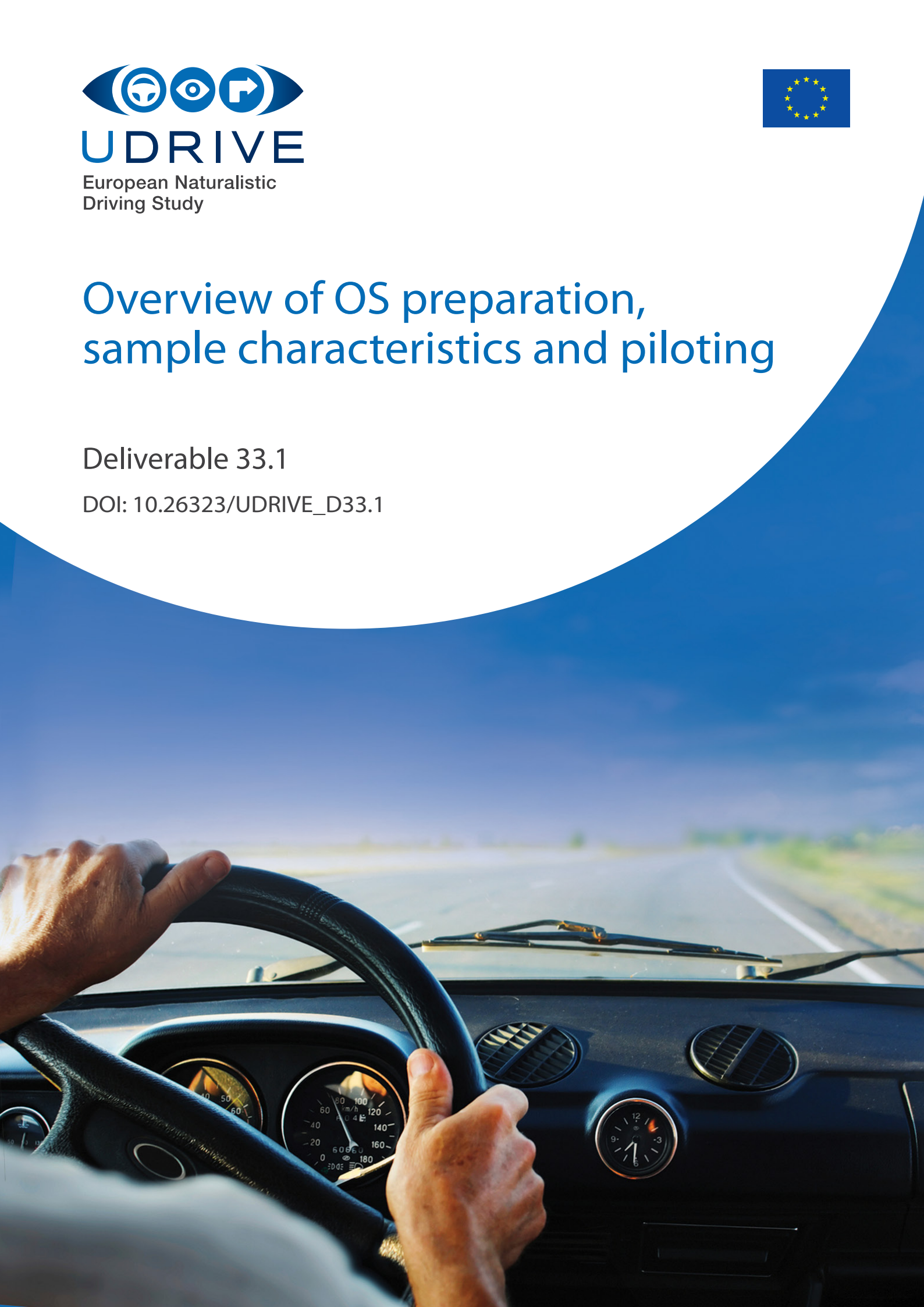
UDRIVE

European Naturalistic Driving Study

Overview of OS preparation, sample characteristics and piloting

Deliverable 33.1

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UDRIVE

European Naturalistic Driving Study

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SEVENTH FRAMEWORK PROGRAMME

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EXECUTIVE SUMMARY

The present document provides an overview of OS preparation for data collection, sample characteristics and pilot feedback in the context of the UDRIVE project.

UDRIVE aims to extract knowledge from collecting and then analysing millions of kilometres of everyday driving data. This document details feedback on pilot testing as well as in the data collection phase for all OSs combined.

This document presents the preparation for data collection for each OS, i.e. feedback, difficulties, and lessons learnt; all of this in terms of the interaction with the participants as well as in the technical aspects.

Details on recruitment; sample characteristics, and general feedback on data collection and data sharing are also covered in this document for each OS.

The document is structured as follows: firstly the prerequisites are specified for all Operation Sites in terms of logistics, documentation, and instrumentation; the purpose being to train the teams with less time pressure on the tasks they will perform. Secondly, the pilot test procedures to dictate the experimentation are detailed, which is followed by feedback on the pilot for each and every Operational Site within the experimentation. In the latter, feedback is reported through thorough checklists in all possible contexts of the trial and also through reporting of issues that may have occurred and lessons learnt.

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INTRODUCTION

Following all preliminary work performed in SP3 and the implementation and validation of the complete instrumentation equipment and configuration in SP2, each OS has to recruit the required participants, implement the necessary procedures to perform data collection, and validate that this implementation is operational before actual data collection.

This is carried out through a pilot where each Operation Site (OS) performs a small scale, but representative preliminary installation and data collection. The aim is to validate the complete instrumentation equipment and configuration (from participant and vehicle reception, Data Acquisition System installation to data collection) and the corresponding procedures in each OS specific context.

This preliminary study is divided in several successive steps. Each OS should not proceed to the next step before the previous one is fully validated. Moreover, pilot tests are to be done in the same way and under similar conditions as planned for the real data collection.

This document first summarizes the different operations which have to be performed, then reports on recruitment and piloting phases for each OS.

It is divided into three parts:

- **PREREQUISITES**

Before starting piloting, each OS has to check the following items in order to train themselves on identifying and solving potential problems. Only after such prerequisites are obtained, the pilot can start.

    - Operation Site responsabilities and teams are identified
    - Documents needed by the OS before the piloting are ready
    - Online Monitoring Tool is configured for the OS
    - Suitable suppliers have been selected for:
        - Data Acquisition System installation team
        - GSM data transfer (SIM cards)
        - Hard drives shipment to LDC
    - Pilot vehicle and participants are selected
    - Suitable facilities to receive participants are prepared

- **Description of PILOT TESTS PROCEDURES to be followed by the OS**
    - Registration of the participants
    - Reception of the vehicle and instrumentation by the DAS installation team
    - Online Monitoring Tool (OMT) connection
    - Data collection
    - Data quality check
    - Data transfer to LDC/CDC

- DAS removal by DAS installation team.

- **REPORT ON PILOT TESTING**
  - Each OS describes in its own section the results of the piloting, including feedback on the difficulties encountered, the solutions which were applied to solve each problem, and fills-in the checklist and tables which are given as guidance.

1 PREREQUISITES

1.1 Operation Site responsibilities and team identification

During the experiment, different tasks may be handled by several persons within the OS. It is therefore necessary to clearly define each person's responsibilities. This also means that each OS has to ensure that the responsibilities are distributed and understood by the concerned persons.

The responsibilities are defined as follows:

DESIGNATION	COMMENT
OS Legal responsible	He/she has to ensure that the OS has all legal authorizations to collect all the data (personal data, video data etc.). He/she has to ensure that the OS has implemented suitable tools and procedures to protect all collected and stored data from inappropriate use (driving data, subjective data, personal data).
OS Responsible	He/she manages data collection in an Operation Site.
OS Participants handling responsible	He/she manages participants' related aspects.
OS Data quality responsible	He/she is responsible for monitoring the quality of data collected in an OS.
OS Data pick-up and transfer manager	He/she is responsible for physically collecting data (hard drives) in participants' vehicles and transfers it to the OS then to the correct Local Data Centre (LDC). He/she is also responsible for transferring subjective data to the LDC.

1.2 OS Documents collection and adaptation

DESIGNATION	COMMENT	PROVIDED BY
Briefing presentation	Presentation to be made to each participant before they agree to participate to the study. It shall present: • The OS • The UDRIVE project • The overall organization of data collection • The vehicle instrumentation and the data it collects • The overall content of the questionnaires (topics addressed) • The legal and ethical framework • OS and participants engagements,	Implemented by OS

	rights and obligations. • The content of contractual documents • The organisation of the hotline • The incentives payment principle and organisation	
Questionnaires and test	Participant Questionnaires: paper version or electronic versions are implemented, and the instructions to apply the questionnaires to participants are specified. Coding scheme document: the answers from the questionnaires should be encoded using this document. Hazard Perception test (instructions for setting up and running the test)	UDRIVE SP1 and OS
Documents for participant handling	Participants agreements Covering specificities on the conditions of the experiment, the participant's rights, logistics, data protection issues, among others.	UDRIVE SP1
	Badge (suitable format is credit card format: 84 x 55 mm) containing: Hotline number Participant Unique ID: eg. UDRIVE_ FR_DRV200 Purpose: to provide the participant with the key information (in a practical format) in case they ever need to contact the OS.	Implemented by OS
	Hotline log A spreadsheet containing a log of **all** interactions with participants through the hotline: date of call, question/topic addressed, answers given, next call appointment, answer pending (yes/no), status of issue (open/closed), etc. This document must enforce a process where no question can remain unanswered or no issue	Implemented by OS

	pending, and must allow seamless rotation of hotline assignees.	
Guides	DAS[1] installation/uninstallation guides and data logger preparation procedures	UDRIVE SP2
Online Monitoring Tool (OMT) user manual	This user manual explains how to use the OMT (check the data quality and track the hard drives). Each OS has to ensure that the OMT main administrator creates a user account for the OS Data Quality Responsible before starting pilot tests.	UDRIVE SP2
QR Codes	QR codes are provided to each OS by SP2. They need to be printed out and glued on the corresponding vehicles, data loggers, HDDs. They are flashed using a smartphone during different operations (e.g. DAS installation, HDD exchange, etc.) in order to ensure their tracking. A first series of QR codes will be provided for pilot.	UDRIVE SP2, printed by OS.
Documents for vehicle handling	Vehicle condition report: this document is used to enter the vehicle condition (scuffs, dents, broken, cracked, etc.). It has to be signed both by the installation team and the vehicle owner when instrumentation is completed.	Implemented by the OS
	Instrumentation agreement: document stating that the owner agrees to get his/her vehicle instrumented. It has to be signed by him/her. Depending on each OS organisation, it might be merged with vehicle condition report or participant agreement.	Implemented by the OS
	Garage information notice: description of DAS for garage. It contains instructions on how to disconnect / reconnect the system from the vehicle, which might be necessary	UDRIVE SP2, translated by OS.

[1] Througout the report the term DAS (Data Acquisition System) denotes the entire system and relatedinstrumentation in order to collect data, whereas the term « data logger » denotes only the unit with the software and data storage mechanism allowing data collection. A DAS is then formed by a data logger and all possible insturmentation associated with it (e.g. cables and cameras, among others).

	for maintenance. It must be translated to the local language of each OS, and it must bear the telephone number of the corresponding installation team.	
Vehicle questionnaire	Vehicle questionnaire and instructions: paper version or electronic version of the questionnaire is implemented and instructions to apply such questionnaire are specified.	UDRIVE SP1, translated by OS.
Procedures to exchange the hard drives (HDD)	Guidelines to exchange the HDD in participants' vehicles.	UDRIVE SP2
The procedures to transfer hard drives	Procedures to transfer physically the HDD from participants' vehicles to OS and from OS to LDC.	UDRIVE SP3
Driver Unique ID	This ID will allow a badge to be created for each participant and will identify the participant in the OMT. The Dutch operation site should use the interval of 1-199 For the **Dutch** site: UDRIVE_NL_DRV001 … UDRIVE_NL_DRV199 The French operation site should use the interval of 200-399 For the **French** site: UDRIVE_FR_DRV200 UDRIVE_FR_DRV201 … UDRIVE_FR_DRV399 The German operation site should use the interval of 400-599 For the **German** site: UDRIVE_DE_DRV400 UDRIVE_DE_DRV401 …	UDRIVE SP4

	UDRIVE_DE_DRV599 The UK operation site should use the interval of 600-799 For the **UK** site: UDRIVE_UK_DRV600 UDRIVE_UK_DRV601 … UDRIVE_UK_DRV799 The Polish operation site should use the interval of 800-999 For the **Polish** site: UDRIVE_PL_DRV800 UDRIVE_PL_DRV801 … UDRIVE_PL_DRV999 The Austrian OS was supposed to use the interval of 1000-1199; however such site never became operational. The Spanish operation site should use the interval of 1200-1399 For the **Spanish** site: UDRIVE_ES_DRV1200 UDRIVE_ES_DRV1201 … UDRIVE_ES_DRV1399	
Driver coordinates and UID correspondence table	Correspondence between Unique ID and driver personal coordinates (address, phone number) is kept in this document. It is of paramount importance to ensure password protection of this document.	Implemented by the OS

1.3 Online Monitoring Tool OS setup

The Online Monitoring Tool allows centralized monitoring of the complete operations from each OS. Its server is hosted and operated by SAFER in Sweden. It gets status reports from data loggers though their GSM connection. OS teams interact with it either for tagging a specific operation (e.g. hard drive exchange) by flashing a QR code, or to get overview and details about their own operation site activity online.

As a result, before proceeding with pilot and then experiment, each OS needs to provide necessary information to SAFER, and in return receive:

- QR codes to be pasted on cars, data loggers and hard-drives
- Credentials to access the web interface.

1.4 External suppliers selection

1.4.1 Data Acquisition System installation team

Before starting DAS installation in vehicle:

- The OS has selected a suitable installation team, following the criteria provided by Vehicle Adaptation Team (SP2) and the installation team has been accepted by the corresponding DAS Vehicle Adaptation team (CEESAR for cars, TNO for trucks, CIDAUT for PTWs)
- The OS has controlled that the installation team has the necessary facilities and tools to properly instrument vehicles.
- The OS has controlled that the installation team is a Mobileye certified installer.
- The OS has controlled that the necessary documents and material will be provided to the installation team.

1.4.2 GSM provider

Each OS has to contract with a suitable telephone operator to provide **machine to machine communication** between the DAS and the Online Monitoring Tool. Each OS is responsible for managing data transfer and the associated costs, but given the overall budget, it is highly recommended to aim for a data plan which comprises around 500Mbytes/per month, with a **fixed** cost, which will cut communication instead of inducing any additional costs in case of overuse of data or international roaming.

Given the moving nature of the vehicles, the operator with the best coverage in the region of operation shall be favoured.

Also note that **a standard 'telephone' SIM card** won't likely allow more than Internet browsing and email, and as such won't be suitable for communication between the DAS and the OMT. **A 'machine to machine' card is required**.

It is also highly recommended to first obtain a free test SIM card for piloting before contracting.

1.4.3 HDD shipment company selection

A company has to be selected for shipping hard drives to the LDC. The best combination of quantity of hard drives per parcel vs. shipment frequency has to be chosen between OS and corresponding LDC, taking into account budget constraints.

Packaging must protect HDD from mechanical damage, but also from electromagnetic hazard: **each HDD must be protected in an antistatic sleeve before shipping.** As a result, it is the OS responsibility to purchase packaging items (e.g. sleeves) which suitably protect HDDs.

Shipping must be done **with tracking and signature upon reception**. LDC must receive an email with tracking number and the corresponding list of HDD identification numbers (e.g. hddfr001).

1.5 Pilot vehicle and participants

During piloting at least one vehicle must be installed following DAS installation procedures, used for a number of kilometres, then de-installed. It is recommended to use an OS owned, rented vehicle for the pilot testing or as a last option the vehicle of the participant recruited for the experiment.

Pilot tests will be carried out with one participant recruited to the experiment or with a pool of drivers who will not participate in the final experiment (volunteers can be recruited among e.g. colleagues, friends, etc.).

1.6 Suitable facilities

OS facilities must be organized in a way allowing:

- Briefing presentation (computer, beamer, white screen).
- Documents signing (table).
- Questionnaires and hazard perception test administration (table and / or computer).
- Identification picture taking (white wall, homogeneous light, digital camera, tripod, writing slate and marker).

Depending on each OS organization, an independent waiting room might be necessary.

2 PILOT TEST PROCEDURES

Once the prerequisites are obtained, the actual pilot can start. Its aim is to train the teams with less time pressure on the task that they will have to perform and to identify and solve all potentially remaining problems.

It consists of:

- Carrying out all OS operations **in the same way** as they will be during the experiment.
- Assessing that they are performed **in the right way** and **result in the expected outcome**.
- Giving **feedback on the problems** which have been encountered, finding solutions for those, and also reporting on those solutions in order to improve other OSes' or future projects' operations.

An overview of the operations is given in the schema on next page. This schema also represents the necessary interactions with SP2 partners. The corresponding contact information for each OS is given in the table below, however highlighting the fact that the Austrian OS was proposed at the beginning, but then removed from the study. Then, a summary of each main operation is given.

All details of the operations can be found either in the aforementioned documents (e.g. instruction manuals) and/or in the OS Use Cases which are given in annex.

<table>
<tr><td>Central Data Center</td><td colspan="7">SAFER
erik.svanberg@chalmers.se</td></tr>
<tr><td>Local Data Center</td><td colspan="3">CEESAR
clement.val@ceesar.fr</td><td colspan="2">DLR
chakajkla.jesdabodi@dlr.de</td><td colspan="2">VOLVO
andres.ac.carlsson@volvo.com</td></tr>
<tr><td>OS</td><td>UK</td><td>France</td><td>Spain</td><td>Germany</td><td>Poland</td><td>Netherlands</td><td>Netherlands 2</td></tr>
<tr><td>Vehicle Type</td><td>CARS</td><td>CARS</td><td>PTWs</td><td>CARS</td><td>CARS</td><td>TRUCKS</td><td>CARS</td></tr>
<tr><td>Vehicle Adaptation Team</td><td colspan="3">CIDAUT
oscmar@cidaut.es
CEESAR
lionel.boulommier@ceesar.fr</td><td colspan="2"></td><td colspan="2">TNO
rob.vandepijpekamp@tno.nl</td></tr>
<tr><td>Online Monitoring</td><td colspan="7">SAFER
riku@chalmers.se</td></tr>
</table>

Figure 1 OS, LCD, and CDC structure

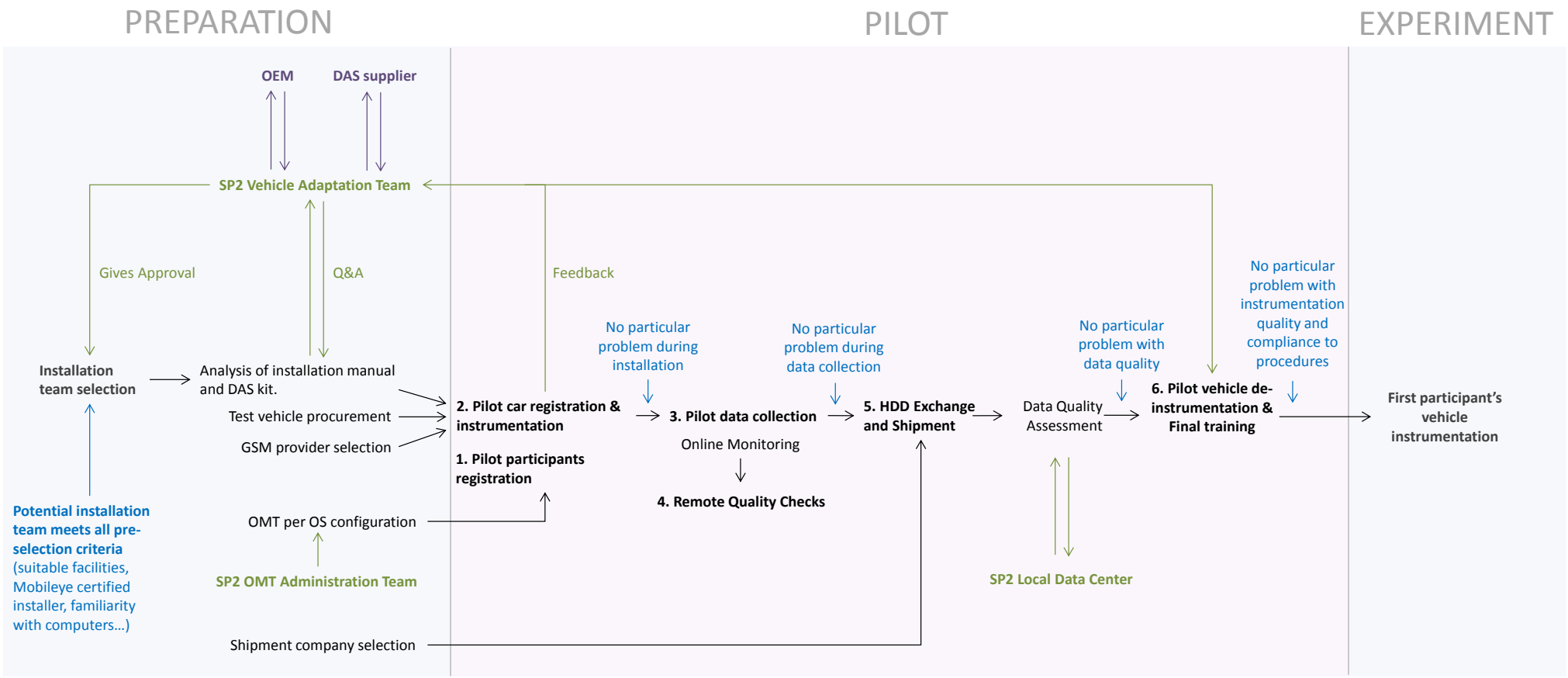


Figure 2 Piloting operations overview

2.1 Pilot participants registration, briefing and questionnaires

2.1.1 Actions to perform

- For each pilot participant:
  - Reception in the facilities which will be used for actual experiment.
  - Verification that they are eligible to participate in the experiment (e.g. driving licence).
  - Briefing using the aforementioned presentation.
  - Additional pilot specific briefing (e.g. logbook presentation, see 2.3 below).
  - (fake) Signature of participant agreement by OS legal responsible and participant. Note: although actual participant agreement only covers the actual experiment, pilot participants must be informed of and agree with the fact that the records made while they drive will be shared within UDRIVE consortium for piloting purpose.
  - Identification of vehicle(s) which might be driven by the participant.
  - Unique ID and corresponding participant badge creation.
  - Driver registration on the OMT following *"OMT user manual":*
    - Take face and profiles pictures (front, driver looking right and driver looking left) of the participant against white wall, holding a writing slate bearing his/her participant unique ID. The light must be homogenous, the frame must be vertical, and contain only the face and the slate, hold just under the chin.



Figure 3 Typical identification pictures

    - Upload the photos on the OMT following the procedures described in the "*OMT user manual"* (photos must be in either JPG or PNG format).

  - Questionnaires and hazard perception test administration following the instructions provided by SP1.

- Questionnaires and hazard perception test data transfer to CDC as electronic files. (The answers from the questionnaires should be encoded using the coding scheme before transfer to the CDC).

2.1.2 Verifications

- Assess overall suitability of the process, identify and solve difficulties
- Collect subjective impressions from participants on the overall process, presentation, contracts, questionnaires and hazard perception test.
- Get CDC feedback on identification picture quality. Make necessary improvement if asked for.
- Get CDC feedback on questionnaires and on hazard perception tests' electronic files quality.

2.2 Pilot vehicle registration and instrumentation

2.2.1 Actions to perform

- Vehicle registration on the OMT.
- Prepare the data logger following the *"Data logger preparation procedures"*
- Reception of the vehicle owner and their vehicle. (For piloting, a colleague can take the role of the vehicle owner, and give feedback from that perspective).
- Verification of the vehicle registration documents.
- Verification that the selected vehicle corresponds to the "*vehicle selection criteria*" provided by Vehicle Adaptation Team (SP2).
- If owner is not a participant, briefing (same presentation as participant briefing).
- Signature of the "*instrumentation agreement"* by the vehicle owner.
- Pilot vehicle condition observation, *"vehicle condition report"* filling and signature by installation team and vehicle owner (a copy is kept by both parties).
- Verification that entries corresponding to vehicle / DAS / first hard drive are present in OMT. Corresponding QR codes given to installation team.
- Collection of the vehicle variables using "*vehicle questionnaire*" document.
- Vehicle questionnaire data transfer to CDC as electronic files by the OS responsible.
- Vehicle instrumentation, following *"DAS installation guide".*
- Vehicle handover back to owner. Signature of a new "vehicle condition report" (no additional scratch or mark should be added by the instrumentation operation).

2.2.2 Verifications

- Collect subjective impressions from vehicle "owner" on the overall process, from his own perspective.
- Check that the vehicle was not damaged in any way by the instrumentation.
- Instrumentation debriefing: identify any problem that occurred during instrumentation. Give feedback to vehicle adaptation team and ask them for any necessary clarification. Solve any remaining difficulty.
- Get CDC feedback on the vehicle questionnaire electronic file quality.

2.3 Vehicle data collection

2.3.1 Actions to perform

Once the vehicle has been instrumented, pilot participants shall take turns to use it in varied situations (different kind of roads, night driving as well as day time driving, short trips, long trips, etc.).The pilot vehicle shall be used for at least **two weeks**, with a minimum of **40 different trips**, covering at least **1000 km**. The OS responsible shall ensure that the vehicle is used each and every day.

A logbook must be put in the vehicle and **systematically** filled by pilot participants for each and every trip.

An example of the information which shall be written down is given below:

UDRIVE PILOT

OS:	**VEHICLE UID:**	**DRIVER UID:**

Start of trip	Date:		Time:	
Address:				
End of trip	Date:		Time:	
Address:				

Datalogging relevant remarks:

Please note here any event which you think may have an impact on the DAS operation (e.g. engine stall). Also note here any imperfection you notice about the instrumentation (e.g. noise)

Road safety relevant remarks:

Please note here any event which you think might be interesting to detect and analyse from a road safety perspective

Information from the logbook has to be entered systematically in an Excel spreadsheet and sent to the LDC.

In addition to that, it is suggested for the pilot participants to contact the hotline whenever they have a question or remark. It should be avoided to have any “informal” contacts between OS team and pilot participants regarding the pilot experiment, as these are not representative of the actual

experiment, and would not leave any trace which can be used for reporting and later problem solving. Therefore, only the designated contact person in the OS should handle participants' concerns or questions and he or she should do so following the necessary protocols and keeping the necessary follow-up documentation.

All interactions through the hotline, including participants' questions and OS answers shall be logged in the actual hotline log.

2.3.2 Verifications

- Collect subjective impressions from pilot participants.
- After 2.5 (see below), and using the aforementioned spreadsheet, **systematically** check that **each and every** trip was correctly logged and pre-processed (criteria given in checklist below).
- The hotline could be reached whenever it was supposed to be accessible, and could address all pilot participants concerns with acceptable delay.

2.4 Remote quality check

2.4.1 Actions/checks to perform

During pilot data collection phase (2.3), the OS data quality responsible individual shall regularly connect to the Online Monitoring Tool and systematically check that:

- The data logger successfully connected to the OMT during each trip.
- A status report was generated and synchronized to the OMT for each trip.
- No status report shows any defect in the DAS operation.

2.5 HDD exchange and shipment to LDC

2.5.1 Actions to perform

The OS Data pick-up and transfer manager shall take care of this task. If he/she plans to rely on other people for some tasks during the experiment, the actual persons handling those tasks later shall take care of them during pilot.

- HDD preparation at the OS *"Procedures to exchange the hard drives"*
- HDD retrieval
    - Simulate an appointment with vehicle owner / pilot participant currently using the vehicle.
    - Turn off the vehicle, then remove the HDD from the data logger (see "*Procedures to exchange the hard drives*").
    - Follow the procedures defined in the "*OMT user manual*" to inform the OMT that the HDD was detached from the data logger and replaced by the new one.
    - Replace the new hard drive in the data logger following "*Procedures to exchange the hard drives*".
    - Give back the vehicle to the owner / pilot participant.

- HDD transfer to the OS
    - Follow the procedures defined in the "*OMT user manual* to inform the OMT that the HDD is sent to the OS.
    - Physically transport HDD from retrieval place to the OS (note: depending on OS, this might be the same place).
- HDD interim storage at the OS
    - Follow the procedures defined in the "*OMT user manual*" to inform the OMT that the HDD is received at the OS.
    - Store the HDD in the dedicated secured area.
- HDD transfer to LDC
    - Create a package containing and protecting the HDD.
    - Hand over the HDD to the shipping company and collect the corresponding tracking number
    - Follow the procedures defined in the "*OMT user manual*" to inform the OMT that the HDD is sent to the LDC.
    - Inform the LDC that a package was sent, with the corresponding tracking number.

2.6 Pilot vehicle de-instrumentation, participants debriefing, final installation team training

2.6.1 Actions to perform

The aim of this step is to simulate the end of the experiment.

- DAS removal
    - Reception of the vehicle owner and its vehicle.
    - Pilot vehicle condition observation, *"vehicle condition report"* filling and signature by installation team and vehicle owner (a copy is kept by both parties).
    - DAS removal, following *"DAS uninstallation guide".*
    - *"Garage information notice"* removal.
    - Vehicle handover back to owner. Signature of a new "vehicle condition report" (no additional scratch or mark should be added by the instrumentation operation).
- Pilot participants debriefing
    - Organise a meeting with all pilot participants to collect the subjective impressions on the complete pilot.
- Installation team debriefing
    - Meeting with vehicle adaptation team, to clarify any remaining doubt regarding DAS installation and removal.
    - Formal acceptance of installation team by vehicle adaptation team.

2.6.2 Verifications

- Check that de-instrumentation had absolutely no negative impact on the vehicle.

3 OS CHECKLIST AND PILOT FEEDBACK

The aim of this section is to allow each OS to:

- Give feedback on the recruitment process and describe the sample characteristics.
- Evaluate whether all preconditions necessary to start the experiment are met.
- Give feedback on the pilot, including problems which were encountered and the solutions which allowed solving them.

3.1 French OS

3.1.1 Feedback on recruitment

- Recruitment process reminder

The recruitment started in September 2015. Flyers were distributed in the Bron Area, to the companies in the vicinity of IFSTTAR's headquarters. Also, CEESAR hired the company managing the license plates database in France to contact drivers having recently acquired the vehicles of interest in the area of interest. They proceeded to send an official mail and a flyer to the drivers with the description of the study and the contact number (hotline) in case they were interested. The interested drivers then contacted us and we proceeded to filter them according to the study selection criteria.

- Difficulties and lessons learnt

- The main difficulty when recruiting participants was the duration of the study; namely, the ratio of monetary benefit / duration of the study.
- A secondary, yet important uncertainty for potential participants was the amount of instrumentation itself.
- When trying to recruit potential participants, great feedback was obtained when a large amount of details were given about the experimentation. Taking the time to explain what we would and would not be able to do with data gave great results since participants were more receptive.
- A lesson learnt is taking the time to thoroughly ask participants the preliminary information for recruitment (via phone). In some cases not all the information was provided since they would either be in a hurry or due to human induced error by the recruiters (forgetting to ask or document the answer to a particular question). This was the case for the mileage for example, the criteria was to take participants counting on doing a minimum mileage per year. This however did not reflect the actual mileage they estimated to do in a year. Some of these answers were gathered from the beginning and some others were gathered when meeting participants over hard drive exchanges so that we would not have to bother them if it was not needed.

- Resulting sample characteristics

			Target	Realized		
Vehicles			= 30	30		
Drivers			≥ 50	43		
Multi-drivers cars	22-65 y/o		≥ 12	13		
Mileage			≥ 10 000 km	Min	Median	Max
				6000	13000	30000
Gender / Age / Vehicle Type Matrix						
Male	22-65 y/o	Overall	≥ 15	20		
		Small cars	≥ 4	12		
		Mid-sized family cars	≥ 4	8		
Female	22-65 y/o	Overall	≥ 15	23		
		Small cars	≥ 4	13		
		Mid-sized family cars	≥ 4	10		

3.1.2 Operation Site responsible and teams designation and training

☒ **CHK_01_01.** All OS Task Responsibles are designed.

☒ **CHK_01_02.** Each OS Task Responsible:

☒ **CHK_01_02.a** has read the full use cases description of OS operations.

☒ **CHK_01_02.b** has read the documentation related to his/her task.

☒ **CHK_01_02.c** has trained his/her own team collaborating to the task he/she's responsible for.

☒ **CHK_01_02.d** is aware of his/her responsibilities.

	Name	Email address	Phone number
OS Legal responsible	Philippe Chrétien	philippe.chretien@ceesar.fr	+33(0)176873667
OS Operations responsible	Clément Val	clement.val@ceesar.fr	+33(0)176830490
OS Participants Handling responsible	Jean-Marc Bersac	Jean-marc.bersac@ceesar.fr	+33(0)176873503
OS Data Quality responsible	Clément Val	clement.val@ceesar.fr	+33(0)176830490
OS Data pick-up and transfer manager	Lionel Boulommier	lionel.boulommier@ceesar.fr	+33(0)176873540

3.1.3 Legal Authorizations

☒ **CHK_02_01.** OS has all legal authorizations to collect all personal data as defined in UDRIVE's study plan (including: biographic details, travels, driving behaviour...).

☒ **CHK_02_02.** OS is authorized to systematically record geolocalized / timestamped / video data of exterior scenes from instrumented vehicles in its country.

☒ **CHK_02_03.** OS is authorized to systematically record video data of vehicle's interior, including driver and passengers.

☒ **CHK_02_04.** OS has legal authorizations to transfer data which has to be transferred (OS to LDC and LCD to CDC)

☒ **CHK_02_05.** OS has the authorization from the UDRIVE Data protection certification organization.

3.1.4 Participants registration, hazard perception test and questionnaires

☒ **CHK_03_01.** OS has prepared a briefing presentation which presents:

- ☒ **CHK_03_01.a** The OS
- ☒ **CHK_03_01.b** The UDRIVE project
- ☒ **CHK_03_01.c** The overall organization of data collection
- ☒ **CHK_03_01.d** The vehicle instrumentation and the data it collects
- ☒ **CHK_03_01.e** The overall content of the questionnaires (topics addressed)
- ☒ **CHK_03_01.f** The legal and ethical framework
- ☒ **CHK_03_01.g** OS and Participants engagements, rights and obligations
- ☒ **CHK_03_01.h** The content of contractual documents
- ☒ **CHK_03_01.i** The organisation of the hotline
- ☒ **CHK_03_01.j** The incentives payment principle and organisation

☒ **CHK_03_02.** Remarks from pilot participants are taken into account in the final briefing presentation version. Answers to their most common questions are also integrated in the presentation.

☒ **CHK_03_03.** Participant agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_04.** Vehicle owner agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_05.** Participants' identification badges, bearing hotline contact information are ready.

☒ **CHK_03_06.** OS has suitable facilities for participants' registration and briefing.

- ☒ **CHK_03_06.a** OS can suitably host participants during initial briefing.
- ☒ **CHK_03_06.b** OS can suitably present them the briefing presentation.

☒ **CHK_03_07.** Dedicated room, equipment and team training allow suitable identification pictures to be taken.

☒ **CHK_03_08.** Questionnaires have been translated in local language and are implemented either as paper questionnaires which will be typed in electronic documents by OS teams, or directly as an electronic questionnaire (e.g. Limesurvey)

☒ **CHK_03_09.** Questionnaires encoded using the coding scheme document and delivered to the CDC.

☒ **CHK_03_10.** Questionnaires integrated at the CDC are complete and match pilot participants answers (no mix-up during conversion, translation…)

☒ **CHK_03_11.** Hazard perception test implemented following the instructions provided by SP1.

☒ **CHK_03_12.** Hazard perception tests delivered to the CDC have the right format.

Approval for OS to LDC transfer has been obtained. Approval for LDC to CDC transfer has been obtained, under 2 conditions: 1) anonymization of external camera data (selective blurring of pedestrians and licence plates), and 2) avoiding transfer of infraction-related data.

The participant questionnaires have been exported from LimeSurvey and transferred to the CDC. No feedback has been received from the CDC for such questionnaires, as well as for the hazard perception tests, in order to validate compliance.

The set of recruited participants accepted to join the study, except for one who did not show up to the proposed meeting. The same participant expressed his concerns regarding the schedule in order to do the hard drive exchanges during the study. Therefore, such participant had to be replaced by another one among the set of participants in the waiting list kept by CEESAR.

During the first week of instrumentation, certain problems were encountered in terms of the logistics of managing participants. Namely, we received several participants (main and secondary drivers) of 2 vehicles at the same time. As a result, 3 participants used a paper version of the questionnaires. These were afterwards recorded on LimeSurvey (participant FR DRV 207, 208, and 209). All other participants used the version on LimeSurvey.

- A great number of particpants found the questionnaires subjective and very long.

- More than half of the particpants filled the questionnaire without many comments. A third of the participants had very few comments and only some of the participants made lots of comments on the questionnaires.

- Many participants found that the question: “I can see how it would be interesting to marry someone from a foreign country” was strange and had nothing to do with the study.

- Some participants pointed out that certain questions were redundant.

- All main drivers took the “Hazard perception test”. No problems arose through this test.

- Around a third of the participants found that it was difficicult to evaluate the vehicle’s speed on the part next to the big right line. They thought the vehicle was going too fast.

3.1.5 Vehicle Instrumentation

The installations were undertaken by CEESAR (namely by Jean-Marc Bersac and Lionel Boulommier) and all installs were carried out in the IFSTTAR headquarter at Bron (Lyon Region), France. Jean-Marc Bersac (Jean-marc.bersac@ceesar.fr, +33(0)176873503) and Lionel Boulommier (lionel.boulommier@ceesar.fr, +33(0)176873540).

☒ **CHK_04_01.** Garage information notices have been translated to local language and are given to installation team.

☒ **CHK_04_02.** Vehicle questionnaire have been translated to local language and are given to installation team.

☒ **CHK_04_03.** Vehicle questionnaires delivered to the CDC have the right format.

☒ **CHK_04_04.** Installation team is a Mobileye certified installer.

☒ **CHK_04_05.** Installation team has all necessary tools and facilities for installing the DAS and calibrating the Mobileye system.

☒ **CHK_04_06.** Installation team has closely followed the installation manual during piloting.

☒ **CHK_04_07.** Absolutely no damage has occurred to the vehicle during the pilot instrumentation.

☐ **CHK_04_08.** No major difficulty was identified during pilot instrumentation.

☒ **CHK_04_09.** No instrumentation operation remained unclear after piloting.

☒ **CHK_04_10.** All instrumentation related operations were correctly logged in Online Monitoring Tool.

☒ **CHK_04_11.** Absolutely no traces of instrumentation remain after un-installation of the DAS.

☒ **CHK_04_12.** Installation team has signed a contract recognizing that they are fully responsible for any harm or damage resulting from them not following the provided guidelines and installation manuals.

☒ **CHK_04_13.** Vehicle adaptation team gave final approval on installation team selection.

- For the pilot, three different vehicles, types were instrumented: Clio III, Clio IV, and Megane III. Only the model Clio IV was equipped with the pre-series material matching the final equipment. The 2 other types were equipped with prototype material.
- The data logger rebooted sometimes with no apparent reason and the status report was not working properly.
- The software update arrived with a delay that did not allow us to perform many tests of the entire system. Also, software re-install lacked robustness and there were ghost partitions that needed to be removed from the compact flash.
- Series material and prototype material validated by SECTRONIC was not identical, hence, the problems encountered by the other OS.
- In the experimentation phase, instrumentation was heavy in terms of hours worked in the day, i.e. with an instrumentation team of 2 people, 2 UDRIVE vehicles were instrumented each day until

reaching our fleet target. This entailed human induced errors linked to logistics such as not filling the vehicle questionnaire at the moment, as well as the satisfaction form after instrumentation. This was however solved, the questionnaires were sent to the CDC and no incidents or damages arose when instrumenting the vehicles.

3.1.6 Vehicle Data collection and monitoring

More than 690 trips were made. In general, the piloting phase went smoothly. However, it must be pointed out that in some very specific cases, some issues arose related to missing signals, for example: lack of GPS or mobileye.

☒ **CHK_05_01.** **Each and every trip** (as declared in the pilot participants' logbook) was correctly logged:

- ☒ **CHK_05_01.a** Record folders created with correct date.
- ☒ **CHK_05_01.b** Can be decoded and visualized.
- ☐ **CHK_05_01.c** All signals and video streams are present.
- ☒ **CHK_05_01.d** No incoherence between signals is apparent (e.g. vehicle speed <> GPS Speed, Steering wheel <> lateral acceleration…)
- ☒ **CHK_05_01.e** No synchronization problem can be observed (e.g. feet video channel <> brake pedal signal…)
- ☒ **CHK_05_01.f** Data acquisition didn't end while the vehicle was moving.
- ☒ **CHK_05_01.g** GPS starts shortly after declared start of trip location, GPS ends precisely at declared end of trip location.

☒ **CHK_05_02.** The data logger successfully connected to the OMT during each trip.

☒ **CHK_05_03.** A status report was generated and synchronized to the OMT for each trip.

☒ **CHK_05_04.** No status report shows any defect in the DAS operation.

☒ **CHK_05_05.** Pilot participants didn't observe any strange behaviour of the vehicle or complained about the instrumentation.

3.1.7 Participants support

Participants were essentially colleagues and therefore the interaction was quite dynamic.

☒ **CHK_06_01.** A hotline log has been created.

☒ **CHK_06_02.** Hotline could be reached whenever it was supposed to be available.

☒ **CHK_06_03.** Pilot participants were called back with acceptable delay when they left a message.

☒ **CHK_06_04.** All issues raised by pilot participants were solved.

☒ **CHK_06_05.** OS is ready to deal with unexpected events related to participants (vehicle dropout or driver exclusion).

3.1.8 Hard drive exchange

During the piloting phase 3 vehicles were used and 4 hard drives were available. For one of the vehicles, the hard drive was exchanged and for the other 2 the respective hard drives were reformatted. No problem arose during the hard drive exchanges.

☒ **CHK_07_01.** Hard-drive and hard drive tray were not damaged during hard drive exchange.

☒ **CHK_07_02.** New hard-drive was properly recognized by DAS after hard-drive exchange.

☒ **CHK_07_03.** Hard-drive exchange operations were properly logged in Online Monitoring Tool.

3.1.9 Local data storage

Hard drives, as well as participants' contracts and personal data are locked in a safe in a room with restricted access. Furthermore, vehicle data (hard drives) and participants' personal data are accessible by different people in order to ensure privacy as required.

☒ **CHK_06_01.** OS has implemented suitable tools and procedures to protect all collected and stored data from inappropriate use (DrivingData, SubjectiveData, Personal data)

☒ **CHK_06_01.a** OS has set-up a suitable premises (restricted area) to store vehicles and participants related data (HDD, participants contracts, personal data ...), so that each type of data is only accessible to personals who have the corresponding credentials

☒ **CHK_06_01.b** OS has designated authorized personals for accessing each type of data

Data Type	Protection measures (physical storage / IT protection)	Access Authorized to (names)
Vehicle data HDD	Locked in safe in restricted access room	Clément Val Fabien Croes Lionel Boulommier
Participant contracts	Locked in safe in restricted access room	Jean Marc Bersac
Participants personal data	Locked in safe in restricted access room	Jean Marc Bersac

3.2 United Kingdom OS

The UK OS is managed in 2 locations, Loughborough and Leeds. Both sites operate to the same processes. The pilot was undertaken at Loughborough and hence this section relates directly to the Loughborough Site. The sample statitsics are povided for the UK OS as a whole.

3.2.1 Feedback on recruitment

- Recruitment process reminder

The recruitment phase for the OS at Loughborough began in May 2014. The approach taken was to place a flyer on the windscreen of suitable vehicles, outlining the project and directing the driver towards a website with an online screening questionnaire. Additionally, flyers were left with local Renault Dealers to attract the attention of Renault owners.

- Difficulties and lessons learnt

By October 2014, in the region of 24 potential participants had been identified within the vicinity of Loughborough, but the respondents were informed of delays to the project and we were not able to continue to sign up for participation at that point in time. A pilot participant (a member of staff at the university) was identified and kept briefed of the expected project timeline in regards of piloting. Once Homologation had been obtained, the pilot participant's vehicle was immediately ready for instrumentation. However, some of the original potential drivers had lost interest and so a further recruitment effort (using the same method as previously) was required in order to meet the required number of vehicles.

The respondents drove predominantly a Renault Clio III and so it was not possible to meet the vehicle demographics laid out in the sampling plan. This is thought to be due to the nature of the Renault fleet in the UK where it is typically driven by a female as the second vehicle in a household.

In order to meet the deadline imposed for having all of the vehicles operational by the end of June 2015, anyone who fell within the required age category and drove close to the required annual mileage was invited to a presentation evening. Considering just primary drivers, the targets for the split by vehicle type and driver gender were not met at Loughborough. However, by including secondary drivers the minima required were met.

- Resulting sample characteristics, UK OS (Loughborough and Leeds)

			Target	Realized		
Vehicles			= 30	30		
Drivers			≥ 50	53		
Multi-drivers cars	22-65 y/o		≥ 12	18		
Mileage			≥ 10 000 km	Min	Median	Max
				8,000	16,000	32,000
Gender / Age / Vehicle Type Matrix						
Male	22-65 y/o	Overall	≥ 15	25		
		Small cars	≥ 4	18		
		Mid-sized family cars	≥ 4	7		
Female	22-65 y/o	Overall	≥ 15	28		
		Small cars	≥ 4	22		
		Mid-sized family cars	≥ 4	6		

3.2.2 Operation Site responsible and teams designation and training

☒ **CHK_01_01.** All OS Task Responsibles are designed.

☒ **CHK_01_02.** Each OS Task Responsible:

☒ **CHK_01_02.a** has read the full use cases description of OS operations.

☒ **CHK_01_02.b** has read the documentation related to his/her task.

☒ **CHK_01_02.c** has trained his/her own team collaborating to the task he/she's responsible for.

☒ **CHK_01_02.d** is aware of his/her responsibilities.

	Name	Email address	Phone number
OS Legal responsible	Ruth Welsh	r.h.welsh@lboro.ac.uk	+44 (0)1509226937
OS Operations responsible	Ruth Welsh	r.h.welsh@lboro.ac.uk	+44 (0)1509226937
OS Participants Handling responsible	Martyn Chambers Smith / Ruth Welsh	m.chambers-smith@lboro.ac.uk r.h.welsh@lboro.ac.uk	+44(0)1509226945 +44(0)1509226937
OS Data Quality responsible	Ruth Welsh	r.h.welsh@lboro.ac.uk	+44 (0)1509226937
OS Data pick-up and transfer manager	Martyn Chambers Smith / Ruth Welsh	m.chambers-smith@lboro.ac.uk r.h.welsh@lboro.ac.uk	+44(0)1509226945 +44(0)1509226937

3.2.3 Legal Authorizations

☒ **CHK_02_01.** OS has all legal authorizations to collect all personal data as defined in UDRIVE's study plan (including: biographic details, travels, driving behaviour...).

☒ **CHK_02_02.** OS is authorized to systematically record geolocalized / timestamped / video data of exterior scenes from instrumented vehicles in its country.

☒ **CHK_02_03.** OS is authorized to systematically record video data of vehicle's interior, including driver and passengers.

☒ **CHK_02_04.** OS has legal authorizations to transfer data which has to be transferred (OS to LDC and LCD to CDC)

☒ **CHK_02_05.** OS has the authorization from the UDRIVE Data protection certification organization

3.2.4 Participants registration, hazard perception test and questionnaires

☒ **CHK_03_01.** OS has prepared a briefing presentation which presents:

- ☒ **CHK_03_01.a** The OS
- ☒ **CHK_03_01.b** The UDRIVE project
- ☒ **CHK_03_01.c** The overall organization of data collection
- ☒ **CHK_03_01.d** The vehicle instrumentation and the data it collects
- ☒ **CHK_03_01.e** The overall content of the questionnaires (topics addressed)
- ☒ **CHK_03_01.f** The legal and ethical framework
- ☒ **CHK_03_01.g** OS and Participants engagements, rights and obligations
- ☒ **CHK_03_01.h** The content of contractual documents
- ☒ **CHK_03_01.i** The organisation of the hotline
- ☒ **CHK_03_01.j** The incentives payment principle and organisation

☒ **CHK_03_02.** Remarks from pilot participants are taken into account in the final briefing presentation version. Answers to their most common questions are also integrated in the presentation.

☒ **CHK_03_03.** Participant agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_04.** Vehicle owner agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_05.** Participants' identification badges, bearing hotline contact information are ready.

☒ **CHK_03_06.** OS has suitable facilities for participants' registration and briefing.

- ☒ **CHK_03_06.a** OS can suitably host participants during initial briefing.
- ☒ **CHK_03_06.b** OS can suitably present them the briefing presentation.

☒ **CHK_03_07.** Dedicated room, equipment and team training allow suitable identification pictures to be taken.

☒ **CHK_03_08.** Questionnaires have been translated in local language and are implemented either as paper questionnaires which will be typed in electronic documents by OS teams, or directly as an electronic questionnaire (e.g. Limesurvey).

☒ **CHK_03_09.** Questionnaires encoded using the coding scheme document and delivered to the CDC.

☐ **CHK_03_10.** Questionnaires integrated at the CDC are complete and match pilot participants answers (no mix-up during conversion, translation…)

☐ **CHK_03_11.** Hazard perception test implemented following the instructions provided by SP1.

☐ **CHK_03_12.** Hazard perception tests delivered to the CDC have the right format.

The questionnaire data from the pilot participant has been delivered to the LDC. The remaining 25 questionnaires will be available and sent to the LDC on 03/07/15.

The participant registrations (pilot and actual) went very smoothly. The main questions raised were about insurance and ownership of the data in the event of an accident. These were explained to the participants thus according to the project guidance.

The pilot of the HP test was not successful. Several people with the university attempted the test and found it to be confusing primarily since the test operates a LH drive vehicle and road infrastructure whereas vehicle in the UK are RH drive. As discussed at the joint SP2/SP3 meeting (March 2015) it was decided at Loughborough that we would not undertake this test with our participants at the time of registration, but they are aware that they may be asked to complete the test at a later date should SP4 consider it essential.

Some of the questions on the questionnaires were considered a little confusing, for example, if you state that you have no automatic headlights, then it makes no sense to then be asked how frequently you turn the function off. Participants were guided to respond ‘n/a’ (not applicable) in this instance. The coding used will be explained to the LDC when the excel file with the responses is sent.

3.2.5 Vehicle Instrumentation

The installations were undertaken by ARKFleetech and all installs were carried out in a vehicle LAB within the Design School at Loughborough University.

☒ **CHK_04_01.** Garage information notices have been translated to local language and are given to installation team.

☒ **CHK_04_02.** Vehicle questionnaire have been translated to local language and are given to installation team.

☐ **CHK_04_03.** Vehicle questionnaires delivered to the CDC have the right format.

☒ **CHK_04_04.** Installation team is a Mobileye certified installer.

☒ **CHK_04_05.** Installation team has all necessary tools and facilities for installing the DAS and calibrating the Mobileye system.

☒ **CHK_04_06.** Installation team has closely followed the installation manual during piloting.

☒ **CHK_04_07.** Absolutely no damage has occurred to the vehicle during the pilot instrumentation.

☐ **CHK_04_08.** No major difficulty was identified during pilot instrumentation

☒ **CHK_04_09.** No instrumentation operation remained unclear after piloting

☒ **CHK_04_10.** All instrumentation related operations were correctly logged in Online Monitoring Tool.

☒ **CHK_04_11.** Absolutely no traces of instrumentation remain after un-installation of the DAS.

☒ **CHK_04_12.** Installation team has signed a contract recognizing that they are fully responsible for any harm or damage resulting from them not following the provided guidelines and installation manuals.

☒ **CHK_04_13.** Vehicle adaptation team gave final approval on installation team selection.

In terms of the installation, there were issues with the labelling of the cables in the production DAS which were incorrect and meant that if the instruction (which were correct) were followed then the install was not successful.

Vehicle questionnaires are in the process of being completed, all questionnaires will be sent to the LDC in the next couple of weeks (by mid-July 2015).

3.2.6 Vehicle Data collection and monitoring

More than 15 thousand UK records have been recently pre-processed by CEESAR. Pilot data is included in this batch and the overview of the records that were verified indicate that data is valid.

☐ **CHK_05_01.** **Each and every trip** (as declared in the pilot participants' logbook) was correctly logged:

- ☒ **CHK_05_01.a** Record folders created with correct date.
- ☒ **CHK_05_01.b** Can be decoded and visualized.
- ☒ **CHK_05_01.c** All signals and video streams are present.
- ☒ **CHK_05_01.d** No incoherence between signals is apparent (e.g. vehicle speed <> GPS Speed, Steering wheel <> lateral acceleration…)
- ☒ **CHK_05_01.e** No synchronization problem can be observed (e.g. feet video channel <> brake pedal signal…)
- ☒ **CHK_05_01.f** Data acquisition didn't end while the vehicle was moving.
- ☒ **CHK_05_01.g** GPS starts shortly after declared start of trip location, GPS ends precisely at declared end of trip location.

☒ **CHK_05_02.** The data logger successfully connected to the OMT during each trip.

☒ **CHK_05_03.** A status report was generated and synchronized to the OMT for each trip.

☐ **CHK_05_04.** No status report shows any defect in the DAS operation.

☐ **CHK_05_05.** Pilot participants didn't observe any strange behaviour of the vehicle or complained about the instrumentation.

Given the amount of pre-processed records, not each trip could be verified. However, the overall results are positive.

The driver action camera which is located on the interior mirror persistently comes unstuck and drops down. This is due to the camera becoming hot and the type of surface it has been adhered to. This has been reported to SP2.

The status reports in the OMT showed a consistent pattern of a short duration (20 second) corrupt trip followed by what appears to be the actual trip for each trip. Snap shots were very infrequent. The DAS was later reconfigured using a new CF card and this rectified these issues.

There were issues with the labelling of cables. The first install attempt was made using the 'training DAS' from October 2014, which has different access port to the main production DAS. This was not made apparent before the pilot so a second attempt was required. Small amendments were required to the camera setting guide in order to clarify the location of the required software. The actual configuration of the DAS was difficult since it would not execute the fixbat successfully for some CF cards. It was later learnt that ghost partitions were present on some cards which needed removing before the card is flashed. Checking this became part of the procedure for the subsequent installs.

3.2.7 Participants support

☒ **CHK_06_01.** A hotline log has been created.

☒ **CHK_06_02.** Hotline could be reached whenever it was supposed to be available.

☒ **CHK_06_03.** Pilot participants were called back with acceptable delay when they left a message.

☒ **CHK_06_04.** All issues raised by pilot participants were solved.

☒ **CHK_06_05.** OS is ready to deal with unexpected events related to participants (vehicle dropout or driver exclusion).

3.2.8 Hard drive exchange

☒ **CHK_07_01.** Hard-drive and hard drive tray were not damaged during hard drive exchange.

☐ **CHK_07_02.** New hard-drive was properly recognized by DAS after hard-drive exchange.

☒ **CHK_07_03.** Hard-drive exchange operations were properly logged in Online Monitoring Tool.

The exchange HDD have not been delivered in the correct format and so do not record. The OMT does not give the %free or the health of the HDD for exchanged HDD. A solution is still needed (as of 01/07/15)

3.2.9 Local data storage

☒ **CHK_06_01.** OS has implemented suitable tools and procedures to protect all collected and stored data from inappropriate use (DrivingData, SubjectiveData, Personal data)

☒ **CHK_06_01.a** OS has set-up a suitable premises (restricted area) to store vehicles and participants related data (HDD, participants contracts, personal data ...), so that each type of data is only accessible to personals who have the corresponding credentials

☒ **CHK_06_01.b** OS has designated authorized personals for accessing each type of data

Data Type	Protection measures (physical storage / IT protection)	Access Authorized to (names)
Vehicle data HDD	Locked in safe in restricted access room	Martyn Chambers-Smith Ruth Welsh
Participant contracts	Locked in safe in restricted access room	Martyn Chambers-Smith Ruth Welsh
Participants personal data	Locked in safe in restricted access room / stored on restricted access drive on university server	Martyn Chambers-Smith Ruth Welsh

3.3 German OS

3.3.1 Feedback on recruitment

- Recruitment process reminder

Different channels for participant recruitment were used. The goal was to reach as many participants as possible to make sure that we had 30 participants at the end. As a first step for recruitment, an internal UDRIVE website was implemented on the DLR webpage (see: http://www.dlr.de/ts/udrive). Then, the printed versions of the project's Leaflets were ordered from ERTICO. To reach as many Renault drivers as possible, the following recruitment channels were used:

- search volunteer drivers on DLR own database;
- contact two Renault dealerships in Braunschweig;
- publish an advertisement in newspapers;
- contact online Forums for Renault drivers;
- contact car registry office in Braunschweig for information on Renault drivers;
- conduct a radio interview at Okerwelle and NDR;
- put information about the project on DLR Facebook;
- use help from FIA to contact ADAC in Germany;
- contact Renault dealerships in cities near Braunschweig;
- Put flyers in local supermarkets;
- send email to all employees at DLR institutes in Braunschweig, Berlin and Göttingen

Most of the interested drivers were recruited through the Renault dealerships. This is because one of the dealership offered us to send project's leaflets to all customers who have the suitable Renault vehicle models for UDRIVE. Also some drivers were sourced from advertisements in newspapers; while the remaining drivers were sourced from social media. Although the advertisement on the newspaper was very successful, it didn't attract the right vehicle drivers. The other recruitment channels were not successful.

- Difficulties and lessons learnt

Based on the German OS site experience, the following difficulties were encountered:

- defining the starting point of data collection at the beginning of the recruitment;
- finding young drivers interested in the study;
- not having a specific date for starting data collection made it difficult to keep contact with interested drivers as well as recruiting new drivers;
- there were few drivers who have Renault vehicles in the area of Braunschweig since Renault are not the common driven vehicles;

Lesson learnt:

- many drivers were interested into the project, but they didn't have the needed vehicle type;
- in future study it will be better to focus on vehicle types that are common in the study region. This, however, might require more investment in getting homologation from different car manufactures. An alternative would be to lease the appropriate vehicles and give them to the drivers.
- to recruit young participants, it is better to offer leasing vehicles.

- Resulting sample characteristics

			Target	**Realized**		
Vehicles			= 20	19		
Drivers			≥ 28	28		
Multi-drivers cars	22-65 y/o		≥ 8	7		
Mileage			≥ 10 000 km	Min	Median	Max
				2,600	7,280	46,800
Gender / Age / Vehicle Type Matrix						
Male	22-65 y/o	Overall	≥ 10	17		
		Small cars	≥ 3	7		
		Mid-sized family cars	≥ 3	10		
Female	22-65 y/o	Overall	≥ 10	9		
		Small cars	≥ 3	5		
		Mid-sized family cars	≥ 3	4		

3.3.2 Operation Site responsible and teams designation and training

☒ **CHK_01_01.** All OS Task Responsibles are designed.

☒ **CHK_01_02.** Each OS Task Responsible:

- ☒ **CHK_01_02.a** has read the full use cases description of OS operations.
- ☒ **CHK_01_02.b** has read the documentation related to his/her task.
- ☒ **CHK_01_02.c** has trained his/her own team collaborating to the task he/she's responsible for.
- ☒ **CHK_01_02.d** is aware of his/her responsibilities.

	Name	Email address	Phone number
OS Legal responsible	Sebastian Dominitzki	Sebastian.Dominitzki@dlr.de	+49(0)5312952094
OS Operations responsible	Mohamed Mahmod	mohamed.mahmod@dlr.de	+49(0)5312953466
OS Participants Handling responsible	Daniel Waigand	Daniel.Waigand@dlr.de	+49(0)5312953415
OS Data Quality responsible	Daniel Waigand	Daniel.Waigand@dlr.de	+49(0)5312953415
OS Data pick-up and transfer manager	Mohamed Mahmod	mohamed.mahmod@dlr.de	+49(0)5312953466

3.3.3 Legal Authorizations

☒ **CHK_02_01.** OS has all legal authorizations to collect all personal data as defined in UDRIVE's study plan (including: biographic details, travels, driving behaviour...).

☒ **CHK_02_02.** OS is authorized to systematically record geolocalized / timestamped / video data of exterior scenes from instrumented vehicles in its country.

☒ **CHK_02_03.** OS is authorized to systematically record video data of vehicle's interior, including driver and passengers.

☒ **CHK_02_04.** OS has legal authorizations to transfer data which has to be transferred (OS to LDC and LCD to CDC)

☒ **CHK_02_05.** OS has the authorization from the UDRIVE Data protection certification organization.

3.3.4 Participants registration, hazard perception test and questionnaires

☒ **CHK_03_01.** OS has prepared a briefing presentation which presents:

- ☒ **CHK_03_01.a** The OS
- ☒ **CHK_03_01.b** The UDRIVE project
- ☒ **CHK_03_01.c** The overall organization of data collection
- ☒ **CHK_03_01.d** The vehicle instrumentation and the data it collects

☒ **CHK_03_01.e** The overall content of the questionnaires (topics addressed)

☒ **CHK_03_01.f** The legal and ethical framework

☒ **CHK_03_01.g** OS and Participants engagements, rights and obligations

☒ **CHK_03_01.h** The content of contractual documents

☒ **CHK_03_01.i** The organisation of the hotline

☒ **CHK_03_01.j** The incentives payment principle and organisation

☒ **CHK_03_02.** Remarks from pilot participants are taken into account in the final briefing presentation version. Answers to their most common questions are also integrated in the presentation.

☒ **CHK_03_03.** Participant agreement in local language is ready. Corrections following pilot participants remarks have been done.

☐ **CHK_03_04.** Vehicle owner agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_05.** Participants' identification badges, bearing hotline contact information are ready.

☒ **CHK_03_06.** OS has suitable facilities for participants' registration and briefing.

☒ **CHK_03_06.a** OS can suitably host participants during initial briefing.

☒ **CHK_03_06.b** OS can suitably present them the briefing presentation.

☒ **CHK_03_07.** Dedicated room, equipment and team training allow suitable identification pictures to be taken.

☒ **CHK_03_08.** Questionnaires have been translated in local language and are implemented either as paper questionnaires which will be typed in electronic documents by OS teams, or directly as an electronic questionnaire (e.g. Limesurvey)

☒ **CHK_03_09.** Questionnaires encoded using the coding scheme document and delivered to the CDC.

☒ **CHK_03_10.** Questionnaires integrated at the CDC are complete and match pilot participants answers (no mix-up during conversion, translation…)

☒ **CHK_03_11.** Hazard perception test implemented following the instructions provided by SP1.

☒ **CHK_03_12.** Hazard perception tests delivered to the CDC have the right format.

At the German OS, the pilot only includes participants with their own vehicles.

Two versions of the questionnaire were used, namely online version (using SoSciSurvey tool) and paper version. Although participants have faced some difficulties, all questions were answered. During the first briefing sessions, the following feedback/comments were received from some of the participants:

- generally the subjective data questionnaire is very long and contains many questions;

- some of the questions are similar, for example the question “I would be happier if close-following regulations were more strictly applied” has the same meaning as the question “harsher penalties should be introduced for drivers who drive too close to the car in front”;
- sometimes the options to choose (i.e. never, hardly ever) are confusing and not consistent throughout the questionnaire. For example, the difference between “quite frequently” and “frequently” in German is not clear;
- some of the questions are strange, for example: “I can see how it would be interesting to marry someone from a foreign country” since it does not have a relation with driving.
-

Difficulties:

- during the first session we used tablets for filling the questionnaire but some of the participants found it too small and the touch screen didn’t recognise the touch input. Therefore we switched to laptops and in one case even used a paper version;

Lessons learnt:

- even if an online version of the questionnaire is used, it is better to have a paper version available as some of the participants might not be able to use computer-based version (e.g. elderly people) or might not have enough time to fill it at the briefing meeting.
- the questionnaire can be given on a laptop/computer or tablet, but it has to be taken into account that the text is big enough to read especially for elderly participants;
- if tablets are used, it is better to check that the touchscreen works fine since some tablets do not recognise touch inputs correctly;

Regarding the hazard perception test, it was installed in a laptop and explained to the participants after the briefing session. In general the test takes a few minutes to complete and no critical problem was encountered. The minor difficulties which were faced are mentioned below together with the lessons learnt from them.

Difficulties include:

- at the start of the test, some participants thought that they are driving the car that is in front of them, but after explanation it was ok;
- one participant continued pressing the space bar most of the time or very frequently;

Lessons learnt include:

- if multiple participants are taking the test at the same time, it is better to have multiple laptops to avoid that some of the participants have to wait;
- during the test, it should be checked that the participant do not hold the space bar continuously.

3.3.5 Vehicle Instrumentation

The German OS has signed a contract with Dr. Schmid GmbH Bosch Car Service garage in Braunschweig. The installation team consists of two technicians who have taken the Mobileye online certification test and passed it. The technicians have also participated in a two days training offered by experts from CEESAR. The main contact person at the Bosch garage is: Mr. Sebastian Suska, Phone: +49(0)531580070, e-mail: Suska@Bosch-Service-Braunschweig.de.

☒ **CHK_04_01.** Garage information notices have been translated to local language and are given to installation team.

☒ **CHK_04_02.** Vehicle questionnaire have been translated to local language and are given to installation team.

☐ **CHK_04_03.** Vehicle questionnaires delivered to the CDC have the right format.

☒ **CHK_04_04.** Installation team is a Mobileye certified installer.

☒ **CHK_04_05.** Installation team has all necessary tools and facilities for installing the DAS and calibrating the Mobileye system.

☒ **CHK_04_06.** Installation team has closely followed the installation manual during piloting.

☒ **CHK_04_07.** Absolutely no damage has occurred to the vehicle during the pilot instrumentation.

☐ **CHK_04_08.** No major difficulty was identified during pilot instrumentation

☒ **CHK_04_09.** No instrumentation operation remained unclear after piloting

☒ **CHK_04_10.** All instrumentation related operations were correctly logged in Online Monitoring Tool.

☐ **CHK_04_11.** Absolutely no traces of instrumentation remain after un-installation of the DAS.

☒ **CHK_04_12.** Installation team has signed a contract recognizing that they are fully responsible for any harm or damage resulting from them not following the provided guidelines and installation manuals.

☒ **CHK_04_13.** Vehicle adaptation team gave final approval on installation team selection.

A vehicle of a real participant was used for the piloting phase. The vehicle was a Clio III. The installation took longer than expected. In total four appointments were needed to finish the installation. Piloting was officially started on May 13th 2015 and ended on July 7th 2015. Uninstallation of the DAS was not conducted as it was decided that our piloting participant will continue with the real data collection.

As LDC we didn't deliver the vehicle questionnaire to someone else, but the questionnaire have the right format.

The main difficulties encountered during the pilot are:

- during the first appointment, all cameras and cables were installed except for the data logger and the Mobileye camera. The data logger was not prepared due to missing of lab power cable.

- during the second appointment, the data logger was prepared and installed. However, Mobileye database update took longer than expected and the time was not enough to finish the calibration of Mobileye;
- during the third appointment, the Mobileye software was not able to read system information of the Mobileye. This is because the new EyeCan cable received from SECTRONIC had a problem with its CAN connector. First, the CAN connector was not a standard CAN connector (i.e. bin 1 needed to be changed to bin 7). Second, a mini gender connector was needed to connect EyeCan cable to the CAN N=5B cable. Another difficulty which was faced here is that THE blue and red part of the CAN N=5B cable was labelled incorrectly.
- during the fourth appointment, the installation was finished swapping the blue and red cable in a plug.

3.3.6 Vehicle Data collection and monitoring

Only one vehicle with one participant was used for piloting at the German OS. The piloting was conducted between May 13th and July 7th. This includes around 54 days during which more than 100 trips were completed.

☐ **CHK_05_01. Each and every trip** (as declared in the pilot participants' logbook) was correctly logged:

- ☐ **CHK_05_01.a** Record folders created with correct date.
- ☐ **CHK_05_01.b** Can be decoded and visualized.
- ☐ **CHK_05_01.c** All signals and video streams are present.
- ☒ **CHK_05_01.d** No incoherence between signals is apparent (e.g. vehicle speed <> GPS Speed, Steering wheel <> lateral acceleration…)
- ☒ **CHK_05_01.e** No synchronization problem can be observed (e.g. feet video channel <> brake pedal signal…)
- ☒ **CHK_05_01.f** Data acquisition didn't end while the vehicle was moving.
- ☒ **CHK_05_01.g** GPS starts shortly after declared start of trip location, GPS ends precisely at declared end of trip location.

☒ **CHK_05_02.** The data logger successfully connected to the OMT during each trip.

☒ **CHK_05_03.** A status report was generated and synchronized to the OMT for each trip.

☒ **CHK_05_04.** No status report shows any defect in the DAS operation.

☒ **CHK_05_05.** Pilot participants didn't observe any strange behaviour of the vehicle or complained about the instrumentation.

The date for the trips in the logbook are always four hours ahead from the date recorded on the OMT or record folders in the raw HDD.

Difficulties experienced during piloting include:

- Phidget data was sometimes missing or corrupted, therefore the decoding could not be done for a few trips.
- Information file (.inf) for data files were missing for some trips.
- Connecting the piloting vehicle to the DAS using QR codes proved to be difficult.
- Not being able to see snapshot for all trips (one snapshot was available every 3-4 trips).

It was learnt that when scanning OR of the vehicle and save it, one needs to scan the QR of the DAS again in order to be able to connect the vehicle to the specific DAS.

3.3.7 Participants support

During the piloting period, only one call was received from the participant. The call was received on 29.05.2015 with the question that the light of the cluster cameras was off. The participant was asked to visit the Bosch garage on 1.06.2015, where the problem was solved. The participant was happy as the problem was solved during the next working day.

☒ **CHK_06_01.** A hotline log has been created.

☒ **CHK_06_02.** Hotline could be reached whenever it was supposed to be available.

☒ **CHK_06_03.** Pilot participants were called back with acceptable delay when they left a message.

☒ **CHK_06_04.** All issues raised by pilot participants were solved.

☒ **CHK_06_05.** OS is ready to deal with unexpected events related to participants (vehicle dropout or driver exclusion).

3.3.8 Hard drive exchange

Two hard drive exchanges were carried out during piloting. The first was after the initial two weeks of driving; while the second was at the end of the piloting. No problems occurred during the exchanges.

☒ **CHK_07_01.** Hard-drive and hard drive tray were not damaged during hard drive exchange.

☒ **CHK_07_02.** New hard-drive was properly recognized by DAS after hard-drive exchange.

☒ **CHK_07_03.** Hard-drive exchange operations were properly logged in Online Monitoring Tool.

3.3.9 Local data storage

☒ **CHK_06_01.** OS has implemented suitable tools and procedures to protect all collected and stored data from inappropriate use (DrivingData, SubjectiveData, Personal data)

☒ **CHK_06_01.a** OS has set-up a suitable premises (restricted area) to store vehicles and participants related data (HDD, participants contracts, personal data ...), so that each type of data is only accessible to personals who have the corresponding credentials

☒ **CHK_06_01.b** OS has designated authorized personals for accessing each type of data

Data Type	Protection measures (physical storage / IT protection)	Access Authorized to (names)
Vehicle data HDD	HDDs taken from vehicles will be placed in protection cases to prevent any damage while transported. After pre-processing the HDDs will be filed in our lockable archive. Drivers will be placed in protective cases to minimise losing data because of humidity, among other possible factors.	Mohamed Mahmod Chakajkla Jesdabodi
Participant contracts	Participant contracts are locked in a secure storage and only the test site leader has access to it.	Mohamed Mahmod
Participants personal data	Stored both in digital and paper forms. Digital data is protected using the encryption software “TrueCrypt”. Paper versions are locked in a secure storage.	Mohamed Mahmod Felix Worch

3.4 Polish OS

3.4.1 Feedback on recruitment

- Recruitment process reminder

We contacted several companies looking for a fleet to take part in the tests. Initial agreement with one company was set, but without continuation.

Private participants were recruited via internet websites for Renault fans (internet forums), using leaflets placed on the cars and from the Institute employees.

- Difficulties and lessons learnt

Due to the delay in starting the project some companies lost their interest in participating in the project.

Individual participants as well as forum administrators had many concerns about taking part in the project, because of the constant monitoring of the participants' behaviour. No Renault association was willing to cooperate.

Newspaper advertisements were too expensive to be considered as a mean of recruitment.

The pilot participant was an employee from our Institute and willing to be available for all necessary technical amendments to the car installation, which is was very helpful.

- Resulting sample characteristics

			Target	**Realized**		
Vehicles			= 30	1(pilot) + 24		
Drivers			≥ 50	35		
Multi-drivers cars	22-65 y/o		≥ 12	10		
Mileage			≥ 10 000 km	Min	Median	Max
Gender / Age / Vehicle Type Matrix						
Male	22-65 y/o	Overall	≥ 15	19		
		Small cars	≥ 4	6		
		Mid-sized family cars	≥ 4	13		
Female	22-65 y/o	Overall	≥ 15	16		
		Small cars	≥ 4	12		
		Mid-sized family cars	≥ 4	4		

3.4.2 Operation Site responsible and teams designation and training

☒ **CHK_01_01.** All OS Task Responsibles are designed.

☒ **CHK_01_02.** Each OS Task Responsible:

☒ **CHK_01_02.a** has read the full use cases description of OS operations.

☒ **CHK_01_02.b** has read the documentation related to his/her task.

☒ **CHK_01_02.c** has trained his/her own team collaborating to the task he/she's responsible for.

☒ **CHK_01_02.d** is aware of his/her responsibilities.

	Name	Email address	Phone number
OS Legal responsible	Leszek Rafalski	lrafalski@ibdim.edu.pl	+ 48 (0) 22 814 50 25
OS Operations responsible	Jacek Malasek	jmalasek@ibdim.edu.pl	+ 48 (0) 22 814 10 73
OS Participants Handling responsible	Leszek Kornalewski	lkornalewski@ibdim.edu.pl	+ 48 (0) 22 814 10 73
OS Data Quality responsible	Leszek Kornalewski	lkornalewski@ibdim.edu.pl	+ 48 (0) 22 814 10 73
OS Data pick-up and transfer manager	Leszek Kornalewski	lkornalewski@ibdim.edu.pl	+ 48 (0) 22 814 10 73

3.4.3 Legal Authorizations

☒ **CHK_02_01.** OS has all legal authorizations to collect all personal data as defined in UDRIVE's study plan (including: biographic details, travels, driving behaviour...).

☒ **CHK_02_02.** OS is authorized to systematically record geolocalized / timestamped / video data of exterior scenes from instrumented vehicles in its country.

☒ **CHK_02_03.** OS is authorized to systematically record video data of vehicle's interior, including driver and passengers.

☒ **CHK_02_04.** OS has legal authorizations to transfer data which has to be transferred (OS to LDC and LCD to CDC)

☒ **CHK_02_05.** OS has the authorization from the UDRIVE Data protection certification organization.

3.4.4 Participants registration, hazard perception test and questionnaires

☒ **CHK_03_01.** OS has prepared a briefing presentation which presents:

☒ **CHK_03_01.a** The OS

☒ **CHK_03_01.b** The UDRIVE project

☒ **CHK_03_01.c** The overall organization of data collection

☒ **CHK_03_01.d** The vehicle instrumentation and the data it collects

☒ **CHK_03_01.e** The overall content of the questionnaires (topics addressed)

☒ **CHK_03_01.f** The legal and ethical framework

☒ **CHK_03_01.g** OS and Participants engagements, rights and obligations

☒ **CHK_03_01.h** The content of contractual documents

☒ **CHK_03_01.i** The organisation of the hotline

☒ **CHK_03_01.j** The incentives payment principle and organisation

☒ **CHK_03_02.** Remarks from pilot participants are taken into account in the final briefing presentation version. Answers to their most common questions are also integrated in the presentation.

☒ **CHK_03_03.** Participant agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_04.** Vehicle owner agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_05.** Participants' identification badges, bearing hotline contact information are ready.

☒ **CHK_03_06.** OS has suitable facilities for participants' registration and briefing.

☒ **CHK_03_06.a** OS can suitably host participants during initial briefing.

☒ **CHK_03_06.b** OS can suitably present them the briefing presentation.

☒ **CHK_03_07.** Dedicated room, equipment and team training allow suitable identification pictures to be taken.

☒ **CHK_03_08.** Questionnaires have been translated in local language and are implemented either as paper questionnaires which will be typed in electronic documents by OS teams, or directly as an electronic questionnaire (e.g. Limesurvey)

☐ **CHK_03_09.** Questionnaires encoded using the coding scheme document and delivered to the CDC.

☐ **CHK_03_10.** Questionnaires integrated at the CDC are complete and match pilot participants answers (no mix-up during conversion, translation…)

☒ **CHK_03_11.** Hazard perception test implemented following the instructions provided by SP1.

☒ **CHK_03_12.** Hazard perception tests delivered to the CDC have the right format.

Participant was an employee of our Institute and eager to help. All questionnaires to CDC will be sent when collected.

3.4.5 Vehicle Instrumentation

- DAS installation team company:

  ALCAR

  01-641 Warszawa,

  ul. Marii Kazimiery

  Alcar biuro@alcar.com.pl

  tel. 22 833 00 77

- Mobileye installation team:

  Mr. Jarosław Awgul,

  Mr. Marek Sikora,

Mr. Wiesław Padoł,

Mr. Sylwester Lipnicki.

- DAS installation will take place in a licensed Renault workshop:

  DECAR Sp. z o. o.

  03-170 Warszawa

  ul. Modlińska 154B.

  Technical consultant: Mr. Piotr Kybajek

☒ **CHK_04_01.** Garage information notices have been translated to local language and are given to installation team.

☒ **CHK_04_02.** Vehicle questionnaire have been translated to local language and are given to installation team.

☐ **CHK_04_03.** Vehicle questionnaires delivered to the CDC have the right format.

☒ **CHK_04_04.** Installation team is a Mobileye certified installer.

☒ **CHK_04_05.** Installation team has all necessary tools and facilities for installing the DAS and calibrating the Mobileye system.

☒ **CHK_04_06.** Installation team has closely followed the installation manual during piloting.

☒ **CHK_04_07.** Absolutely no damage has occurred to the vehicle during the pilot instrumentation.

☐ **CHK_04_08.** No major difficulty was identified during pilot instrumentation

See comments above.

☒ **CHK_04_09.** No instrumentation operation remained unclear after piloting

☐ **CHK_04_10.** All instrumentation related operations were correctly logged in Online Monitoring Tool.

☒ **CHK_04_11.** Absolutely no traces of instrumentation remain after un-installation of the DAS.

☒ **CHK_04_12.** Installation team has signed a contract recognizing that they are fully responsible for any harm or damage resulting from them not following the provided guidelines and installation manuals.

☒ **CHK_04_13.** Vehicle adaptation team gave final approval on installation team selection.

During the piloting period of the project not all data was collected and procedures regarding DAS installation and HDD preparation were unclear (no CAN data were collected. Videos from 5 of 7 cameras were properly recorded. Two cameras were improperly installed). Problems encountered were solved in the later phase of data collection.

After piloting the pilot participant became a regular project participant.

Regarding the validity of the vehicle questionnaire format, no feedback has been received from the CDC.

3.4.6 Vehicle Data collection and monitoring

☐ **CHK_05_01. <u>Each and every trip</u>** (as declared in the pilot participants' logbook) was correctly logged:

- ☐ **CHK_05_01.a** Record folders created with correct date.
- ☐ **CHK_05_01.b** Can be decoded and visualized.
- ☐ **CHK_05_01.c** All signals and video streams are present.
- ☐ **CHK_05_01.d** No incoherence between signals is apparent (e.g. vehicle speed <> GPS Speed, Steering wheel <> lateral acceleration…)
- ☐ **CHK_05_01.e** No synchronization problem can be observed (e.g. feet video channel <> brake pedal signal…)
- ☐ **CHK_05_01.f** Data acquisition didn't end while the vehicle was moving.
- ☐ **CHK_05_01.g** GPS starts shortly after declared start of trip location, GPS ends precisely at declared end of trip location.

☐ **CHK_05_02.** The data logger successfully connected to the OMT during each trip.

☐ **CHK_05_03.** A status report was generated and synchronized to the OMT for each trip.

☐ **CHK_05_04.** No status report shows any defect in the DAS operation.

☒ **CHK_05_05.** Pilot participants didn't observe any strange behaviour of the vehicle or complained about the instrumentation.

3.4.7 Participants support

☒ **CHK_06_01.** A hotline log has been created.

☒ **CHK_06_02.** Hotline could be reached whenever it was supposed to be available.

☐ **CHK_06_03.** Pilot participants were called back with acceptable delay when they left a message.

☒ **CHK_06_04.** All issues raised by pilot participants were solved.

☒ **CHK_06_05.** OS is ready to deal with unexpected events related to participants (vehicle dropout or driver exclusion).

The pilot participant actually never used the hotline.

3.4.8 Hard drive exchange

☒ **CHK_07_01.** Hard-drive and hard drive tray were not damaged during hard drive exchange.

☐ **CHK_07_02.** New hard-drive was properly recognized by DAS after hard-drive exchange.

☐ **CHK_07_03.** Hard-drive exchange operations were properly logged in Online Monitoring Tool.

A new hard drive was not recognized by the DAS. We couldn't connect to the DAS from our computer. The IT technician informed us that the DAS's IP had probably changed. DAS recalibration was necessary.

In the beginning, some problems occurred during QR codes scanning. It was necessary to attach and detach the hard drive from the DAS several times, before it could read the next hard drive. However, these problems did not occur afterwards.

3.4.9 Local data storage

☒ **CHK_06_01.** OS has implemented suitable tools and procedures to protect all collected and stored data from inappropriate use (DrivingData, SubjectiveData, Personal data)

☒ **CHK_06_01.a** OS has set-up a suitable premises (restricted area) to store vehicles and participants related data (HDD, participants contracts, personal data ...), so that each type of data is only accessible to personals who have the corresponding credentials

☒ **CHK_06_01.b** OS has designated authorized personals for accessing each type of data

Data Type	Protection measures (physical storage / IT protection)	Access Authorized to (names)
Vehicle data HDD	Safe in a secured room with restricted access and all necessary fire protection	Leszek Kornalewski
Participant contracts	Safe in a secured room with restricted access and all necessary fire protection	Leszek Kornalewski
Participants personal data	Safe in a secured room with restricted access and all necessary fire protection	Leszek Kornalewski

3.5 Spanish OS

3.5.1 Feedback on recruitment

- Recruitment process reminder

The recruitment process started on February 2015. An advertisement was published in Cidaut's internal network and also in a local newspaper. Within two weeks, 51 potential participants contacted us and they were registered in a file. The participants' selection was done following the criteria established in the WP1.2. We had to repeat the procedure due to the shift of the scooters from Austria and also because some of the initial participants dropped out of the study

- Difficulties and lessons learnt

It has been difficult to find women that want to participate in the study.

In the Spanish OS, the scooters were rented and lent to the participants, which made the recruitment easier.

Six months passed since the recruitment was done until the study started. Such a long waiting time caused some of the drop outs. Subsequently, the replacement for those participants together with the additional 15 riders made us diverge from the initial gender/age objective.

- Resulting sample characteristics

		Target	**Realized**		
Vehicles		= 40	40		
Drivers		≥ 40	40		
Multi-drivers scooters	22-65 y/o	≥ 0	Impossible due to an insurance clause, only one rider		
Mileage		≥ 10 000 km	Min	Median	Max
			1,000	2,000	15,000
Gender / Age Matrix					
Male	18-25 y/o	≥ 7	0		
	25-45 y/o	≥ 14	26		
	46-70 y/o	≥ 7	2		
Female	18-25 y/o	≥ 6	1		
	25-45 y/o	≥ 6	9		
	46-70 y/o	≥ 0	2		

3.5.2 Operation Site responsible and teams designation and training

☒ **CHK_01_01.** All OS Task Responsibles are designed.

☒ **CHK_01_02.** Each OS Task Responsible:

☒ **CHK_01_02.a** has read the full use cases description of OS operations.

☒ **CHK_01_02.b** has read the documentation related to his/her task.

☒ **CHK_01_02.c** has trained his/her own team collaborating to the task he/she's responsible for.

☒ **CHK_01_02.d** is aware of his/her responsibilities.

	Name	Email address	Phone number
OS Legal responsible	Juan Carlos Merino	juamer@cidaut.es	+34(0)983550480
OS Operations responsible	Oscar Martin	oscmar@cidaut.es	+34(0)983550480 ext. 5186
OS Participants Handling responsible	Oscar Martin	oscmar@cidaut.es	+34(0)983550480 ext. 5186
OS Data Quality responsible	Álvaro García	alvgar@cidaut.es	+34(0)983550480 ext. 1610
OS Data pick-up and transfer manager	Carlos Gutierrez	cargut@cidaut.es	+34(0)983550480 ext. 5109

3.5.3 Legal Authorizations

☒ **CHK_02_01.** OS has all legal authorizations to collect all personal data as defined in UDRIVE's study plan (including: biographic details, travels, driving behaviour...).

☒ **CHK_02_02.** OS is authorized to systematically record geolocalized / timestamped / video data of exterior scenes from instrumented vehicles in its country.

☒ **CHK_02_03.** OS is authorized to systematically record video data of vehicle's interior, including driver and passengers.

☒ **CHK_02_04.** OS has legal authorizations to transfer data which has to be transferred (OS to LDC and LCD to CDC).

☒ **CHK_02_05.** OS has the authorization from the UDRIVE Data protection certification organization.

3.5.4 Participants registration, hazard perception test and questionnaires

☒ **CHK_03_01.** OS has prepared a briefing presentation which presents:

- ☒ **CHK_03_01.a** The OS
- ☒ **CHK_03_01.b** The UDRIVE project
- ☒ **CHK_03_01.c** The overall organization of data collection
- ☒ **CHK_03_01.d** The vehicle instrumentation and the data it collects
- ☒ **CHK_03_01.e** The overall content of the questionnaires (topics addressed)
- ☒ **CHK_03_01.f** The legal and ethical framework
- ☒ **CHK_03_01.g** OS and Participants engagements, rights and obligations
- ☒ **CHK_03_01.h** The content of contractual documents
- ☒ **CHK_03_01.i** The organisation of the hotline

☒ **CHK_03_01.j** The incentives payment principle and organisation

☒ **CHK_03_02.** Remarks from pilot participants are taken into account in the final briefing presentation version. Answers to their most common questions are also integrated in the presentation.

☒ **CHK_03_03.** Participant agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_04.** Vehicle owner agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_05.** Participants' identification badges, bearing hotline contact information are ready.

☒ **CHK_03_06.** OS has suitable facilities for participants' registration and briefing.

☒ **CHK_03_06.a** OS can suitably host participants during initial briefing.

☒ **CHK_03_06.b** OS can suitably present them the briefing presentation.

☒ **CHK_03_07.** Dedicated room, equipment and team training allow suitable identification pictures to be taken.

☒ **CHK_03_08.** Questionnaires have been translated in local language and are implemented either as paper questionnaires which will be typed in electronic documents by OS teams, or directly as an electronic questionnaire (e.g. Limesurvey)

☒ **CHK_03_09.** Questionnaires encoded using the coding scheme document and delivered to the CDC.

☒ **CHK_03_10.** Questionnaires integrated at the CDC are complete and match pilot participants answers (no mix-up during conversion, translation…)

☒ **CHK_03_11.** Hazard perception test implemented following the instructions provided by SP1.

☒ **CHK_03_12.** Hazard perception tests delivered to the CDC have the right format.

All of the recruited participants accepted to join the study, however 5 of them did not accept that their images will be used outside the UDRIVE project and 12 participants did not accept to have interviews or to participate in workshops after the data collection.

The appointments with the participants to do the briefing, questionnaires and give them the scooter took place during two months, avoiding having more than 2 each day.

Questionnaires were collected in a paper version to be registered in an electronic version.

- A great number of particpants found the questionnaires very long and considered some questions inappropiate.

- Many participants found the AISS questionnaire inappropiate, disconcerting or strange and that it had nothing to do with the study.

- Some participants pointed out that certain questions were redundant.

- The hazard perception test is being processed.

3.5.5 Vehicle Instrumentation

The installations were undertaken by CIDAUT, namely by Alberto Pisonero, Carlos Gutierrez (email: cargut@cidaut.es, phone: +34(0)983550480 ext. 5109), and Raul Catalina. All installs were carried out in the Cidaut headquarters at Boecillo (Valladolid), Spain.

☒ **CHK_04_01.** Garage information notices have been translated to local language and are given to installation team.

☒ **CHK_04_02.** Vehicle questionnaire have been translated to local language and are given to installation team.

☐ **CHK_04_03.** Vehicle questionnaires delivered to the CDC have the right format.

☐ **CHK_04_04.** Installation team is a Mobileye certified installer.

☒ **CHK_04_05.** Installation team has all necessary tools and facilities for installing the DAS and calibrating the Mobileye system.

☒ **CHK_04_06.** Installation team has closely followed the installation manual during piloting.

☒ **CHK_04_07.** Absolutely no damage has occurred to the vehicle during the pilot instrumentation.

☒ **CHK_04_08.** No major difficulty was identified during pilot instrumentation

☒ **CHK_04_09.** No instrumentation operation remained unclear after piloting

☒ **CHK_04_10.** All instrumentation related operations were correctly logged in Online Monitoring Tool.

☒ **CHK_04_11.** Absolutely no traces of instrumentation remain after un-installation of the DAS.

☒ **CHK_04_12.** Installation team has signed a contract recognizing that they are fully responsible for any harm or damage resulting from them not following the provided guidelines and installation manuals.

☒ **CHK_04_13.** Vehicle adaptation team gave final approval on installation team selection.

The model selected to be equipped was the Piaggio Liberty Delivery. Vehicle questionnaires and mobileye certification do not apply for this OS. The main difficulties during the pilot include:

- The data logger rebooted sometimes with no apparent reason and the status report was not working properly.
- The speed sensor was not working properly in some of the installations and the installation had to be done again.
- The software update arrived with a delay that did not allow us to perform many tests of the entire system. Also, software re-install lacked robustness and there were ghost partitions that needed to be removed from the compact flash.

3.5.6 Vehicle Data collection and monitoring

☒ **CHK_05_01. Each and every trip** (as declared in the pilot participants' logbook) was correctly logged:

- ☒ **CHK_05_01.a** Record folders created with correct date.
- ☐ **CHK_05_01.b** Can be decoded and visualized.
- ☒ **CHK_05_01.c** All signals and video streams are present.
- ☐ **CHK_05_01.d** No incoherence between signals is apparent (e.g. vehicle speed <> GPS Speed, Steering wheel <> lateral acceleration…)
- ☐ **CHK_05_01.e** No synchronization problem can be observed (e.g. feet video channel <> brake pedal signal…)
- ☒ **CHK_05_01.f** Data acquisition didn't end while the vehicle was moving.
- ☒ **CHK_05_01.g** GPS starts shortly after declared start of trip location, GPS ends precisely at declared end of trip location.

☒ **CHK_05_02.** The data logger successfully connected to the OMT during each trip.

☒ **CHK_05_03.** A status report was generated and synchronized to the OMT for each trip.

☒ **CHK_05_04.** No status report shows any defect in the DAS operation.

☒ **CHK_05_05.** Pilot participants didn't observe any strange behaviour of the vehicle or complained about the instrumentation.

In general, the piloting phase had many problems. The integration of the equipment in the scooter was very difficult due to the reduced physical space, the weight limitations, the hardware and the software. Data from the pilot were sent to the CDC. As OS, we do not have access to decoded data, so we could not check the synchronisation or the incoherence of the signals, hence the unchecked boxes below.

3.5.7 Participants support

The interaction was very effective and dynamic.

☒ **CHK_06_01.** A hotline log has been created.

☒ **CHK_06_02.** Hotline could be reached whenever it was supposed to be available.

☒ **CHK_06_03.** Pilot participants were called back with acceptable delay when they left a message.

☒ **CHK_06_04.** All issues raised by pilot participants were solved.

☒ **CHK_06_05.** OS is ready to deal with unexpected events related to participants (vehicle dropout or driver exclusion).

3.5.8 Hard drive exchange

No problems found during the hard drive exchanges.

☒ **CHK_07_01.** Hard-drive and hard drive tray were not damaged during hard drive exchange.

☒ **CHK_07_02.** New hard-drive was properly recognized by DAS after hard-drive exchange.

☒ **CHK_07_03.** Hard-drive exchange operations were properly logged in Online Monitoring Tool.

3.5.9 Local data storage

Hard drives, as well as participants' contracts and personal data are locked in a safe in a room with restricted access. Furthermore, participants' personal data are only accessible to three people.

☒ **CHK_06_01.** OS has implemented suitable tools and procedures to protect all collected and stored data from inappropriate use (DrivingData, SubjectiveData, Personal data)

☒ **CHK_06_01.a** OS has set-up a suitable premises (restricted area) to store vehicles and participants related data (HDD, participants contracts, personal data ...), so that each type of data is only accessible to personals who have the corresponding credentials

☒ **CHK_06_01.b** OS has designated authorized personals for accessing each type of data

Data Type	Protection measures (physical storage / IT protection)	Access Authorized to (names)
Vehicle data HDD	Safe	
Participant contracts	Safe	Oscar Martin and Carlos Gutierrez
Participants personal data	Safe	Oscar Martin and Carlos Gutierrez

3.6 Dutch OS – cars

Cars at the Dutch OS did not run a pilot, since we wanted to start as soon as possible and since we had experience with the truck pilot. There are no data yet from the cars. Here the experiences are described from the start.

3.6.1 Feedback on recruitment

- Recruitment process reminder

Recruitment was fairly easy, since we could offer lease-cars. Within a short amount of time we had more than enough participants and we could choose in order to get a representative distribution (males, females, age etc.).

- Difficulties and lessons learnt

There was a delay in instrumentation since we were dependent on the French OS for this, since we are not licensed ourselves for the person cars. But this was solved by a good cooperation between CEASAR and us.

- Resulting sample characteristics

			Target	**Realized**		
Vehicles			= 10	10		
Drivers			= 30	30		
Multi-drivers cars	22-65 y/o		≥ 12	2		
Mileage			≥ 10 000 km	Min	Median	Max
				15,000	25,000	40,000
Gender / Age / Vehicle Type Matrix						
Male	22-65 y/o					
		Renault Clio	15	16		
Female	22-65 y/o					
		Renault Clio	15	16		

3.6.2 Operation Site responsible and teams designation and training

☒ **CHK_01_01.** All OS Task Responsibles are designed.

☒ **CHK_01_02.** Each OS Task Responsible:

- ☒ **CHK_01_02.a** has read the full use cases description of OS operations.
- ☒ **CHK_01_02.b** has read the documentation related to his/her task.

☒ **CHK_01_02.c** has trained his/her own team collaborating to the task he/she's responsible for.

☒ **CHK_01_02.d** is aware of his/her responsibilities.

	Name	Email address	Phone number
OS Legal responsible	Laurens Abbink Spaink	laurens.abbinkspaink@tno.nl	+31 (0) 88 866 32 66
OS Operations responsible	Maartje de Goede	maartje.degoede@tno.nl	+31 (0) 88 866 23 02
OS Participants Handling responsible	Wouda Visser-Ooms	wouda.visser@tno.nl	+31 (0) 88 86 62 02 8
OS Data Quality responsible	Wouda Visser-Ooms	wouda.visser@tno.nl	+31 (0) 88 86 62 02 8
OS Data pick-up and transfer manager	Maartje de Goede	maartje.degoede@tno.nl	+31 (0) 88 866 23 02

3.6.3 Legal Authorizations

☒ **CHK_02_01.** OS has all legal authorizations to collect all personal data as defined in UDRIVE's study plan (including: biographic details, travels, driving behaviour...).

☒ **CHK_02_02.** OS is authorized to systematically record geolocalized / timestamped / video data of exterior scenes from instrumented vehicles in its country.

☒ **CHK_02_03.** OS is authorized to systematically record video data of vehicle's interior, including driver and passengers.

☒ **CHK_02_04.** OS has legal authorizations to transfer data which has to be transferred (OS to LDC and LCD to CDC)

☒ **CHK_02_05.** OS has the authorization from the UDRIVE Data protection certification organization

3.6.4 Participants registration, hazard perception test and questionnaires

☒ **CHK_03_01.** OS has prepared a briefing presentation which presents:

- ☒ **CHK_03_01.a** The OS
- ☒ **CHK_03_01.b** The UDRIVE project
- ☒ **CHK_03_01.c** The overall organization of data collection
- ☒ **CHK_03_01.d** The vehicle instrumentation and the data it collects
- ☒ **CHK_03_01.e** The overall content of the questionnaires (topics addressed)
- ☒ **CHK_03_01.f** The legal and ethical framework
- ☒ **CHK_03_01.g** OS and Participants engagements, rights and obligations
- ☒ **CHK_03_01.h** The content of contractual documents

☒ **CHK_03_01.i** The organisation of the hotline

☒ **CHK_03_01.j** The incentives payment principle and organisation

☒ **CHK_03_02.** Remarks from pilot participants are taken into account in the final briefing presentation version. Answers to their most common questions are also integrated in the presentation.

☒ **CHK_03_03.** Participant agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_04.** Vehicle owner agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_05.** Participants' identification badges, bearing hotline contact information are ready.

☒ **CHK_03_06.** OS has suitable facilities for participants' registration and briefing.

☒ **CHK_03_06.a** OS can suitably host participants during initial briefing.

☒ **CHK_03_06.b** OS can suitably present them the briefing presentation.

☒ **CHK_03_07.** Dedicated room, equipment and team training allow suitable identification pictures to be taken.

☒ **CHK_03_08.** Questionnaires have been translated in local language and are implemented either as paper questionnaires which will be typed in electronic documents by OS teams, or directly as an electronic questionnaire (e.g. Limesurvey)

☐ **CHK_03_09.** Questionnaires encoded using the coding scheme document and delivered to the CDC.

☐ **CHK_03_10.** Questionnaires integrated at the CDC are complete and match pilot participants answers (no mix-up during conversion, translation…)

☒ **CHK_03_11.** Hazard perception test implemented following the instructions provided by SP1.

☐ **CHK_03_12.** Hazard perception tests delivered to the CDC have the right format.

Questionnaires and hazard perception tests have not yet been delivered to the CDC. This is because they were not yet digitalized. This will be done before September 1st 2016.

The example of the hazard perception test was not clear. Everybody stated that they would not have reduced speed in reality since they did not observe any hazard.

Some participants mentioned that it was not always clear how to interpret the questions exactly in the questionnaires.

We mentioned to the participants that the registration procedure would last 1.5 hour (instruction, questionnaires etc.). In reality it was around 1 hour in total, so nobody complained on the duration. We sent part of the questionnaires in advance to the participants by e-mail. This saved time.

3.6.5 Vehicle Instrumentation

Installation was done by a certified installer from CEASAR and a mobileye certified installer from the Netherlands. Installation went well.

☒ **CHK_04_01.** Garage information notices have been translated to local language and are given to installation team.

☒ **CHK_04_02.** Vehicle questionnaire have been translated to local language and are given to installation team.

☒ **CHK_04_03.** Vehicle questionnaires delivered to the CDC have the right format.

☒ **CHK_04_04.** Installation team is a Mobileye certified installer.

☒ **CHK_04_05.** Installation team has all necessary tools and facilities for installing the DAS and calibrating the Mobileye system.

☒ **CHK_04_06.** Installation team has closely followed the installation manual during piloting.

☒ **CHK_04_07.** Absolutely no damage has occurred to the vehicle during the pilot instrumentation.

☒ **CHK_04_08.** No major difficulty was identified during pilot instrumentation

☒ **CHK_04_09.** No instrumentation operation remained unclear after piloting

☒ **CHK_04_10.** All instrumentation related operations were correctly logged in Online Monitoring Tool.

☒ **CHK_04_11.** Absolutely no traces of instrumentation remain after un-installation of the DAS.

☒ **CHK_04_12.** Installation team has signed a contract recognizing that they are fully responsible for any harm or damage resulting from them not following the provided guidelines and installation manuals.

☒ **CHK_04_13.** Vehicle adaptation team gave final approval on installation team selection.

3.6.6 Vehicle Data collection and monitoring

Cars at the Dutch OS did not run a pilot, since we wanted to start as soon as possible and since we had experience with the truck pilot. There are no data yet from the cars. At present the data-registration is carefully monitored in the OMT.

☐ **CHK_05_01.** **Each and every trip** (as declared in the pilot participants' logbook) was correctly logged:

- ☐ **CHK_05_01.a** Record folders created with correct date.
- ☐ **CHK_05_01.b** Can be decoded and visualized.
- ☐ **CHK_05_01.c** All signals and video streams are present.
- ☐ **CHK_05_01.d** No incoherence between signals is apparent (e.g. vehicle speed <> GPS Speed, Steering wheel <> lateral acceleration…)
- ☐ **CHK_05_01.e** No synchronization problem can be observed (e.g. feet video channel <> brake pedal signal…)
- ☐ **CHK_05_01.f** Data acquisition didn't end while the vehicle was moving.
- ☐ **CHK_05_01.g** GPS starts shortly after declared start of trip location, GPS ends precisely at declared end of trip location.

☐ **CHK_05_02.** The data logger successfully connected to the OMT during each trip.

☐ **CHK_05_03.** A status report was generated and synchronized to the OMT for each trip.

☐ **CHK_05_04.** No status report shows any defect in the DAS operation.

☐ **CHK_05_05.** Pilot participants didn't observe any strange behaviour of the vehicle or complained about the instrumentation.

3.6.7 Participants support

☒ **CHK_06_01.** A hotline log has been created.

☒ **CHK_06_02.** Hotline could be reached whenever it was supposed to be available.

☒ **CHK_06_03.** Pilot participants were called back with acceptable delay when they left a message.

☒ **CHK_06_04.** All issues raised by pilot participants were solved.

☒ **CHK_06_05.** OS is ready to deal with unexpected events related to participants (vehicle dropout or driver exclusion).

Two participants e-mailed us with a question. One question was on the indication light on the camera; she wondered whether the cameras worked or not, since the light on the camera indicated that it was not switched on. However, this takes a minute or 2 after the car is started. Another participant heard a weird noise, but this was probably caused by the DAS when starting up.

3.6.8 Hard drive exchange

No hard drives have been exchanged yet.

☒ **CHK_07_01.** Hard-drive and hard drive tray were not damaged during hard drive exchange.

☒ **CHK_07_02.** New hard-drive was properly recognized by DAS after hard-drive exchange.

☒ **CHK_07_03.** Hard-drive exchange operations were properly logged in Online Monitoring Tool.

3.6.9 Local data storage

Local data are stored in protected environment (The TNO institute can only be entered with a valid TNO pass) and in restricted area within the TNO institute. Digital data are stored on a protected server with restricted access to the people working with the data.

☒ **CHK_06_01.** OS has implemented suitable tools and procedures to protect all collected and stored data from inappropriate use (DrivingData, SubjectiveData, Personal data)

> ☒ **CHK_06_01.a** OS has set-up a suitable premises (restricted area) to store vehicles and participants related data (HDD, participants contracts, personal data ...), so that each type of data is only accessible to personals who have the corresponding credentials
>
> ☒ **CHK_06_01.b** OS has designated authorized personals for accessing each type of data

Data Type	Protection measures (physical storage / IT protection)	Access Authorized to (names)
Vehicle data HDD		
Participant contracts	Restricted area (is closed for unauthorized personnel)	Maartje de Goede, Marika Hoedemaeker
Participants personal data	Restricted area (is closed for unauthorized personnel)	Maartje de Goede, Marika Hoedemaeker

3.7 Dutch OS - trucks

3.7.1 Feedback on recruitment

- Recruitment process reminder

Recruitment of trucks turned out to be a very difficult process. The main reasons for this are:

Truck companies have a workers union that has to approve of changes to the drivers work environment. These unions think only in the interest of the driver and they are very suspicious concerning privacy issues of their drivers. So, in some of the contacted fleets, the drivers' union said no.

The EURO 5 types that we need will be changed to EURO 6 within 1 year (so no possibility to join for 18-23 months). This is a result of the long delay between the original planning of starting the pilots and the actual start (no DAS available).

Fleet owner does not see any commercial interest for their company. So not willing to put effort in this (and it is quite an effort).

There are not that many Volvo trucks on the road in the Netherlands.

- Difficulties and lessons learnt

Recruitment of trucks is a very time consuming process. This because there are different entities in the process that you need to convince to join the project. First, there is the main contact person of the fleet. Then there is the company management and only in the end there is the truck driver himself. Compared to just recruiting a person and his car, this takes much more time and much more effort.

- Resulting sample characteristics

		Target	**Realized**		
Trucks		= 50	34		
Drivers		≥ 50	46		
Multi-drivers Trucks	22-65 y/o	≥ 12	16		
Mileage		≥ 10 000 km	Min	Median	Max

NB: the mileage per truck participant is unknown since we never asked their mileage (truck drivers drive 40 hours per week for work, they have no idea about their personal mileage).

3.7.2 Operation Site responsible and teams designation and training

☒ **CHK_01_01.** All OS Task Responsibles are designed.

☒ **CHK_01_02.** Each OS Task Responsible:

☒ **CHK_01_02.a** has read the full use cases description of OS operations.

☒ **CHK_01_02.b** has read the documentation related to his/her task.

☒ **CHK_01_02.c** has trained his/her own team collaborating to the task he/she's responsible for.

☒ **CHK_01_02.d** is aware of his/her responsibilities.

	Name	Email address	Phone number
OS Legal responsible	Laurens Abbink Spaink	laurens.abbinkspaink@tno.nl	+31 (0) 88 866 32 66
OS Operations responsible	Maartje de Goede	maartje.degoede@tno.nl	+31 (0) 88 866 23 02
OS Participants Handling responsible	Wouda Visser-Ooms	wouda.visser@tno.nl	+31 (0) 88 866 20 28
OS Data Quality responsible	Wouda Visser-Ooms	wouda.visser@tno.nl	+31 (0) 88 866 20 28
OS Data pick-up and transfer manager	Maartje de Goede	maartje.degoede@tno.nl	+31 (0) 88 866 23 02

3.7.3 Legal Authorizations

☒ **CHK_02_01.** OS has all legal authorizations to collect all personal data as defined in UDRIVE's study plan (including: biographic details, travels, driving behaviour...).

☒ **CHK_02_02.** OS is authorized to systematically record geolocalized / timestamped / video data of exterior scenes from instrumented vehicles in its country.

☒ **CHK_02_03.** OS is authorized to systematically record video data of vehicle's interior, including driver and passengers.

☒ **CHK_02_04.** OS has legal authorizations to transfer data which has to be transferred (OS to LDC and LCD to CDC)

☒ **CHK_02_05.** OS has the authorization from the UDRIVE Data protection certification organization

3.7.4 Participants registration, hazard perception test and questionnaires

Hazard perception tests have been performed by the truck drivers, but the data has not yet been documented and transferred. This is because they were not yet digitalized. This will be done before september 1st 2016.

☒ **CHK_03_01.** OS has prepared a briefing presentation which presents:

☒ **CHK_03_01.a** The OS

☒ **CHK_03_01.b** The UDRIVE project

☒ **CHK_03_01.c** The overall organization of data collection

☒ **CHK_03_01.d** The vehicle instrumentation and the data it collects

☒ **CHK_03_01.e** The overall content of the questionnaires (topics addressed)

☒ **CHK_03_01.f** The legal and ethical framework

☒ **CHK_03_01.g** OS and Participants engagements, rights and obligations

☒ **CHK_03_01.h** The content of contractual documents

☒ **CHK_03_01.i** The organisation of the hotline

☒ **CHK_03_01.j** The incentives payment principle and organisation

☒ **CHK_03_02.** Remarks from pilot participants are taken into account in the final briefing presentation version. Answers to their most common questions are also integrated in the presentation.

☒ **CHK_03_03.** Participant agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_04.** Vehicle owner agreement in local language is ready. Corrections following pilot participants remarks have been done.

☒ **CHK_03_05.** Participants' identification badges, bearing hotline contact information are ready.

☒ **CHK_03_06.** OS has suitable facilities for participants' registration and briefing.

☒ **CHK_03_06.a** OS can suitably host participants during initial briefing.

☒ **CHK_03_06.b** OS can suitably present them the briefing presentation.

☒ **CHK_03_07.** Dedicated room, equipment and team training allow suitable identification pictures to be taken.

☒ **CHK_03_08.** Questionnaires have been translated in local language and are implemented either as paper questionnaires which will be typed in electronic documents by OS teams, or directly as an electronic questionnaire (e.g. Limesurvey).

☐ **CHK_03_09.** Questionnaires encoded using the coding scheme document and delivered to the CDC.

☐ **CHK_03_10.** Questionnaires integrated at the CDC are complete and match pilot participants answers (no mix-up during conversion, translation…).

☒ **CHK_03_11.** Hazard perception test implemented following the instructions provided by SP1.

☐ **CHK_03_12.** Hazard perception tests delivered to the CDC have the right format.

Questionnaires and hazard perception tests have not yet been delivered to the CDC. This is because they were not yet digitalized. This will be done before September 1st, 2016.

3.7.5 Vehicle Instrumentation

Installation was done by a certified company (not by TNO itself). A person from TNO has guided the installers the first days. From then on, installation went well.

☒ **CHK_04_01.** Garage information notices have been translated to local language and are given to installation team.

☒ **CHK_04_02.** Vehicle questionnaire have been translated to local language and are given to installation team.

☐ **CHK_04_03.** Vehicle questionnaires delivered to the CDC have the right format.

☒ **CHK_04_04.** Installation team is a Mobileye certified installer.

☒ **CHK_04_05.** Installation team has all necessary tools and facilities for installing the DAS and calibrating the Mobileye system.

☒ **CHK_04_06.** Installation team has closely followed the installation manual during piloting.

☒ **CHK_04_07.** Absolutely no damage has occurred to the vehicle during the pilot instrumentation.

☒ **CHK_04_08.** No major difficulty was identified during pilot instrumentation

☒ **CHK_04_09.** No instrumentation operation remained unclear after piloting

☒ **CHK_04_10.** All instrumentation related operations were correctly logged in Online Monitoring Tool.

☒ **CHK_04_11.** Absolutely no traces of instrumentation remain after un-installation of the DAS.

☒ **CHK_04_12.** Installation team has signed a contract recognizing that they are fully responsible for any harm or damage resulting from them not following the provided guidelines and installation manuals.

☒ **CHK_04_13.** Vehicle adaptation team gave final approval on installation team selection.

Vehicle questionnaires have not yet delivered to the CDC. This is because they were not yet digitalized. This will be done before September 1st 2016.

3.7.6 Vehicle Data collection and monitoring

For the truck piloting, 2 trucks were equipped with the first version of the DAS.

☐ **CHK_05_01.** **Each and every trip** (as declared in the pilot participants' logbook) was correctly logged:

No logbook was filled in by the truck-drivers for the piloting.

- ☐ **CHK_05_01.a** Record folders created with correct date.
- ☐ **CHK_05_01.b** Can be decoded and visualized.
- ☐ **CHK_05_01.c** All signals and video streams are present.
- ☐ **CHK_05_01.d** No incoherence between signals is apparent (e.g. vehicle speed <> GPS Speed, Steering wheel <> lateral acceleration…)
- ☐ **CHK_05_01.e** No synchronization problem can be observed (e.g. feet video channel <> brake pedal signal…)
- ☐ **CHK_05_01.f** Data acquisition didn't end while the vehicle was moving.
- ☐ **CHK_05_01.g** GPS starts shortly after declared start of trip location, GPS ends precisely at declared end of trip location.

☒ **CHK_05_02.** The data logger successfully connected to the OMT during each trip.

☒ **CHK_05_03.** A status report was generated and synchronized to the OMT for each trip.

☐ **CHK_05_04.** No status report shows any defect in the DAS operation.

☒ **CHK_05_05.** Pilot participants didn't observe any strange behaviour of the vehicle or complained about the instrumentation.

There were no difficulties other than technical problems due to software issues. These had to be solved by SP2 and there was no time left for piloting when the final right software version became available.

Finally, a lot of OMT status reports showed a lot of different defects. Data problems have been caused by:

- Camera sabotage by truck drivers (mostly in cases where trucks were shared, supposedly by non-participants).

- Cameras out of position due to heavy use of the truck.

- DAS system was not installed properly.

- Hard drive was not exchanged properly.

- Technical default in DAS system, GPS etc.

All of these issues have been and are being solved in cooperation with the fleet owners and the company who executes the installations and hard drive exchanges. Also, conversations were held with fleet owners of the companies where there were a lot of issues with cameras. The problem is however that there is most of the time quite some time between the detection of an issue and the moment a truck can be scheduled out in order to solve the problem. If technical issues with cameras remain, we will try to get part of the driving schedules to define who was driving at which moment.

3.7.7 Participants support

In case of the truck drivers, it is not the truck driver himself that calls the hotline but the fleet manager. Truck drivers do not have any issues that they want to report directly to the hotline. If there is trouble they discuss it with the fleet manager.

☒ **CHK_06_01.** A hotline log has been created.

☒ **CHK_06_02.** Hotline could be reached whenever it was supposed to be available.

☒ **CHK_06_03.** Pilot participants were called back with acceptable delay when they left a message.

☒ **CHK_06_04.** All issues raised by pilot participants were solved.

☒ **CHK_06_05.** OS is ready to deal with unexpected events related to participants (vehicle dropout or driver exclusion).

3.7.8 Hard drive exchange

Hard drive exchange is executed by the fleet-owner. The company (BCI) who is involved in the procedural part of the experiment tells the fleet-owner when to plan a hard disks exchange for each truck.

☒ **CHK_07_01.** Hard-drive and hard drive tray were not damaged during hard drive exchange.

☒ **CHK_07_02.** New hard-drive was properly recognized by DAS after hard-drive exchange.

☒ **CHK_07_03.** Hard-drive exchange operations were properly logged in Online Monitoring Tool.

3.7.9 Local data storage

Fleet-owners hand over the hard disks to BCI who brings them to TNO. Before we send them to the LDC (Sweden), hard disks are kept in a restricted area at TNO. Same has been done for personal data, questionnaires. These are personally handed over (digitally as well as the original questionnaires) to TNO, where they are being kept in a restricted area (closed area as well as protected server with limited access).

☒ **CHK_06_01.** OS has implemented suitable tools and procedures to protect all collected and stored data from inappropriate use (DrivingData, SubjectiveData, Personal data)

> ☒ **CHK_06_01.a** OS has set-up a suitable premises (restricted area) to store vehicles and participants related data (HDD, participants contracts, personal data ...), so that each type of data is only accessible to personals who have the corresponding credentials
>
> ☒ **CHK_06_01.b** OS has designated authorized personals for accessing each type of data.

Data Type	Protection measures (physical storage / IT protection)	Access Authorized to (names)
Vehicle data HDD	Restricted area (closed for unauthorised personnel)	Erik Lubberding, Maartje de Goede, Marika Hoedemaeker ubberding (BCI)
Participant contracts	Restricted area (closed for unauthorised personnel)	Maartje de Goede, Marika Hoedemaeker
Participants personal data	Restricted area (closed for unauthorised personnel)	Maartje de Goede, Marika Hoedemaeker