared after the project. SHRP2 therefore incorporated data sharing pre-requisites into the participant agreements and documented the data. Data protection procedures were developed to protect the collected personal data, such as video and GPS, which can only be accessed on the premises of Virginia Tech. Other datasets are made available via a web interface. SHRP2 was awarded 25 million dollars to continue to keep the data available and fund research during four years. This funding is partly used to keep the data maintained and accessible, and provide support services for researchers wanting to re-use the data. A full set of application procedures and application forms have been developed.

3 Status of FOT Data Sharing

Today, practically all scientific disciplines are looking into open data practices. However, there are differences between disciplines:

- Data types and use differ. Where some disciplines have reached standardisation level with their data and documentation, others are yet considering what information is important to document from collected data.
- The disciplines which deal with personal and confidential commercial data are seeking out various solutions to protect the data, creating agreements and financial models. Collaboration between disciplines gives good examples but not necessarily ready answers.

FOT/NDS data has, based on its nature of including personal data, been kept well protected and in most cases only been used during the original project. FOT-Net Data assessed how the open data practices in use today could apply to FOTs. The result was that the requirements from full FOT datasets, including video and GPS, are not accommodated by today's solutions. In most datasets, GPS is collected. Anonymising GPS to the level where it could be provided as open data takes considerable efforts. The way forward to more openly be able to share video and GPS, is to further develop tools for anonymisation combined with methods for feature extraction especially focusing video, so that the personal data could be securely maintained while the essential information could be shared.

3.1 Benefits

The benefits of data sharing are numerous, especially from societal perspective. Sharing the valuable FOT datasets will

- yield further research results
- support education at high levels, and
- contribute to market introduction of improved vehicle ICT.

From the viewpoints of those who share or re-use data, the main benefits include:

SHARE	REUSE
<ul style="list-style-type: none"> – References to your original work and supplementing results – New collaboration options – May be part of financing contract 	<ul style="list-style-type: none"> – Access large sets of quality data – Financial and time savings – Post-processed indexes and shared tools for a faster start

Figure 4. Benefits for those who either share or re-use data

The DSF can be used by new and existing data collection projects worldwide to facilitate data sharing. It also provides guidance if already collected datasets are to be shared. The

DSF is influenced and created by the persons that have been involved in large FOTs over the last decade, and thus the DSF has a very practical viewpoint.

3.2 Costs of Data Sharing

There are costs related to data sharing and usually those depend on the size, complexity and sensitivity of a dataset. It must although be stressed, that re-using an existing dataset is usually by far less expensive than collecting new data.

Plainly hosting a large dataset and organising proper backups, to avoid losing data, incurs costs. Data may also have to be anonymised to enable wider sharing. When sharing a dataset, licences or agreements need to be completed as well as financial arrangements.

As a result, the list of data management cost items can grow long. The following Table 1 lists cost items involved in data sharing, after data collection has ended.

Table 1. Data sharing costs

Cost item	Timing of cost
Data selection, enhancement of documentation (metadata), creation of entries in relevant data catalogues	When project / data collection ends
Anonymizing data	Before data is shared
Management & coordination personnel costs	Continuous
IT operations	Continuous
Analysis or data handling facilities	Continuous
Analysis support services	When data is shared and during analysis efforts
Promotion and advertisement	When project ends / continuous
Optional: Standardisation and collaboration regarding dataset formats	Continuous

Depending on the dataset, a long list of cost items does not necessarily mean that data sharing causes a huge burden on organisations. Effective processes, support and tools provided by professional teams can also reduce the stress on single projects. Data sharing experience and infrastructure are needed to make sharing easier and to reap the benefits. Projects have to prepare for data sharing from the start, to include it in their good scientific practice.

FOT-Net Data collected eight financial models that could enable funding for data management and sharing after the main field test effort has ended.

As the main funding for transport-related research today comes from direct governmental grants, that is likely to be the case also for data re-use. Future funding might get directed into established data sharing and e-infrastructure activities, when the pre-requisites, such as anonymization of personal data, are present. From the financial models discussed in the DSF, the first two (A and B) are based on such outcomes.

Project-based funding is one of the current methods for financing data sharing. The models C–E consider the pros and cons of including data sharing and re-use directly into the project activities. In the models F–H, the costs fall mainly on the end user e.g. through membership fees or licenses.

Table 2. Data sharing financial models

Financial model	Example	Costs for re-user
A – Organisations' core activity	Public funding directed to preservation activities, e.g. university digital library	Non-profit price
B – e-Infrastructures	Publicly funded supercomputing centres, additional services have a price	Free (basic services)
C – Archival included in project budget	Research team storing data in archival services	Free or non-profit price
D – Project extension	Multi-million projects apply for extensions to promote their data	Free or non-profit price, even calls for analysis proposals
E – New project funding	Research projects using previous datasets	Commercial price
F – Established network	Accident data collection and sharing	Different levels of memberships and fees
G – Analysis services	Notable data owners offering services	Commercial price
H – Data integrators	Road operators putting together information services	Commercial price

3.3 *Barriers and Enablers*

Table 3 lists common concerns related to opening FOT datasets. It also suggests methods to overcome these concerns.

Table 3. Barriers and enablers of FOT data sharing

BARRIERS	ENABLERS
Privacy and product confidentiality	<ul style="list-style-type: none"> ✓ Agreements ✓ Data protection ✓ Data anonymization and processing to reduce details ✓ Feature extraction
Quality issues	<ul style="list-style-type: none"> ✓ Scientific methodology ✓ Data description and documentation
Poor or missing agreements	<ul style="list-style-type: none"> ✓ Data sharing framework
Lack of resources	<ul style="list-style-type: none"> ✓ Financial models ✓ Public funding requirements ✓ e-Infrastructures
Lack of trust	<ul style="list-style-type: none"> ✓ Win-win collaboration ✓ Data protection ✓ Training ✓ Data description and documentation

The main concerns are related to privacy and product confidentiality. The DSF addresses many of these issues by discussing data anonymisation developments and topics to be cover in data agreements. However, this is a case-by-case discussion.

Quality of data is an easier topic, although data documentation has been neglected in many past FOTs. New scientists in FOTs should be given an introduction on how to include data sharing practices in their work and how to document FOT data. Data documentation could also form a mandatory deliverable in new projects.

Finally, in a field relatively new to data sharing, it is important to seek and promote success stories of data sharing. Based on discussions with FOT-Net members, many of the successful data sharing projects seem to have had their origin from seeking mutual benefit and new collaboration options.

3.4 Data Sharing in Practice

In the following, brief summaries of some success stories of data sharing are reported. They pave the way for enhancing the awareness of FOT/NDS datasets and their value. Some ten years ago, there was scepticism from different research fields of the value of FOT data, as it was collected in a naturalistic way and different from a traditional controlled experimental point of view of performing research. The last five years and numerous papers later, the appreciation of FOT/NDS datasets has changed and specific conferences on naturalistic data research are arranged. Still, the full potential of this data is to be explored and the following example datasets could be used as inspiration.

3.4.1 SHRP2

Since SHRP2 was finalized in the spring of 2015 and the data made available, many different stakeholders have begun to mine the data to explore questions in a variety of research areas. The SHRP2 database contains NDS data from over 3,500 drivers recruited from six locations in the United States, in total more than 5 million trips. Data include video, sensor, vehicle network, and participant assessment data, as well as summary data related to events and trips. Roadway elements can be obtained from the Roadway Information Database (RID).

The main SHRP2 usage covers understanding and further developing safety performance measures and developing data analysis tools and methods, whereas the full scope includes driver distraction, infrastructure analysis, driver age-related issues, driver fatigue and impairment, roadway lighting, fuel economy, and pedestrian/vehicle conflicts. The breadth of use underscores the importance of making naturalistic data sets widely known so that researchers can figure out how datasets collected globally can be used in their respective research areas.

The users of the SHRP2 data are from different parts of the world, the majority being from the United States. The data can be accessed either via a website or through research-specific requests for data. Ten percent of users are original equipment manufacturers (OEMs), 10% are private firms excluding OEMs, and 10% are public health organizations, federal laboratories, and overseas universities, as of spring 2016. The requestors have levels of expertise ranging from undergraduate students to noted researchers.

Data access is based on the level of detail requested and the need for personally identifying information (PII) either through the InSight website (<https://insight.shrp2nds.us>) or via a data use license (DUL). Video and GPS can only be accessed within a secure data enclave. There were 174 active DULs for SHRP2 data, and between 20 and 30 requests per month as of two years after the dataset was opened up for re-use.

The SHRP2 NDS data and analyses are already providing new insights into driver behaviour, both during safety-critical events such as crashes and during normal driving. The variety of researchers reusing the SHRP2 data points out the potential value still to be explored in naturalistic datasets worldwide.

3.4.2 UDRIVE

UDRIVE is the first large-scale European Naturalistic Driving Study on 120 cars, 50 trucks and 40 powered two wheelers. The data is collected in six sites located in: France, The Netherlands, Germany, The United Kingdom, Poland, and Spain. The acquired data

includes: CAN, Mobileye, video (seven views: driver face, pedals, cockpit, steering wheel, front middle, left front, right front), GNSS, and questionnaires.

UDRIVE is by definition a data sharing project. Data management is centralised since all the collected pre-processed data is stored and managed by the CDC. The CDC provides remote access to all analysis sites, and all analysis is performed on one single dataset. Algorithms are developed in the remote environment at the CDC and then applied to the dataset. The data sharing set-up is currently used in the project and is therefore already tested, when data re-use starts after the project.

To protect the data throughout the data handling chain, a “Data Protection Concept” was developed. The concept also sets the specific requirements for data protection after the project. The data can be remotely accessed after the project by third parties. To protect the personal data, video and GPS, these data can only be accessed via a secure enclave at one of the project partners having remote access to the CDC.

The project has not been provided funding for maintaining the dataset after the project and discussions are on-going to seek other possibilities. Data sharing is depending on that a solution can be found.

3.4.3 RDE

The Research Data Exchange (RDE) is a core element of the USDOT's Connected Data Systems Program. The RDE is intended to support research, analysis, application development, and testing. Its purpose is to provide a variety of data-related services that support the development, testing, and demonstration of multi-modal transportation mobility, weather, and environmental applications.

RDE hosts several datasets available for re-use. It has an eight-step process for evaluating data and preparing it for posting. First, a sample data is assessed for quality, completeness, value for research, and presence of sensitive data. Then full data set is assed for same issues. If approved, logical structure for data file organisation is designed, and comprehensive documentation is prepared. After these steps, the dataset can be posted on the RDE.

RDE publicise the datasets to registered and potential users. The total of registered users was 1 725 in period April to June 2016 (Figure 5). 41% of the users are from universities and 40% of private companies. Government sector totals 10% of users and individual users 9%.

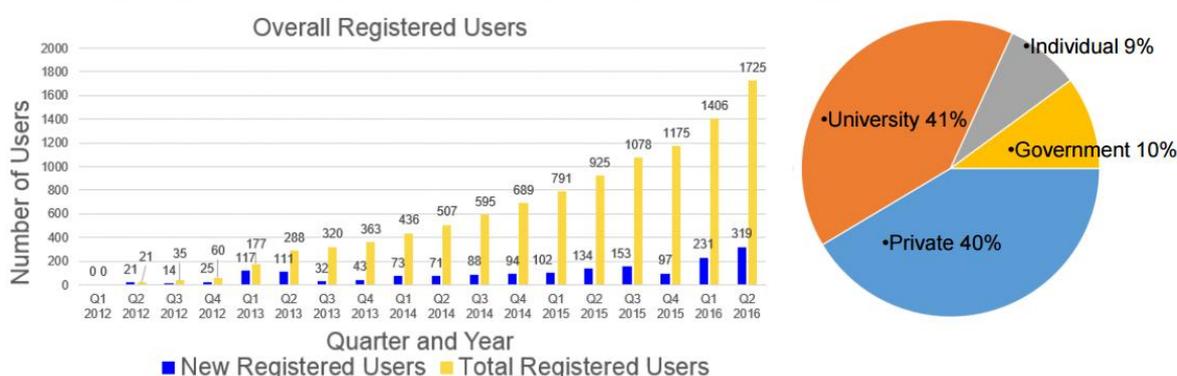


Figure 5. RDE Users ([R. Glassco, FOT-Net workshop Sep 2016](#))

3.4.4 euroFOT

The EU project euroFOT took place 2008–2012. Eight collection sites in six countries collected data. The datasets were gathered with different loggers collecting various levels of data, ranging from CAN-only loggers to CAN+video+extra, including eyetrackers. Large datasets were collected, the largest being the Swedish dataset of 50 TB, where data from both Volvo Cars and Volvo Trucks were included.

In 2008, the main focus was to make the participants accept that the data could be re-used. Data sharing was not yet in focus but to make the original partners being able to take further advantage of the large datasets. Therefore, the pre-requisites for sharing data with third parties were not inserted into participant agreements and the datasets cannot be shared outside of the original partners.

Still, extensive re-use of the data has been done, especially in Sweden, Germany and France. The data has been used for a large variety of research, including extracting information to assist in developing driver models, studying why crashes occur through annotating crash-relevant events, investigating the road curvature's effect on driver behaviour and position of the body. In recent years, the number of re-use cases started to rise, as the interest in understanding what is normal driving and what is the driver's safety margin zone was triggered by the focus in automation and to develop algorithms to make self-driving vehicles blend in in mixed traffic.

euroFOT partners can re-use the datasets in new projects and provide the results to consortiums.

3.5 FOT-Net's Recommendations

FOT-Net Data interviewed several organisations on how open data practices apply to large-scale user testing of vehicle ICT. In addition, networking meetings enabled the project to assess what kind of requirements would be reasonable to place on upcoming FOTs. The following list reflects the recommendations and requirements collected in these discussions:

1. Basic preparations for data sharing should become part of good scientific practise. These include, especially, legal agreement templates that enable data sharing and detailed documentation of collected data.
2. Relevant projects should be required to provide a public Data Management and Re-Use Plan. This document, provided early on in the project, would enable project members and funders to assess the data sharing options.
3. EU projects should include a deliverable that describes their main dataset (metadata): public description of the content along with main properties of the study design. Data provision should also be considered as a deliverable.
4. Projects should be obliged to contribute information describing their re-usable datasets and tools to public catalogues, such as the FOT-Net's Data Catalogue and FOT Tool Catalogue.
5. By the establishment of a public catalogue, discoverability of datasets has been improved. FOT-Net Data has provided such a catalogue, but it must be maintained in the future.

6. In selected calls for proposals, the option to re-use data from existing datasets should be made explicit.
7. There is a need for data anonymisation research projects that would focus on techniques to extract/keep relevant features while anonymising datasets. The output of such projects should be applied on existing datasets that today are prohibited to be shared. The positive side-effect of such implementations is also that existing datasets could be drastically improved.
8. An archive-keeping organisation, like the recent e-infrastructure efforts, is needed to store data from projects that are not able to maintain the data themselves.
9. Data sharing needs to be facilitated by providing support and training of researchers wanting to re-use data. Separate promotion activities could look into open data training and dissemination of best practises for new scientists.

To continue the efforts started by FOT-Net, the following tasks should be taken up e.g. by upcoming EU support actions:

- a) Setting up a sustainable organisation for data sharing and adequate financial procedures
- b) Promoting and further implementing the data sharing platform developed in FOT-Net Data
- c) Offering support and training for re-use
- d) Promoting sharing and re-use of data
- e) Forming a brokering function between data owners and potential re-users.

4 Impact and Dissemination

This chapter discusses how FOT-Net Data as a networking activity has impacted the FOT community and what dissemination activities it has used.

Networking enables exchange of information

FOT-Net has its origins in enabling exchange of information between FOT stakeholders. Networking events enable discussing topical issues, future research agenda and forming new partnerships. A key topic of FOT-Net has been learning from each other; exchanging tips, documents, tools, and helping people to catch on to FOT methodology faster.

The main impact of FOT-Net comes through the 31 member organisations of the network, and though several others, who occasionally took part in FOT-Net activities. This FOT community, with common views on many methodology topics, can widely affect how large-scale user tests are carried out in a comparable way, worldwide.

Trilateral collaboration to harmonise research

Over the period of FOT-Net Data, Japanese MLIT contributed to all our international events. During this time, there was a noticeable change on how results and tests were presented by them: in the end, we used common terminology and more similar ways of presenting FOT analysis results. FOT-Net provided an international platform for projects to network and openly share information as well as invite experts to national main events. The Japanese C-ITS tests, for example, have featured exceptionally large infrastructure and scope.

FOT-Net collaborated for three years and in organising numerous events with US DOT and its contractors Booz Allen Hamilton and Noblis. The collaboration included exchange on the RDE, large C-ITS FOTs, and most recently, on development of an impact assessment framework for automated driving tests.

Public events and newsletters boost visibility of FOTs

FOT-Net workshops and events have offered possibilities for FOTs to promote their work, especially the results, data and tools.

FOT-Net periodically features ongoing FOTs in newsletters, disseminating status updates. For the FOT community, the newsletters have been a method for learning also of national testing campaigns and getting contact information.

The project released two newsletters each year. The newsletters were distributed at European and international events such as the ITS World. They are available also on the official FOT-Net Data website for download (<http://fot-net.eu/library/>).

Catalogues provide information and new contacts

FOT Catalogue in the FOT-Net Wiki contains information from most notable FOTs worldwide. The lists have sometimes been used by researchers to even list FOTs that have been carried out in their own country. Also, when researchers look for contact info and basic facts of a FOT, the catalogues have proven to be useful.

The new Data Catalogue has so far inspired a couple of contacts that have reached FOT-Net's awareness. Until the catalogue was brought online, it was difficult for analysts to get details on collected data and access to it. Therefore, there has been little inquiries in the past on FOT datasets.

Common methodology improves efficiency and scientific quality of FOTs

The FESTA Handbook is a collection of guidelines and information from numerous organisations. Studying it, possibly starting from FOT-Net webinars on FESTA, enables organisations to get a fast start into FOTs. After all, FOTs have been over the years claimed to expensive and tediously long to prepare. This is not necessarily the case: when an organisation is familiar with the FOT methodology, has some paperwork ready and good contacts to tool providers, FOTs don't have to be expensive. They are a tool as any other, and there is a continuous need for large-scale user testing.

The views on FOTs as difficult possibly stem from the fact that not many engineers and researchers are familiar with user testing. For example, when a project plan reads “develop a system to be tested with 100 drivers”, many grasp only the first part of the sentence. Prototype development is what many engineers do, but the same people may not have experience on recruiting test drivers through newspapers or arranging test user briefings. FOTs contain numerous steps to carry out – not necessarily difficult as single steps, but in total they can take a long time to learn.

The learning process is something that FOT-Net and FESTA try to speed up – to get tests going faster, using existing methods, legal advice, analysis tips and suggesting tools.

A proven methodology can improve the scientific value of research results and provide comparability between tests. FESTA, after the recent update, contains reasoning e.g. on what data should be collected.

Data sharing framework advances open data

Opening datasets for re-use has several foreseen benefits, especially on societal level. If data is provided to a larger community, the breadth of possible research topics will expand into disciplines not foreseen by the original project collecting the data. As an example, SHRPs data is currently used to answer a broad range of research questions.

Data sharing framework targeted to FOT/NDS data facilitates the provision of this data to an extended research community. Many topics are in common with open data policies for other disciplines, but the specific content of FOT data, including personal and commercial data, calls for new anonymisation methods for the data to be openly shared. In recent years, considerable efforts have been made in this domain and tools are expected to be available within the near future. Sharing the extracted rich features of video openly, while keeping the video in secure enclaves, will open up the possibilities for transport research, development of vehicle systems and new commercial systems.

4.1 FOT-Net Events

FOT-Net core over the years have been the numerous workshops that have been organised. They allow FOT community to exchange and plan next steps. The following covers the different events that FOT-Net organised in the last three years. All materials are publicly available from project website.

4.1.1 ITS Congress Events and Stakeholder Meetings

What FOT-Net has considered its main events, are the yearly meetings at ITS World Congresses, taking place right before the opening ceremonies. They have regularly attracted more than 50 participants from around the world and have been a place for largest testing campaigns in the world to present their status.

Another, almost as prominent event has been the yearly stakeholder meeting in Brussels, targeting European industry and policy makers.

Workshop	Date	Place/Topics
A FOT-Net workshop in connection to ITS World Congress, organized three times	7 September 2014, 5 October 2015, 10 October 2016	Detroit, Bordeaux, Melbourne. Topics: International collaboration, connected vehicles and automated driving
European Stakeholder Meeting, organised three times	19 March 2014, 10 March 2015, 8 March 2016	Amsterdam, Brussels, Brussels. Topics: Open Data and Data Re-use
Session at ITS European Congress, twice	17 June 2014, 8 June 2016	Helsinki: "Do not let large datasets go to waste" Glasgow: "Towards a methodology for Field Operational Tests for automated vehicles"

4.1.2 Workshops

Five workshops were organised in order to transfer knowledge on data re-use and sharing in FOTs. The workshops were organised in a similar way as the seminars in the previous FOT-Net 2 project, because this had proved to be a successful formula. An extra workshop was organised on data anonymisation. The first one was very successful, but as the problems around anonymisation are not yet solved and techniques are evolving, a second workshop on this topic was considered very useful.

The Hands-on workshop took a different approach on the organisation, it was blended workshop held at three locations as well as enabling online participation, combining small group activities with plenary webinars.

Workshop Topic	Date/Time	Place
Data re-use	16-17 December 2014	UPC, Barcelona
Data anonymization (organized twice)	01-02 September 2015 31 Aug – 1 Sep 2016	Lindholmen Science Park, Gothenburg

A common methodology for road automation	03-04 February 2016	Devonshire Hall, Leeds
Hands-on data re-use	14 September 2016 12 December 2016	3 locations (i.e. Aachen, Gothenburg, Helsinki) with remote participation A spin-off of this workshop was held in Guangzhou (China)
Revising FESTA Handbook	22–23 November 2016	Virtual meeting, combination of plenaries and assigned work
Final event	14–15 December 2016	Brussels

4.1.3 Webinars

FOT-Net offers e-learning modules about the FESTA methodology by organising webinars and making these presentations available on the project website.

In total, six webinars were recorded. The first five webinars presented FESTA methodology after it had been revised at the end of the FOT-Net 2 project. The last webinar addressed data sharing and data re-use, based on the outcomes of this project and the experiences gained during the workshops organised during the course of FOT-Net Data.

The webinars were especially targeted to participants who were (relatively) new to FOTs and who wanted to become familiar with the methodology. The materials and presentations used in the webinars were used to create stand-alone e-learning modules that were put on-line.

The webinar 6 was attended by 50 participants, others by 20–30 participants. Additionally, an average of 40 viewers have watched them on YouTube and downloaded the presentations afterwards.

Webinar topic	Date	Speaker
1 – Context, functions, research questions <i>etc.</i>	12/11/2014	Oliver Carsten UNIVLEEDS
2 – Performance indicators, study design <i>etc.</i>	19/11/2014	Yvonne Bamard ERTICO
3 – Ethical and legal issues	26/11/2014	Helena Gellerman SAFER

4 – Databases and data analysis	20/05/2015	Felix Fahrenkrog IKA
5 – Impact assessment and analysis	27/05/2015	Pirkko Rämä VTT
6 – Data Sharing Process	24/05/2016	Helena Gellerman SAFER

4.2 Main Publications

Several papers have been submitted for European and International Events. The main FOT-Net Data publications are now available on the FOT-Net Data Library:

- Book chapter on “Data Management and Data Sharing in Field Operational Tests” in Intelligent Transportation Systems: From Good Practices to Standards. Edited by Paolo Pagano. Taylor & Francis Group, CRC Press. eBook ISBN: 978-1-4987-2187-5
- Book chapter: ‘Field Operational Tests and Deployment Plans’, within the book ‘Vehicular ad hoc Networks’
- Paper: Data Sharing Framework for Naturalistic Driving Data, a technical paper presented at the technical paper presented at the European World Congress 2015.
- Paper: Data catalogue for field operational tests. ITS World Congress and Exhibition on Intelligent Transport Systems and Services, October 2015, Bordeaux
- Paper: Data Sharing of Transport Research Data, presented at Transport Research Arena, in April 2016, Warsaw.
- Paper: Methodology for Field Operational Tests of Automated Vehicles, presented at Transport Research Arena 2016, in April 2016, Warsaw.
- Paper: Anonymization of Data from Field Operational Tests, presented at ITS European Congress, in June 2016, Glasgow.
- Paper: Towards a methodology for Field Operational Tests (FOTs) for automated vehicles, at ITS European Congress, in June 2016, Glasgow.
- Paper: A Platform for Sharing Data of Field Operational Tests, presented at ITS World Congress Detroit, in September 2014.
- Paper: Generating summaries from field operational test data, presented at ITS World Congress Detroit, in September 2014.

Some articles have been also published on the paper/journals specialised in Intelligent Transport Systems (e.g. Thinking Highway - <http://fot-net.eu/Documents/the-point-of-departure/>)

4.3 Associated Partners

Associated partnership entails contribution to FOT-Net's networking, knowledge-sharing and promotional activities. FOT-Net and its successor CARTRE project are open to welcome new Associated Partners to the worldwide FOT network.

FOT-Net's Associated Partners have been consulted in the scope of the FOT Networking Platform, DSF, FOT Data Catalogue and FESTA methodology. They help to address common issues related to the execution of FOTs.

The list of FOT-Net's associated partners:

- Connekt / ITS Netherlands
- Continental (ADC Automotive Distance Control Systems GmbH)
- DLR-Institute for Transportation Systems
- TNO
- ITS United Kingdom
- Nissan
- UMTRI
- Orange
- Würzburg Institute for Traffic Sciences (WIVW)
- Institute for Road Safety Research
- Loughborough University
- Traffic Research Group at Aalborg University
- OHL Concesiones (representing FOTsis project)
- University of Dresden (VUFO at University of Technology Dresden)
- Netport
- IFSTTAR
- OC Mobility Coaching
- BAST
- University of Surrey
- TSS-Transport Simulation Systems S.L.
- MLC ITS Euskadi (representing smartCEM project)
- LAB Renault PSA
- Centre for Research and Technology Hellas – Hellenic Institute of Transport (CERTH/HIT).

Most of the associated partners confirmed their participation in the very beginning of the project, as active participants to previous FOT-Net events.

5 Discussion

During the last ten years, FOTs have established their position in Europe as a key tool for assessing the impacts of upcoming ITS. The Commission and the FOT community have recognised the importance of making the collected data more widely available. Although the datasets have already been analysed in the projects that collected them, there is much potential for re-using them in new studies that focus on different research questions. Sharing the collected valuable datasets from the recent years will yield further research results, support education at high levels and contribute to market introduction of improved vehicle ICT. The main aim of the FOT-Net Data project was to make data collected in FOTs more widely available to researchers, public authorities and industry.

The FOT-Net Data project was a continuation of the FOT-Net activities. FOT-Net is a networking platform open to all stakeholders interested in FOTs. It was established in 2008 to let FOT experts benefit from each other's experiences as well as to give an international dimension to local activities. Therefore, some of the long-time goals of FOT-Net have been information exchange, letting others learn from past tests, and maintaining a European handbook on FOT methodology – the FESTA Handbook. Condensing key advice into a handbook supports especially newcomers but enables wide methodology harmonisation as well. Comparable methodology produces comparable results that are scientifically valid. Large-scale tests are expected by everyone to provide proof on impacts and viability of new ITS.

The FOT-Net Data project's main outcome was the Data Sharing Framework, DSF. It complements FESTA Handbook and compiles advice on data management and how to prepare for data re-use. It supports new projects on what pre-requisites for data sharing to include during and after the project and how to protect participant privacy and company IPR when sharing data. The DSF also elaborates on the possibilities for the necessary funding for maintenance and provision of data after the project. The framework was developed together with the FOT community collecting input and feedback with workshops, stakeholder meetings, webinars, by making interviews in ITS World Congresses and by assigning experts directly to comment the framework. The DSF has already affected new FOTs in Europe as well as overseas.

Another main output of the FOT-Net Data project was the update of FOT-Net Wiki to include a new catalogue of data available for re-use. FOT-Net also promotes collected datasets in this Data Catalogue. The catalogue targets re-users from different stakeholder groups as well as promotes the services and analyses that are offered by the original group that collected the data. Information on data in a catalogue format is vital for potential re-users. Harmonised processes for data description and methodology also contribute to the collection of high-quality data that is of real interest for further work. First datasets have been entered to the catalogue. The Data Catalogue has been promoted in all FOT-Net events and by making an attempt to contact those marked as contact person for FOTs and NDSs in the FOT Catalogue.

FOT-Net has promoted the use of FESTA to all large-scale user tests and included advice on testing the latest technology. FESTA principles are valuable for deployment as well as for early pilot projects. FESTA promotes scientific rigour, value for public funders and reliable results.

Recently, the FOT community has been discussing tests related to C-ITS deployment and automated driving. FESTA Handbook already contains specific advice regarding C-ITS. FOT-Net has started to collect material regarding automated driving to be included in an upcoming update of the FESTA Handbook. The next update regarding automation will be completed by a new support action CARTRE that carries on key FOT-Net activities.

The next large step for FOTs will be the field testing of automated driving, including self-driving vehicles. As fundamental changes in traffic will start to take place, all kinds of insights in the impacts are needed to support public authorities, industry and the general public in forming their opinions and strategies. This means that there is an even stronger need for data sharing. If datasets are shared to a larger degree than in the past, it will be possible to find evidence on the effects of the introduction and use of automated vehicles much faster. Industrial competition may be a main obstacle, but it is in everyone's interest to ensure that the introduction of automation does not have negative consequences on impact areas such as safety and traffic efficiency.

Data sharing is an idea not necessarily welcome by those dealing with product development. However, data sharing from FOTs is about sharing data on user response and proof that tested systems have intended effects and support societal goals. Confidential product implementation details are not shared, unless under specific beneficial cooperation. FOTs are to promote technology and fine-tune final glitches before deployment.

Not only the sharing of new data is of interest for automation, also the existing FOT data is very useful. Data on relevant driving situations will be necessary for the design and development of automated systems, especially to make automated vehicles to blend in in mixed traffic situations. Also other evaluation methods, such as virtual simulations, need this data. This "relevant situations" data cannot easily be collected by one company or consortium only, so sharing is a necessity.

Data sharing and openness have long been wished for. The benefits are clear and numerous, but there are many steps still to be taken to open up FOT data. For instance, the development of anonymization and feature extraction methods and tools to safeguard personal and commercial data, and providing sustainable funding to maintain high-value FOT/NDS datasets. The Data Sharing Framework addresses this issue and suggests steps to be included as good scientific practice.

From a societal perspective, data sharing concepts are now being piloted. Hard requirements to share data have not been placed on all publicly funded projects. However, promising success stories start to pile up, suggesting that data sharing is worth more than the trouble providing the data. Especially the naturalistic driving studies have gained wide re-user base. When results from data re-use complement original results or spin a new research project, the ideas of data sharing are well received.

The benefits from open data practices for the society, i.e. more research results from utilising the original public investment for data collection, will drive and force upcoming FOTs to share data more openly. A gradual change can be foreseen in how ITS research is being done and funded. However, as the open data principles are currently being tested in various scientific disciplines, and supporting e-infrastructure is currently being put up, the full extent of the change is yet to be determined. As re-use of datasets is gradually gaining ground in scientific work, it should no longer be a principle that all scientists gather their own dataset to work with.

Annex I. Use and Dissemination of Foreground

Section A

According to the final reporting template by EC, this section A includes two public templates:

- Template A1: List of all scientific (peer reviewed) publications relating to the foreground of the project.
- Template A2: List of all dissemination activities (publications, conferences, workshops, web sites/applications, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters).

TEMPLATE A1: LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES

NO.	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers ¹ (if available)	Is/Will open access ² provided to this publication?
1	Data Management and Data Sharing in Field Operational Tests	Yvonne Barnard, Sami Koskinen, Satu Innamaa, Helena Gellerman, Erik Svanberg, Adrian Zlocki and Haibo Chen	Book chapter in: Intelligent Transportation Systems: From Good Practices to Standards	August 23, 2016	CRC Press	Boca Raton, FL	2016	59-70	Print ISBN: 978-1-4987-2186-8 eBook ISBN: 978-1-4987-2187-5 DOI: 10.1201/9781315370866-4	no
2	Field Operational Tests and Deployment Plans	Barnard, Y., Fischer, F., Flament, M.	Book chapter in: Vehicular ad hoc Networks		Springer International Publishing	Switzerland	2015	pp. 393-408		no
3	A platform for sharing data from field operational tests	Barnard, Yvonne	Proceedings of ITS World Congress	7-11 September 2014	Intelligent Transportation Society of	Detroit	2014			Yes

¹ A permanent identifier should be a persistent link to the published version full text if open access or abstract if article is pay per view) or to the final manuscript accepted for publication (link to article in repository).

² Open Access is defined as free of charge access for anyone via Internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

					America					
4	Generating summaries from field operational test data	Koskinen, Sami	Proceedings of ITS World Congress	7-11 September 2014	Intelligent Transportation Society of America	Detroit	2014			Yes
5	Data catalogue for field operational tests	Innamaa, Satu	Proceedings of ITS World Congress	5-9 October 2015	ERTICO	Bordeaux	2015			Yes
6	Anonymization of Data from Field Operational Tests	Yvonne Barnard, Helena Gellerman, Sami Koskinen, Haibo Chen and Davide Brizzolara	Proceedings of ITS European Congress	6-9 June 2016	ERTICO	Glasgow	2016			Yes
7	Data Sharing Framework for Naturalistic Driving Data	Helena Gellerman, Erik Svanberg, Jonas Bärghman and Yvonne Barnard	Proceedings of ITS World Congress	5-9 October 2015	ERTICO	Bordeaux	2015			Yes
8	FOT project agreements are crucial for data sharing	Helena Gellerman and Erik Svanberg	Proceedings of ITS World Congress	10-14 October 2016	ERTICO	Melbourne	2016			Yes
9	Data sharing of transport research data	Helena Gellerman, Erik Svanberg and Yvonne Barnard	Transportation Research Procedia	18-21 April 2016	Elsevier	Warsaw	2016			Yes
10	Methodology for Field Operational Tests of Automated Vehicles	Yvonne Barnard, Satu Innamaa, Sami Koskinen, Helena Gellerman, Erik Svanberg and Haibo Chen	Transportation Research Procedia	18-21 April 2016	Elsevier	Warsaw	2016			Yes

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES								
NO.	Type of activities ³	Main leader	Title	Date/Period	Place	Type of audience ⁴	Size of audience	Countries addressed
1	Workshop	UNIVLEEDS	Workshop on FOT data re-use	16–17 December 2014	Barcelona	SC, I, PM		EU
2	Workshop	ERT	European concertation meeting	19 March 2014	Amsterdam	SC, I, PM		EU
3	Conference	ERT	International workshop at ITS World Congress	7–11 September 2014	Detroit	SC, I, PM		All
4	Conference	ERT	Stakeholder workshop in ITS European Congress	17 June 2014	Helsinki	SC, I, PM		EU
5	Conference	ERT	International workshop and a congress special session on automated driving FOTs	5–9 October 2015	Bordeaux	SC, I, PM		All
6	Workshop	SAFER	Anonymisation of personal FOT data	1–2 September 2015	Gothenburg	SC, I, PM		EU, US
7	Workshop	ERT	Stakeholder meeting: Open data and data re-use in H2020	10 March 2015	Brussels	SC, I, PM		EU
8	Workshop	VTT	Final event	14–15 December 2016	Brussels	SC, I, PM		EU
9	Conference	ERT	International workshop and a congress special session on automated vehicle pilots	10–14 October 2016	Melbourne	SC, I, PM		All
10	Workshop	SAFER	Workshop on Data Anonymisation	31 August – 1	Gothenburg	SC, I, PM		EU

³ A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

⁴ A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias, Other ('multiple choices' is possible).

				September 2016				
11	Workshop	UNIVLEEDS	Hands-on data re-use	14 September 2016	Aachen, Gothenburg, Espoo	SC, I, PM		EU, US
12	Conference	ERT	Special Interest Session at Glasgow ITS European Congress	8 June 2016	Glasgow	SC, I, PM		EU
13	Workshop	ERT	Stakeholder meeting	8 March 2016	Brussels	SC, I, PM	x	EU, US
14	Workshop	UNIVLEEDS	WS3: Common methodology for road automation FOTs and pilots	3–4 February 2016	Leeds	SC, I	x	EU, US
15	Web	UNIVLEEDS	Webinar 1: "Context, functions, use cases, research questions and hypotheses"	12 November 2014		SC, I		All
16	Web	UNIVLEEDS	Webinar 2: "Performance indicators, Study design and Measures and Sensors"	19 November 2014		SC, I		All
17	Web	UNIVLEEDS	Webinar 3: "Legal and ethical issues"	26 November 2014		SC, I		All
18	Web	UNIVLEEDS	Webinar 4: "Databases, data analysis and hypotheses testing"	20 May 2015		SC, I		All
19	Web	UNIVLEEDS	Webinar 5: "Impact assessment and socio economic cost benefits analysis"	27 May 2015		SC, I		All
20	Web	UNIVLEEDS	Webinar 6: "How to enable a successful data sharing and re-use process"	24 May 2016		SC, I		All
21	Press release	VTT	EU support for sharing field operational test data	12 December 2013		PM		EU
22	Presentation	SAFER	Netport seminar	13–14 May 2014		SC, I		SWE
23	Presentation	CTAG	FOTsis Club Workshop. Moisés Rial gave a presentation on "Lessons learned and future of FOTs deployment"	29 April 2014	Madrid	SC, I		EU
24	Presentation	ERT	BigDataEurope public event. Presentation by Yvonne Barnard on "Intelligent Transport" also presenting the FOT-Net Data project	27 February 2015	Brussels, Belgium	SC, I		EU
25	Presentation	ERT	FOTsis Final event. Presentation by Yvonne Barnard on [FOTsis] Collaboration with FOT-Net	April 2015	Madrid, Spain	SC, I		EU

26	Presentation	SAFER	Workshop on Naturalistic Data analysis at IEEE IV 2015. Presentation of FOT-Net Data by Helena Gellerman	28 June – 1 July 2015	Seoul, South Korea	SC, I		Korea
27	Presentation	VTT	FESTA presentation by VTT at Adaptive Technical Workshop	22 April 2016	Athens	SC, I, PM		EU

Section B

This section specifies exploitable foreground and discusses exploitation plans. No patents or trademarks were registered by FOT-Net Data, therefore, the template B1 is not provided.

The following template B2 describes exploitable foreground:

Type of Exploitable Foreground ⁵	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application ⁶	Timetable, commercial or any other use	Patents or other exploitation (licences) or IPR	Owner & Other Beneficiary(s) involved
General advancement of knowledge	3 catalogues in a Wiki, FOT, Tools, Data	No	.	Documents	H52.2.9 - Other transportation support activities	2016 onwards		FOT-Net community, CARTRE support action
General advancement of knowledge	FESTA Handbook	No		Documents	H52.2.9 - Other transportation support activities	2016 onwards		FOT-Net community, CARTRE support action
General advancement of knowledge	Data Sharing Framework	No		Documents	H52.2.9 - Other transportation support activities	2016 onwards		FOT-Net community, CARTRE support action

¹⁹ A drop down list allows choosing the type of foreground: General advancement of knowledge, Commercial exploitation of R&D results, Exploitation of R&D results via standards, exploitation of results through EU policies, exploitation of results through (social) innovation.

⁶ A drop down list allows choosing the type sector (NACE nomenclature) : http://ec.europa.eu/competition/mergers/cases/index/nace_all.html

All these exploitable results are public and are considered to be owned by the FOT-Net community. To continue updates of the produced material, namely the FESTA Handbook, DSF and FOT-Net Wiki, operational responsibility of compiling updates has already been moved to the CARTRE support action. The CARTRE will continue to promote these resources for new FOT projects and stakeholders.

The FESTA Handbook and the DSF are intended to support new FOTs with methodology and regarding data sharing topics. Past versions of the FESTA Handbook have already been used in most European FOTs during the last nine years.

FESTA provides information on best practices and provides an efficient source for familiarizing oneself about FOT steps such as research questions or recruitment. Sharing information on best practices is considered to speed up testing preparations. Additionally, widespread use of FESTA should lead to harmonization of FOTs and use of scientifically valid methods in tests.

The FOT, Data and Tools catalogues enable promotion of testing campaigns and related data/tools. The listings are helpful and comprehensive enough even for compiling reports of national testing activities.

Annex II. Report on societal implications

This annex contains a filled-in questionnaire from EC's final reporting template. No modifications to the template have been made and all texts have been quoted directly.

Replies to the following questions will assist the Commission to obtain statistics and indicators on societal and socio-economic issues addressed by projects. The questions are arranged in a number of key themes. As well as producing certain statistics, the replies will also help identify those projects that have shown a real engagement with wider societal issues, and thereby identify interesting approaches to these issues and best practices. The replies for individual projects will not be made public.

A General Information *(completed automatically when Grant Agreement number is entered.)*

Grant Agreement Number:

610453

Title of Project:

Field Operational Test Networking and Data Sharing Support

Name and Title of Coordinator:

Dr. Sami Koskinen

B Ethics

1. Did your project undergo an Ethics Review (and/or Screening)?

- If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final project reports?

No

Special Reminder: the progress of compliance with the Ethics Review/Screening Requirements should be described in the Period/Final Project Reports under the Section 3.2.2 'Work Progress and Achievements'

2. Please indicate whether your project involved any of the following issues (tick box) :

No

RESEARCH ON HUMANS

- Did the project involve children?
- Did the project involve patients?
- Did the project involve persons not able to give consent?
- Did the project involve adult healthy volunteers?
- Did the project involve Human genetic material?
- Did the project involve Human biological samples?
- Did the project involve Human data collection?

RESEARCH ON HUMAN EMBRYO/FOETUS

- Did the project involve Human Embryos?

• Did the project involve Human Foetal Tissue / Cells?	
• Did the project involve Human Embryonic Stem Cells (hESCs)?	
• Did the project on human Embryonic Stem Cells involve cells in culture?	
• Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?	
PRIVACY	
• Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?	
• Did the project involve tracking the location or observation of people?	
RESEARCH ON ANIMALS	
• Did the project involve research on animals?	
• Were those animals transgenic small laboratory animals?	
• Were those animals transgenic farm animals?	
• Were those animals cloned farm animals?	
• Were those animals non-human primates?	
RESEARCH INVOLVING DEVELOPING COUNTRIES	
• Did the project involve the use of local resources (genetic, animal, plant etc)?	
• Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	
DUAL USE	
• Research having direct military use	
• Research having the potential for terrorist abuse	

C Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator		1
Work package leaders	2	2
Experienced researchers (i.e. PhD holders)	5	8
PhD Students		1
Other	2	3

4. How many additional researchers (in companies and universities) were recruited specifically for this project? 2

Of which, indicate the number of men:

2

D Gender Aspects		
5. Did you carry out specific Gender Equality Actions under the project?	<input type="radio"/> X	Yes No
6. Which of the following actions did you carry out and how effective were they?		
	Not at all effective	Very effective
<input type="checkbox"/> Design and implement an equal opportunity policy	○ ○ ○ ○ ○	○ ○ ○ ○ ○
<input type="checkbox"/> Set targets to achieve a gender balance in the workforce	○ ○ ○ ○ ○	○ ○ ○ ○ ○
<input type="checkbox"/> Organise conferences and workshops on gender	○ ○ ○ ○ ○	○ ○ ○ ○ ○
<input type="checkbox"/> Actions to improve work-life balance	○ ○ ○ ○ ○	○ ○ ○ ○ ○
<input type="radio"/> Other: <input style="width: 200px;" type="text"/>		
7. Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?		
<input type="radio"/> Yes- please specify <input style="width: 150px;" type="text"/>		
<input checked="" type="radio"/> No		
E Synergies with Science Education		
8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?		
<input checked="" type="radio"/> Yes- please specify	<input style="width: 150px;" type="text" value="Workshop for PhD students on open data"/>	
<input type="radio"/> No		
9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?		
<input checked="" type="radio"/> Yes- please specify	<input style="width: 150px;" type="text" value="Webinars"/>	
<input type="radio"/> No		
F Interdisciplinarity		
10. Which disciplines (see list below) are involved in your project?		
<input type="radio"/> Main discipline ⁷ : 2.3		
<input type="radio"/> Associated discipline ⁷ : 1.1	<input type="radio"/>	Associated discipline ⁷ :
G Engaging with Civil society and policy makers		
11a Did your project engage with societal actors beyond the research community? (if 'No', go to Question 14)	<input checked="" type="radio"/> ○	Yes No

⁷ Insert number from list below (Frascati Manual).

11b If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?			
<input checked="" type="radio"/> No <input type="radio"/> Yes- in determining what research should be performed <input type="radio"/> Yes - in implementing the research <input type="radio"/> Yes, in communicating /disseminating / using the results of the project			
11c In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?			<input type="radio"/> Yes <input checked="" type="radio"/> No
12. Did you engage with government / public bodies or policy makers (including international organisations)			
<input type="radio"/> No <input type="radio"/> Yes- in framing the research agenda <input type="radio"/> Yes - in implementing the research agenda <input checked="" type="radio"/> Yes, in communicating /disseminating / using the results of the project			
13a Will the project generate outputs (expertise or scientific advice) which could be used by policy makers?			
<input type="radio"/> Yes – as a primary objective (please indicate areas below- multiple answers possible) <input checked="" type="radio"/> Yes – as a secondary objective (please indicate areas below - multiple answer possible) <input type="radio"/> No			
13b If Yes, in which fields?			
Agriculture Audiovisual and Media Budget Competition Consumers Culture Customs Development Economic and Monetary Affairs Education, Training, Youth Employment and Social Affairs	Energy Enlargement Enterprise Environment External Relations External Trade Fisheries and Maritime Affairs Food Safety Foreign and Security Policy Fraud Humanitarian aid	Human rights >>>Information Society Institutional affairs Internal Market Justice, freedom and security Public Health Regional Policy >>>Research and Innovation Space Taxation >>>Transport	

13c If Yes, at which level? <input type="radio"/> Local / regional levels <input type="radio"/> National level <input type="radio"/> European level <input checked="" type="radio"/> International level		
H Use and dissemination		
14. How many Articles were published/accepted for publication in peer-reviewed journals?	None, but one as a book chapter	
To how many of these is open access⁸ provided?		
How many of these are published in open access journals?		
How many of these are published in open repositories?		
To how many of these is open access not provided?		
Please check all applicable reasons for not providing open access:		
<input type="checkbox"/> publisher's licensing agreement would not permit publishing in a repository <input type="checkbox"/> no suitable repository available <input type="checkbox"/> no suitable open access journal available <input type="checkbox"/> no funds available to publish in an open access journal <input type="checkbox"/> lack of time and resources <input type="checkbox"/> lack of information on open access <input type="checkbox"/> other ⁹ :		
15. How many new patent applications ('priority filings') have been made? <i>("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).</i>	0	
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark	0
	Registered design	0
	Other	0
17. How many spin-off companies were created / are planned as a direct result of the project?	0	
<i>Indicate the approximate number of additional jobs in these companies:</i>		
18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project:		
<input type="checkbox"/> Increase in employment, or	<input type="checkbox"/> In small & medium-sized enterprises	
<input type="checkbox"/> Safeguard employment, or	<input type="checkbox"/> In large companies	

⁸ Open Access is defined as free of charge access for anyone via Internet.

⁹ For instance: classification for security project.

- 1.3 Chemical sciences (chemistry, other allied subjects)
- 1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)
- 1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2 ENGINEERING AND TECHNOLOGY

- 2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)
- 2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]
- 2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3 MEDICAL SCIENCES

- 3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immuno-haematology, clinical chemistry, clinical microbiology, pathology)
- 3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)
- 3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4 AGRICULTURAL SCIENCES

- 4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)
- 4.2 Veterinary medicine

5 SOCIAL SCIENCES

- 5.1 Psychology
- 5.2 Economics
- 5.3 Educational sciences (education and training and other allied subjects)
- 5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary, methodological and historical S1T activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6 HUMANITIES

- 6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)
- 6.2 Languages and literature (ancient and modern)
- 6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S1T activities relating to the subjects in this group]