SHared automation Operating models for Worldwide adoption

SHOW

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D3.2: SHOW Ethics Manual and Data Protection Policy

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Executive Summary

SHOW is a user-oriented project where the participation of humans is essential for a successful outcome. A sound and correct ethical treatment of participants is therefore of great importance for SHOW.

The current document constitutes SHOW first version of Ethics Manual, namely D3.2: "SHOW Ethics Manual and Data Protection policy". it constitutes the Ethics Code of Conduct of Research and it aims to be a reference and living document throughout the whole duration of the project with respect to ethical issues and protection of any type of data collected during the lifetime of the project. SHOW will include all potential types of users coming from diverse backgrounds and travel patterns and preferences with the ambition to investigate the sustainability and acceptance of automated driving and traveller experience across different modes and stakeholders in an autonomous urban ecosystem.

While the trends and developments of the last decades tend to be inclusive and such implementations have given rise to many positive developments, concerns about the use of tools, services, and in general technologies, in transport can be summarised as following (adapted from opinion 13 from the European Group on Ethics, EGE):

- The **pervasiveness of a technology** which many people do not understand and have difficulty to incorporate in everyday daily living activities such as transport/commuting.
- The **lack of transparency** of the work of other parties necessarily involved such as IT systems' and control centres' operators, service providers and other involved providers (e.g. vendors) and their effects on the automation/'driver'-'user' relationship (i.e. both commercial and socio-economic related).
- The difficulty of respecting **privacy** and **confidentiality** when third parties may have a strong interest in getting access to electronically recorded and stored personal mobility and transport mode use data.
- The difficulty in **ensuring the security of shared personal, localisation, service-use data**. Therefore, the SHOW Consortium commits to the following:

    - Personal identification data necessarily touch upon the identity and private life of the individual and are thus extremely sensitive.
    - Interoperable services, tools, and architectures create the potential for the free circulation of personal travelling data, across local, national and professional borders, giving such data an enhanced European dimension.

The principles of the European Convention of Human Rights, the rules of the Convention of the Council of Europe for the protection of individuals in relation to automatic processing of personal data and especially the European Directive 95/46/EC, for the protection of personal data will be strictly followed when addressing the ethical questions of SHOW. Users will be primarily be involved in surveys (WP1, WP11, WP12) and user tests (WP11, 12) and secondarily in workshops, events, and focus groups.

Pilots in SHOW will be conducted in 20 cities across Europe across several phases. The Informed Consent mechanisms are discussed in this document, but an elaborate account and templates can be found in D18.1.

It is stressed that all SHOW users and stakeholders (e.g. operators, service providers, etc.) who will be recruited by the project will be able to give Informed Consent or a

guardian/ legal representative will be able to do on behalf of them, if this is required in line with the GDPR regulation. All types of users will be informed they are going to be part of research tests and will be also informed on the way their personal and performance data will be treated by the project.

To assure continuous monitoring and control of the project, an Ethics Board (EB) has been established, led by VTI, including Local Ethics Representatives by the test sites.

The objective of this deliverable is to specify and structure the ethical procedures to guarantee a sound and correct ethical treatment of human participants. The content of the deliverable is also aligned with the two pre-defined ethic requirements asked by the European Commission (ECHR) to be written for SHOW, the Requirement No. 1 and Requirement No. 3.

The next version of this Deliverable (D3.4) will present the national Ethics profile of each pilot site with reference to national legislation and guidelines, apart from the ones listed in Annex V. based on the completed Ethics controlling questionnaire (Annex II). Moreover, ethical issues in vehicle automation will be addressed after the project Key Performance Indicators (KPIs) (WP13, WP9) and evaluation framework (WP9) are set and will be presented in the second version of this Deliverable. In addition, based on the technological developments, further automation focus ethical issues, risks and aspects will be addressed in D3.4. The ethics approvals and final DPIA will be included in the final Ethics Manual (D3.5). The main data clusters and some of the evaluation material for the activities mentioned above will be available and any ethical treatments and data protection mechanisms will also be included in this version, on pilot and project level. Finally, a preliminary Data Privacy Impact Assessment (DPIA) will be conducted in collaboration with the data collectors and processors at each pilot site, the data manager, the project DPO (and local DPO), as identified in D18.2, the Data Management Plan (DMP) team (D14.2; ERTICO).

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2.0	28/05/2020	Peer reviewed version sent for submission.	Anna Anund (VTI)

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Abbreviation List

Abbreviation	Definition
ADAS	Advanced Driver Assistance Systems
CCAV	Collaborative Connected Autonomous Vehicle
CEN	European Committee for Standardization
DMP	Data Management Plan
DPA	Data Protection Authority
DPIA	Data Protection Impact Assessment
DPO	Data Protection Officer
DPP	Data Protection Policy
DRT	Demand Responsive Transport
EB	Ethics Board
ECHR	European Court of Human Rights
EEA	the European Economic Area
EGE	European Group on Ethics in Science and New Technologies
EM	Ethical Manager
ETSC	European Telecommunications Standards Institute
GDPR	General Data Protection Regulation (EU) 2016/679
ICO	Information Commissioner's Office
ID	Identification
IF	Incidental Findings
ISO	International Organization for Standardization

Abbreviation	Definition
IT	Information Technologies
ITS	Intelligent Transport System
KPI	Key Performance Indicator
LaaS	Logistics as a Service
MaaS	Mobility as a Service
OEM	Original equipment manufacturer
PIA	Privacy Impact Assessment
POPD	Protection Of Personal Data
PT	Public Transport
QM	Quality Manager
SES	Socio Economic Status
SME	Small and Medium-sized Enterprise
SSL	Secure Sockets Layer
TC	Traffic Control
UC	Use Cases
UN	United Nations
VEC	Vehicle Electric Center

1 Introduction

1.1 Purpose of the document

This Deliverable defines the Ethics code for carrying out research and development in SHOW and aims to deliver the ethical and data protection framework and policies with consideration for the ethical guidelines and legislation in Europe.

As a sound and correct ethical treatment of participants is of great importance for SHOW, any relevant processes and administered documents are monitored and managed by the SHOW Ethics Board (EB). EB is led by the Ethical Manager (EM) in collaboration with the coordinator and the technical manager. The purpose of the EB is to ensure that the planned evaluations and tests follow international and respective national regulation, but also to keep track on approvals and support partners if needed. The EB's structure and responsibilities are discussed in Chapter 2.

It is important to note that although Ethics and data privacy issues and policies are primarily related to evaluation and data collection/ processing activities, such as the pilots (WP9, WP11, WP12), they aim to govern all activities in the project that entail gathering feedback (e.g. dissemination activities, events, training, social platforms in WP15) or communicating with Partners (ethical code of conduct and communication within and outside the Consortium). The primary data sources will come for the pilot related activities (WP9-WP14), taking into consideration the data clusters and specifications that will be defined in WP9, the data relating processes for treating data[1] in WP11, 12, 13, and 14, but also even when only data sharing takes place to perform other activities (e.g. simulations in WP10).

A preliminary address of other activities anticipated data to be collected are presented per year can be found in Annex III. Data specifications and descriptions will be discussed in the Data Management Plan (DMP; 14.2 and consequent updates) as well as the involved treatment processes. Another part is to establish a Data Protection Policy for SHOW to ensure all Consortium members abide to all applicable Data Protection laws within the EU and if necessary, to the General Data Protection Regulation (GDPR). The Data Privacy Policy for the online tools, websites (incl. cookies), social media capturing tools and mechanisms, terms of use and supply will be prepared and will be available in D3.4.

The objective of this deliverable is to specify and structure the ethical procedures to guarantee a sound and correct ethical treatment of human participants and to ensure that the ethical and data privacy principles align with the GDPR guidelines as well as investigate -at a preliminary stage- if such need is anticipated and if it will arise.

The relevant ethical aspects that have been analysed in this document are mainly related to the ethical and safe conduct of pilots with participants and the proper use of the collected data as well as protection of data guidelines and policies. In specific, **Chapter 1** introduces the purpose and intended audience of the current document as well as the interrelations to other project work items, **Chapter 2** provides the Ethics policy of the project and describes the synthesis and role of the SHOW Ethics Board (EB). Moreover, it summarises the key ethical issues of SHOW, **Chapter 3** provides the first high-level description of the data privacy policy, which will be further elaborated in D14.2 'Data Management Plan' and **Chapter 4** concludes the document and

[1] Data treatment involves collecting, storing, sharing, analysing, and reporting data.

discusses the next steps. **Annex I** provides an Ethics checklist for Ethics responsible partners at each pilot to ensure that all necessary steps are taken to abide with the SHOW Ethics policy, **Annex II** provides the SHO Ethics controlling form template that will provide the means for collecting local regulations and practices from the participating test sites, **Annex III** presents an overview of various activities, apart from Pilots, which entail data collection, **Annex IV** includes the Data Privacy Impact Assessment (DPIA) template to be circulated to relevant partners and the results will be presented in D3.5, and **Annex V** gives a summary of relevant international and European Legislation and Guidelines.

1.2 Intended Audience

This document *SHOW Ethics manual & Data Protection Policy* addresses all parties in SHOW. Multi-faceted, small- and large-scale activities, demo and real-life testing, involvement of Partners and various stakeholders are some of the diverse characteristics of SHOW activities involving data gathering that can fall into three major categories:

- Qualitative, quantitive, subjective and objective data collection through pre-demo and real life demonstrations, focus groups, online surveys, workshops, ideathons, hackathons, events, interview, fora, and research teams involved;
- Consortium members and most importantly those being involved in testing, actively participate in data management (of the SHOW data flow but also of the pilot data that will be drawn in the first Data Privacy Impact Assessment (DPIA) presented in D3.4), treatment, analysis and reporting, as well as communication;
- Partners involved in the development of engagement, incentivisation and recruitment strategies; to ensure ethics code of conduct are considered and applied;
- The Ethics Board (EB) in relation to approvals and monitoring.

Both the Ethics and Data protection policies will be directly applied in the WP1 and WP9 activities in close collaboration to the Data Management Plan (DMP; WP14) and respective Data Privacy Impact Assessment (DPIA), which will be conducted during the lifetime of the project.

1.3 Interrelations

The document is the Ethical manual for SHOW and together with EC Ethics requirement described in D18.1 (POPD – H – Requirement No. 1) and D18.2 (POPD – Requirement No. 3) it sets the basic for the work in pre-pilots (WP11) and Demonstrations activities (WP12), but also in other developments were humans are involved. The following diagram (Figure 1) presents the most distinct interrelations. Connections between other WP activities imply communication and sharing of data, results, and reports. The work related to services (WP6), vehicle systems (WP7) and infrastructure (WP8) are not directly related to the Ethics, however, any conduct with external service providers should remain ethical and any data provision for the functioning of the systems should comply with the data protection policy of the project. The same holds true with the internal sharing of data, namely with WP10 and WP3.

The Early connection to the Data Management Plan (D14.2) and the technologies for large-scale data collection (WP5) in Figure 1 allows for harmonization of efforts. Apart from the tests with humans, it sets the foundation for any type of interaction with

humans inside and outside to the project to be ethical (e.g. collection of input during dissemination activities, WP1 survey, social media feedback). It also identifies any data collection processes and activities within the project and pinpoints that the SHOW Ethical policy applies to them.

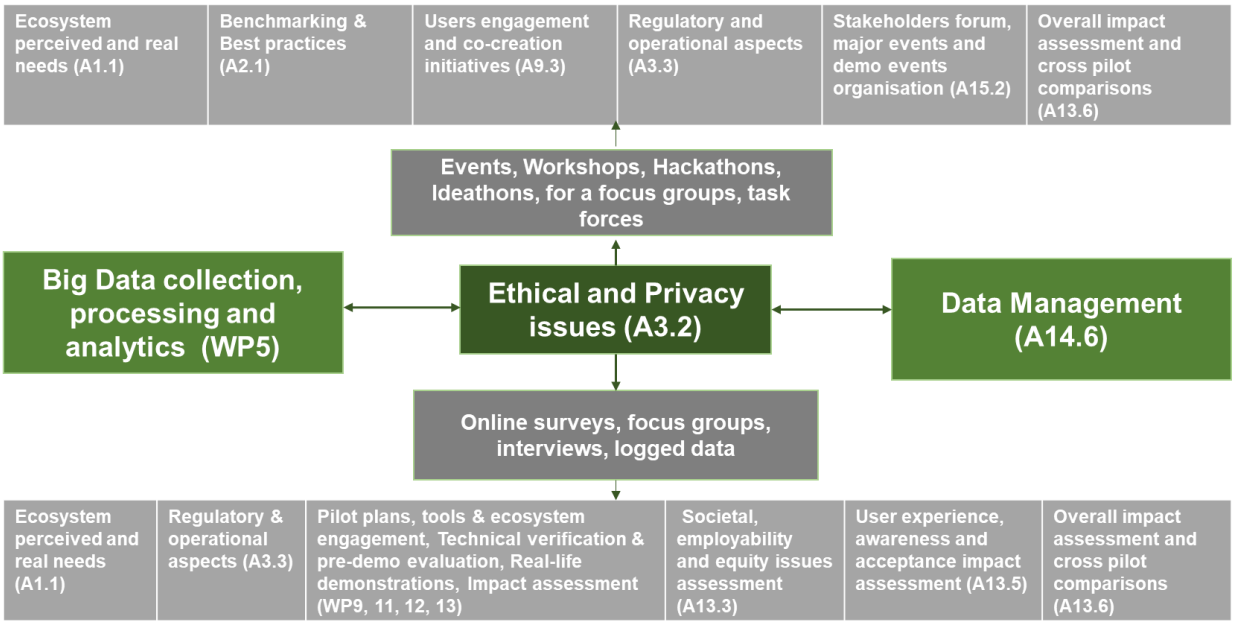

Figure 1: SHOW Ethical and Privacy issues interrelationships

1.4 The Pilot Sites

In total 15 countries and 20 cities will be involved in Demonstrations activities. The following table (Table 1) presents the countries and cities included in the Mega, the Satellite and the Follower sites.

Table 1: Countries and cities per Site type

Mega	Satellite	Follower
• France, Rouen and Rennes • Spain, Madrid • Austria, Graz, Salzburg, Vienna • Germany, Karlsruhe, Mannheim and Aachen. • Sweden, Linköping and Kista	• Finland, Tampere • Denmark, Copenhagen • Italy, Ispra • Greece, Trikala • Netherlands, Eindhoven (Brainport) • Czech, Brno	• Belgium, Brussels • Greece, Thessaliniki • Switzerland, Geneva

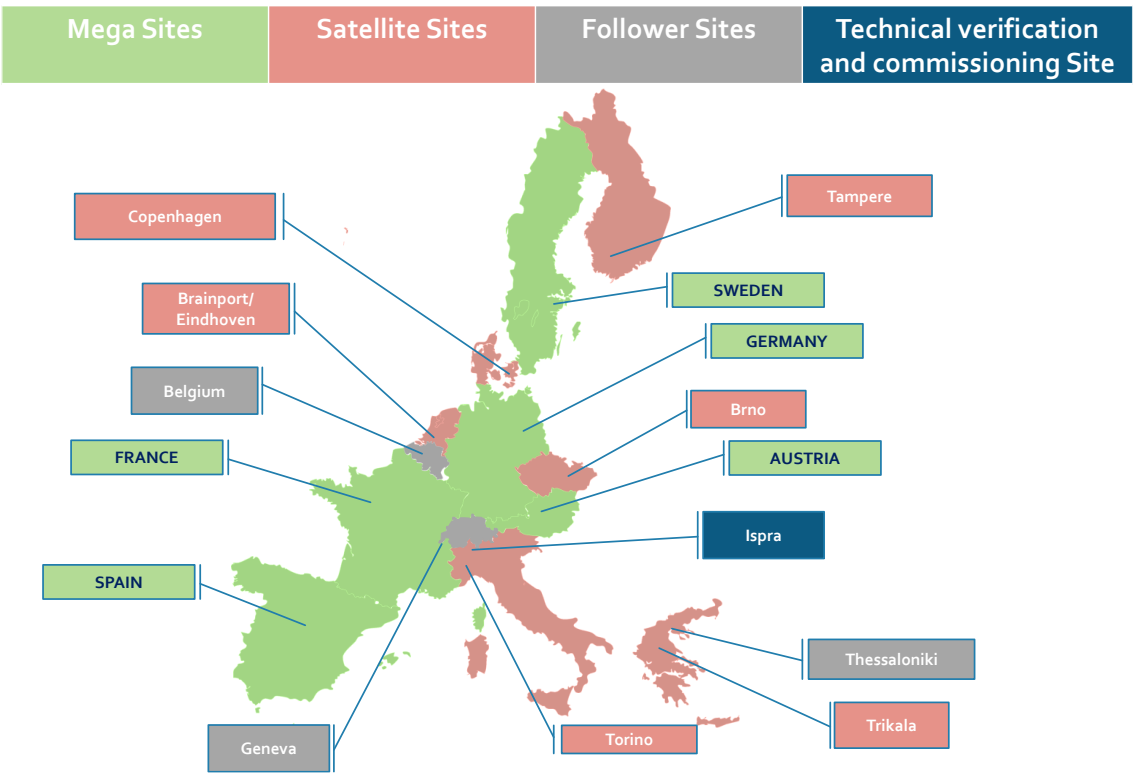

Figure 2: Mega Sites, Satellites and Parallel sites in SHOW.

All countries abide to relevant EU legislation, directives, and guidelines (in Annex III). However, national, regional, and organizational laws and guidelines are certainly in place and they will be investigated in the next version of this Deliverable through the completion of an Ethics controlling form (a template can be found in Annex II).

1.5 User groups

SHOW targets citizens as travellers who are using the SHOW land transport modes. But will also include other stakeholder groups.

Traveller groups:

- Employees at pilot sites (for pre-demo activities)

All types of travellers using public and private transport, including people with disabilities (for real-life activities), where in the large-scale will be no recruitment or control in the participation process.

Stakeholder categories:

- OEMs and transport/mobility operators;
- Tier 1 suppliers, telecom operators, technology providers, SMEs;
- Research & academia;
- Passengers and other road users encompassing VEC;
- Umbrella associations;
- Road operators, Authorities (Cities, Municipalities, Ministries) & policy makers.

These user and stakeholder groups have been identified and will be defined in D1.1 and will be further refined in D1.2 ‘SHOW Use Cases’ (M9), where the Use Cases (UCs) will be described

2 Ethics policy

2.1 Scope and key points

SHOW demonstration and innovation activities will be continuously monitored by the EB of the project, led by the Ethical Manager (EM). SHOW will strictly follow national legal and ethical requirements of the relevant directives where the research is performed. The **key points of the Ethics policy** that constitute the SHOW Ethics Code of Conduct of Research are the following:

- **Ethics control and monitoring:** All SHOW Pilot sites and cross-test site entities that will participate in the project have nominated a Local Ethics Representative that will be supervised by the Ethics Board of the project and will be obliged to comply with the Ethics Policy of the project, the European and national/regional regulations and practices and report back to Ethics Board about all relevant activities, their compliance as well as any problems that may arise respectively. The means to do so will be the Ethics Controlling Reports, a template is annexed to this document (see annex II). A summary of each pilot site will be obtained and the information will become the Ethics profile of each pilot site. In addition to the SHOW Controlling Report, ethical approvals will be obtained in the Pilot sites they have obligation to do so.
- **Personal data protection:** No personal data will be centrally stored, without anonymisation. No identification data will be available to pilot sites. In case of pseudonymisation, only one person per site (Local Ethics Representative) will have access to the relation between participant's code and identity, in order to administer the tests. However, this decision will be made when the evaluation plans will be available (WP9). One month before the end of the project, this reference will be deleted, thus safeguarding any future misuse of the data. More on Data Management policy in detail will be discussed in the Data Privacy policy (Chapter 3) and in D14.2 'Data Management Plan' and subsequent Deliverables.
- **Reimbursement:** All participants will be strictly volunteers. In case of recruited participants, the appropriate reimbursement mechanisms will be set in place. These mechanisms will be approved by the EB before they can be administered. In the cases where reimbursement incentive is foreseen, claimants (research interviewees) should be made aware of the status of the payment in opt-out letters using the following terminology: 'If you do take part in the face-to-face discussion/trial/survey, you will receive XX € in cash, as a 'thank-you' gift for your help with this study. This will not affect your entitlements to benefit in any way. In general, it will be avoided to apply reimbursement in the form of incentive payment. The incentivization strategies will be decided and described within WP9 Deliverables.
- **Informed consent:** Recruited participants will be provided with informed consent forms. Informed Consent is needed to be obtained for personal data and audio records management. In the case of real-life travellers that will not be specifically recruited by SHOW partners, informed consent will be digitally obtained accompanied by a short digital privacy disclaimer (will be included in D3.4). As consent is a process, then an elaborate account is provided in D18.1 as a separate document, accompanied by different consent templates. **However, the informed consent process, either for recruitment or for testing, remains an integral**

part of SHOW Ethics policy. These templates will be re-visited and adapted before any testing takes place. They will be also reviewed by the Ethics Board. Each pilot site representative is responsible to ensure the correct translation and adaptation of all relevant consent forms as well as their safekeeping.

- **SHOW policy on privacy, transparency, confidentiality and risk assessment and acknowledgement to the participants of SHOW studies:** Each pilot site responsible should explain the following to recruited participants. If possible, this should be done in the context of training workshops to be organised before the trials' beginning. If this is not possible, all following should be explained to each participant individually before the beginning of the trials and before signing the consent form. Explanation will be provided both verbally and in writing. In the case of real-live travellers, if consent is necessary, it will be obtained by ticking a box. As such, SHOW pilot participants should acknowledge the following points in the context of the Informed Consent and the accompanying Information Sheet in both written and verbal form (D18.1 includes an in-depth account and respective templates):
  - **General scope of SHOW and short reference to its objectives**.
  - **Scope and short description of the Pilot and the respective study**.
  - **Value of participation.** The supervisor will explain the benefit of the participation to the project, i.e. how it will assist in the research realised in the project and why the participant should consider joining this study as a research participant (benefits for the participant and the public in general).
  - **Acknowledgement of research results.** SHOW Pilot participants will be informed that the main results and outcomes of the Pilots will be shared with them and they be in an accessible format (e.g. odt, *.pdf, html, printed, in Braille, ...), if such requirement arises.
  - **Role of participant in the Pilots**. Participants will receive both verbal and written information and instructions (if needed) of their role in the Pilot and the tasks they have to complete, even if their role is not active but only obervational. The participant will be able to ask questions and receive answers to these questions. Only when the participant feels comfortable to start the testing session/ procedure, it will start and they will always have the right to withdraw and any point and time as well as decide what will happen with their already gathered data.
  - **Continuous support during testing.** The Pilot team members during testing will ensure participants feel comfortable and not coerced or tired. Questions are allowed during testing, in designated times. Participants should be informed about this possibility beforehand. The contact person details will be provided to the participant along any information and contacts in case the participants have any questions after the end of the testing session.
- **Risk assessment.** The major identified risk is related to invoking unrealistic hopes and expectations for personal benefits in terms of improved mobility. This will be counteracted by explicitly communicated information about the limitations of such personal benefit and harm. The Pilot plans will ensure no harm will be brought upon the participants and pre-testing activities will ensure that this will stay the

case. None of the Pilot related tasks (either in pre-demo or real-life Pilots) is anticipated to have any (side-) effects on the physical or mental integrity or health of the participant, other than the ones existing in their everyday travelling activities. As diverse user groups are addressed (travellers including potentially disabled, older citizens, young people, and various stakeholders, such as operators, service providers, etc.), all sites will internally review the Pilot plans and will reach a decision on the inherent risks for all possible addressed user groups. Harm is not anticipated in any way, but the Pilot site representative will ensure that they will explain the situation to recruited participants, i.e. f there any kinds of harm that could be experienced during the trials and what are the measures that have been taken in order to prevent that and reduce any such chances. In SHOW, and since the scheduled testing does not imply any kind of harm for the participant, it would be enough if the supervisor assured the participant for their safety and security. Also, when there are safety related issues (i.e. in-vehicle information and scenarios of use) all necessary precautions will be taken. In all cases, the test sites will abide with the internal and/or national safety regulations applying in their sites. All the pilot project leader has established internal company quality assurance procedures according to the ISO9001 norms, which will be adopted to guarantee high level quality in SHOW activities.

- **Communication with participants.** Communication with participants should abide with fundamental human rights principles. Participants should not feel coerced, threatened, stressed by researchers.
  - **Deception.** Researchers do not deceive by any means prospective participants about research that is reasonably expected to cause physical pain or severe emotional distress. Researchers explain any deception that is an integral feature of the design and conduct of an experiment to participants as early as feasible, preferably at the conclusion of their participation, but no later than at the conclusion of the data collection, and permit participants to withdraw their data. No deception will take place in SHOW Pilots and the user will be informed at all evaluation stages about the objectives and the procedures related to the pilots and how their data will be handled, processed, and stored. In the case a functionality of a service is emulated, they will be informed beforehand (in the context of “Scope and short description of the Pilot and respective study”), but they will be asked to perform and react as the situation was real.
  - **Debriefing.** Researchers provide a prompt opportunity for participants to obtain appropriate information about the nature, results and conclusions of the research, and they take reasonable steps to correct any misconceptions that participants may have of which the researchers are aware. The debriefing must be documented and will be signed by both sides. Summaries and copies of research reports will be given to research participants in appropriate accessible formats (e.g. larger font size, use of simple text accompanied by photographs, oral communication, etc.) and communicated through dissemination channels (e.g. the website, social media, etc.).
- **Free withdrawal**. Participant is assured that even if the consent form was signed prior any testing takes place, they can change their mind and withdraw at any moment before the scheduled end of the session. Relevant text is included in the consent form, which will be signed twice with one signed copy provided to the

participant. It will be made explicitly clear that no penalty or loss of benefits (if relevant) will occur because of either not participating or withdrawing at any time of the session.

- **Acknowledgement on video/sound recording sessions and screen capturing facilities (if applicable).** It this is applicable, written consent is obtained before the session starts with a dedicated type of consent form (annexed in D18.1). If the participant does not agree to this, none of the above will take place.
- **Assurance on secure handling of private data.** (data touching upon the identity and private life of the individual are personal– respective statement has been included in the Informed Consent annexed in D18.1) as acknowledgement of the SHOW data protection policy (Chapter 3). In case private data are collected, even if they are anonymous or pseudonymised, will not be permanently stored but only for the duration the analysis and reporting requires so, which in no case can be longer than the duration of the project (i.e. 3 years). The participant is informed that anonymised data are presented only in consolidated form. The aim of the project is to collect anonymous and no private data, but the following approach will be followed in case the opposite happens, as the Ethics and Data protection policies have to address and cover all possibilities in data occurrence and treatment, as the evaluation instruments and materials are not available yet. In such case, the following approach is adopted:
    - All participants will provide the information mentioned above to a single person at each pilot site, to be stored in a protected local database (to allow contacting them further and arranging with them the sequence of the current or future tests). The contact person will issue a single Test ID for each of them. This person will not participate in the evaluation and will not know how each user behaved.
    - The name, contact details (telephone, e-mail) will be kept in the database only for the duration of the project (if it is deemed necessary).
    - Such data will not be communicated to any other Partner or even person in each pilot site. Once the project ends, they will be deleted.
    - Since personal data will be deleted after the end of the project, no follow-up studies with the same people will be feasible.
    - For the statistical analysis, the answers provided by the participants will be associated with their type of impairment (if any) or travel behaviour and pattern (common origin-destination paths), age, gender, etc. However, each month, and during the project, the anonymised data will be randomised.
    - The Local Ethics Pilot Responsible will be trained (by the Ethical Board) at each test site, to monitor and guarantee that the relevant procedure is strictly followed and that all local Ethics Committee recommendations and national relevant laws are being respected.

The Consortium shall implement the research project in full respect of the legal and ethical national requirements and code of practice and will achieve that using the Local Ethics Representatives and the Ethics Controlling Reports. Whenever authorisations

must be obtained from national bodies, those authorisations shall be considered as documents relevant to SHOW. Copies of all relevant authorisations and approvals shall be submitted to the Commission prior to commencement of the relevant part of the research project. The Ethics Policy of the project will be continuously monitored and updated in two instances (M12 and M24). Future updates will take into consideration the Ethics Controlling Reports outcomes. SHOW Ethics policy will be shared with the Local Ethics Representatives in the form of guidelines to have as a guide while organising/conducting the tests. After each evaluation round, level of abidance to the Ethics Policy will be confirmed. Finally, it should be highlighted that according to the Ethics policy, all target end-user groups have to be sufficiently represented and be given equal opportunities for trying the SHOW solutions, whereas balanced gender representation should be also attained (see section 2.12).

The SHOW Ethics policy also covers:

- A clear description of the Ethics Board (EB), their participants and their roles in Section 2.2 (*part of Ethics controlling and monitoring*).
- A clear description of the Code for Conduct of research integrity.

The SHOW project includes Mega Sites, Satellite Sites and follower sites, see **Fel! Hittar inte referenskälla.**~~**Fel! Hittar inte referenskälla.**~~. Further annotations with regards to ethical processes per pilot site will be made in D3.4 to visualize the potential risks per site (i.e. any delays in the ethics approval process than would potentially risk the pilot conduction timeline, depending on the requirement (or not) for ethical approval per site).

2.2 The SHOW Ethics Board

Involvement of human participants is central and ethical in SHOW in every stage of their involvement through the lifetime of the project across Pilot sites. Pilot activities and the overall ethical conduct of the project will be supervised by the SHOW Ethics Board[2] (AB; A3.2: Ethical and privacy issues). The responsibilities and structure of the EB in relation to Ethics is discussed in this section.

Collaboration with external members (e.g. regional /municipality authorities) will be sought to ensure the Board is making decisions that are in harmony with the ethics profile and agenda of the city and area that will act as a Pilot. The second Ethics (D3.4 'SHOW updated Ethics manual & Data Protection Policy and Data Privacy Impact Assessment'; M12) and third (D3.5 'Final SHOW Ethics manual, Data Protection Policy and Data Privacy Impact Assessment'; M24) Deliverables will be drafted in consultation with EB, acting as supervisors of the ethical activities of the project and considering both European and national ethical and legal requirements, as it will contain the final Ethics and Data privacy policies of the project.

The EB will scrutinize the research, to guarantee that no undue risk for the user, neither technically nor related to the breach of privacy, is possible. Thus, the Consortium shall implement the research project in full respect of the legal and ethical national requirements and code of practice.

The procedures and criteria that will be used to identify/recruit research participants will be kept on file and submitted on request. Furthermore, the informed consent

[2] The SHOW Ethics Board (EB) is referred as Project Ethics Board (PEB) in DoA and they refer to the same Board.

procedures (see 18.1) that will be implemented for the participation of humans will be kept on file and submitted on request. The templates of the informed consent/assent forms and information sheets (in language and terms intelligible to the participants) can be found in D18.1 and for this reason they are not included in this Deliverable.

All used assessment tools and protocols within SHOW pilots will be verified beforehand by the EB with regards to any users' well-being before they are used during conduction of tests. EB works for implementing and managing the ethical and legal issues of all procedures in the project, ensuring that the team provides the necessary participation in SHOW and its code of conduct towards the pilot participants. Ethics issues will be tackled by the EB if the local ethical representatives cannot resolve them. In the latter situation, they must share the issues with the EB. In addition, any issues related to use of automated vehicles, trust, and awkwardness of using a technology for the first time and never used in the past will be addressed and resolved by the Ethics responsible partners at site. Such issues along with latest Ethics related issues to automation will be addressed in the next Deliverable of the series (D3.4; M12).

Main responsibilities of EB in relation to Ethics:

- Ensure all project activities are conducted in line with project's ethics code.
- Ensure the project's Ethics policy complies with European and national regulations.
- Resolute any potential ethics related conflicts and mitigate risks.
- Address any potential issues and risks.
- Approve the Ethics related Deliverables.
- Train and monitor the Local Ethics Representatives.
- Raise any ethics issues related to automation and resolve in collaboration with pilot site responsible partners.

The SHOW Ethics Board (EB) will be responsible for the project's ethics management and will act as supervisors of the ethical activities of the project. They will do so considering both European and national ethical and legal requirements. They will also collaborate with external members (e.g. regional /municipality authorities) to ensure the Board is making decisions that are in harmony with the ethical profile and agenda of the cities and areas that will act as a Pilot sites.

The profile of a member of the EB is defined as follows:

- Responsible for a test site;
- Experience in data collection and/or data management with humans involved;
- Experience in preparation and submission of ethical proposals and handling of approvals including compliance to GDPR in relation to testing of preferable automated vehicles.

The EB structure is presented below (Figure 3).

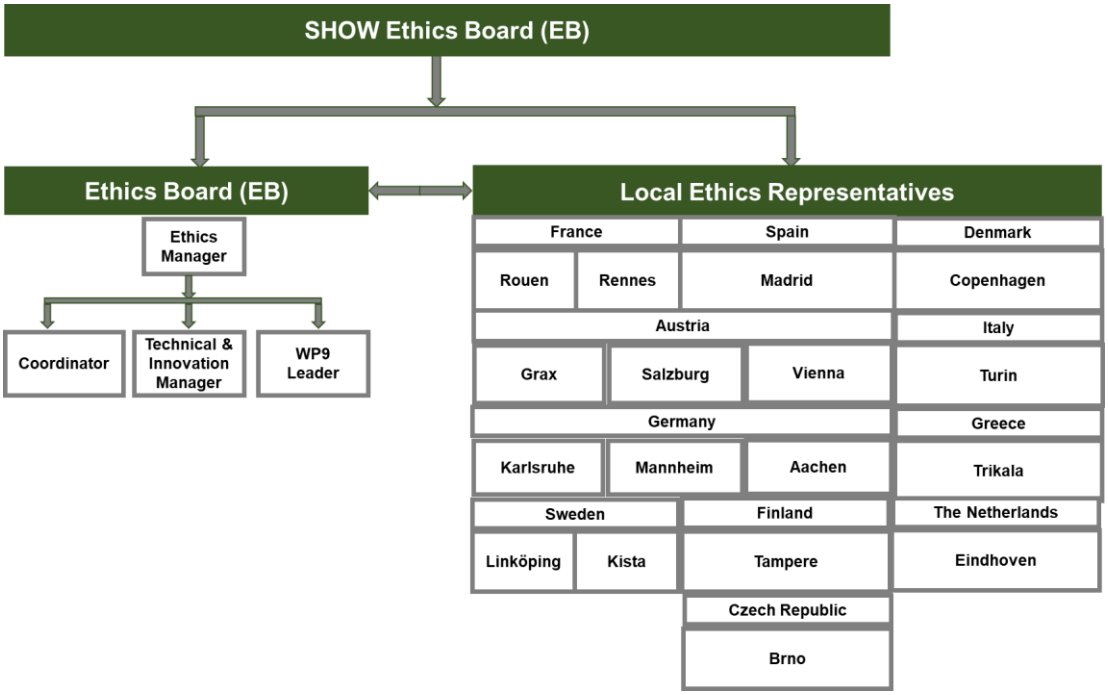

Figure 3: SHOW Ethics Board (EB)

The core Ethics group members are:

Ethics Manager: Dr. Anna Anund (VTI)

Coordinator: Mr. Guido Di Pasquale (UITP)

Technical and Innovation Manager: Dr. Evangelos Bekiaris (CERTH)

WP9 leader: Dr. Anna Anund (VTI)

Local Ethics Representatives will be the main contact point for any ethics related issues (e.g. submission of research/test protocols for approval, by the Institutional/National Ethics Committees, GDPR, etc.) from the pilot site point of view. Their role will be to comply with the SHOW Ethics Code of Conduct of Research and report back after each pilot round by means of an Ethics Controlling Report (see Annex II) across all issues that will be defined by EB and will tackle user involvement, ethical and data protection issues. In addition, one of the main tasks of the nominated persons will be to coordinate and be responsible for obtaining approval by the local/regional/institutional ethics committee before any pilot related activities take place (e.g. even before recruitment starts), if needed. Any required or requested authorisations and approvals remain official project documents at any time and they will be annexed in D3.4.

An Ethics Site Responsible has been chosen for each pilot site (local ethics representative), who represents the country with respect to ethics issues in specific. In case the pilot site managers decide to place another person in charge of ethics, then the table below will be updated. EB will train and monitor the Local Ethics Representatives to abide to the European and national regulation, laws, and guidelines and SHOW Ethics Policy. In turn, the ethics responsible person at each pilot site will train and appoint the person who will be managing and organising recruitment processes and safekeeping of participants contact details. The ethics responsible

person will inform the EB of any recruitment issues and threats that may appear with regards to data protection and end-user involvement in pilots.

Training delivery (face to face, online remote, documentation sharing, etc.) to the local ethics representatives will be managed case by case. SHOW EB will be also closely collaborating with the WP9 pilot leader who will act as the moderator and communicator between the pilot sites and the project's EB team.

The Ethics Board is obliged to obey the national and European legislation and code of practices and has to fully support and scrutinize any plans, operational documents, and research protocols to guarantee that the Ethics policy is applied in all activities and foremost when and where users are involved. Partners should ensure timely submission of research protocols based on their previous experience with relevant bodies to avoid any delays in the pilot's instantiation.

The EB consists of one representative from each city involved as a Mega Site city or Satellite, see Table 2.

Table 2: SHOW Ethics Board (EB) Members

Site number	Country	City	Person	Email:
1	France	Rouen	Sam Lysons	sam.lysons@transdev.com
2	France	Rennes	Isabelle Dussutour	isabelle.dussutour@id4car.org
3	Spain	Madrid	Montserrat Luque	montserrat.luque@emtmadrid.es
4	Spain	Madrid	Lucía Isasi	lucia.isasi@tecnalia.com
5	Austria	Grax	Joachim Hillebrand	joachim.hillebrand@v2c2.at
6	Austria	Salzburg	Markus Karnutsch	markus.karnutsch@salzburgresearch.at
7	Austria	Vienna	Martin Oedendorfer	martin.oedendorfer@wienerlinien.at
8	Germany	Karlsruhe	Dr. Alexander Viehl	viehl@fzi.de
9	Germany	Mannheim	Georg Hertweck	g.hertweck@rnv-online.de
10	Germany	Aachen	Isabell Pitre	isabelle.pitre@mail.aachen.de
11	Sweden	Linköping	Anna Anund	anna.anund@vti.se
12	Sweden	Kista	Jan Jansson	jan.jansson@keolis.se
13	Finland	Tampere	Pekka Eloranta	pekka.eloranta@sitowise.com
14	Denmark	Copenhagen	Anette Enemark	aen@moviatrafik.dk

Site number	Country	City	Person	Email:
15	Italy	Turin	Brunella Caroleo	brunella.caroleo@linksfoundation.com
16	Greece	Trikala	Christina Karamperi	xkaraberi@e-trikala.gr
17	The Netherlands	Eindhoven	Tariq Van Rooijen	tariq.vanrooijen@tno.nl
18	Czech Republic	Brno	Tomas Haban	tomas.haban@cdv.cz

In a nutshell, the SHOW EB has a duty to:

- **Abide** to the Ethics and data privacy policies of SHOW.
- **Oversee** the ethical concerns involved in the project and the ethics approval processes at project level.
- **Protect** private and sensitive information and ensure that participants will not be harmed during the pilots.
- **Respect** participant's free will and treat them as intelligent beings who decide for themselves about any type of gathered data that are indeed outcomes of their participation.
- **Inform** in full about which data will be collected and how data will be collected, processed, shared, and disposed before signing the consent form.
- **Communicate** any relevant issues to the Ethics Board and the project management team to ensure these issues will be timely and effectively addressed, managed and resolved.
- **Ensure** ethics approval (wherever is applicable) is obtained on time and relevant documents are shared with the EB.
- **Communicate** their findings through open-access journals to other researchers and academic communities (especially true if it is requested by the funder).

All used assessment tools and protocols within SHOW pilots will be verified beforehand by its EB, regarding their impact to users' well-being before being applied to the pilot sites. The EB works for implementing and managing the ethical and legal issues of all procedures in the project, ensuring that each of the partners provides the necessary participation in SHOW and its code of conduct towards the pilot participants. The EB constantly updates the Ethics and Privacy Protection Manual (ethics code of conduct of research), leading to the recognition of key ethical and legal issues. Especially the core ethical issues will be tackled.

For each study, the EB will review and document issues in relation to the protection of human research participants by using the following questions. If National Ethical approvals are required, they will be stored at the collaboration tool in folder WP3/A3.2. It is the responsibility of the investigator of the study to make sure this is uploaded together with a separate document that in English gives an answer to the questions in the Ethics Application Form, see Annex I.

2.3 Ethical Management in SHOW

The diagram in Figure 4~~Figure 4~~ presents the procedure of ethical considerations from planning to realisation of a test or demonstration activity. The EB will supervise and ensure that the ethical guidelines of the project are followed, this is done in close collaboration with the WP9 - Pilot plans, tools & ecosystem engagement. The responsible partner and person at each demo site will be responsible for the submission and approval of the pilot research protocol to the local/regional and/or institute EB required in each country. The EB of SHOW is the one responsible for keeping track of the process through a dedicated checklist (see Annex I).

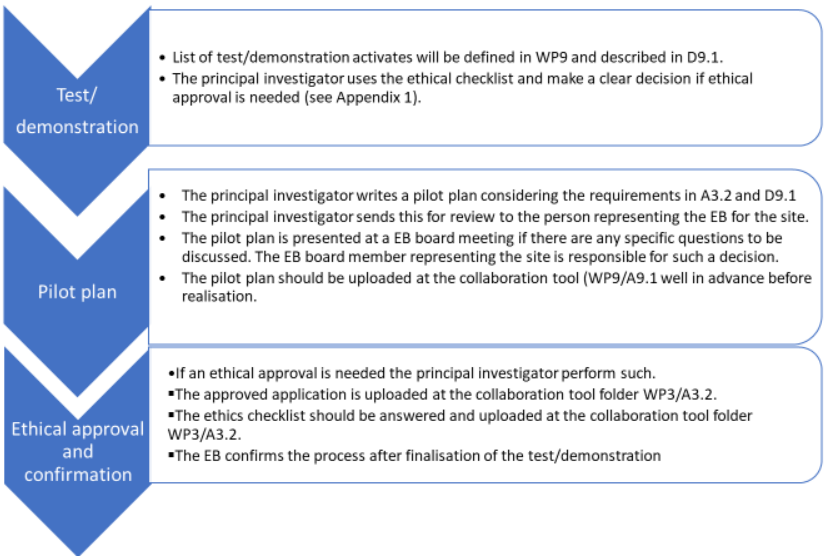

Figure 4: The procedure and flow of information from Ethics Board to pilot site

2.4 Risk assessment and mitigation strategy

It is not possible to conceive a procedure, investigation, or process which would be without any risk. One of the most important factors in the assessment of risk is the perception of the prospective participant of the importance of risk. The participant's life situation may substantially influence the way in which a risk is perceived. The end point of the process is the consent given by the person to be part of the research project, having considered all aspects of the process and asked all relevant questions.

All relevant information will be given to the participants. This means that the project SHOW will be carefully explained. The choice that is made and the consent that is given will be without coercion or undue pressure being applied.

Categories of risk:

- **Physical risks** stemming from traffic safety issues will be minimised and is expected to be at the same level as that experienced by the average traveller throughout their daily driving when in a hurry, fatigued, stressed, etc.
- **Psychological consequences** will be carefully examined.
- **Social inconveniences** will be minimised (no additional stress or different from stress experienced during daily living/driving/travelling conditions, cost reimbursement for additional transport costs, etc.).

Table 3: Preliminary considerations regarding Ethical Risk Management in SHOW.

Ethical & Social risks	Description	Ethical Risk Management in SHOW
Application of overarching Ethical and legal framework	All relevant legislation, regulation and ethical codes will be considered; they are defined how they are met in terms of processes, timing and responsibilities	SHOW Ethics and Gender issues' Board will oversee the ethical concerns involved in the project and the ethics approval processes at project level. Annex I includes the information required to be addressed and included in an Ethics application form partners might be required to obtain prior any testing takes place.
Transparency and consent of the travellers	The informed consent administration ensures that the user accepts participation and is informed about the project and pilot's objectives. Written consent is obtained after travellers are informed. Information provided is clear and understandable about their roles (tasks and rights), research objectives and methods applied, duration of study and participation (if they differ), confidentiality, safety and risk related issues as well as the benefit for them and the project. These aspects are managed in the next column (on the right) and are depicted in the informed consent form template (annexed in D18.1).	The basic parts of the SHOW informed consent will include: 1. The objective of the study, its duration and methodology; 2. Possible risks, discomforts and side-effects (also related to traffic safety); 3. Privacy and data protection procedures; 4. The possibility to decline the offer and to withdraw at any point of the process (and without consequences) 5. Information about the data controllers, processors and data manipulation in general; 6. Identification of data controllers and processors; 7. Contact person.
Privacy and data protection	Only anonymised data will be processed and, therefore, no personal data will be processed in relation to specific user. The name will not be connected to other characteristics (e.g. age, gender, nationality, health and/or mobility profile). Anonymous data handling falls under the European and national legislation for the lawful processing of personal data.	The project identifies which data protection rules apply and establishes a list of risks and potential solutions; taking due account of the following: – What kind of data will be processed? – What is the purpose of the processing? – Will the data exceed the purpose of the study?

Ethical & Social risks	Description	Ethical Risk Management in SHOW
	To avoid risks related to the processing of personal data such as identity theft, discriminatory profiling or continuous surveillance, the principle of proportionality has to be respected. Data can be used only for the initial purpose for which they were collected. Anonymisation or pseudonymisation is a way to prevent violations of privacy and data protection rules. Processing has to be limited to what is truly necessary and less intrusive means for realising the same end have to be considered.	– Are there procedures ensuring that data is processed only for the originally identified purposes? – Who is the owner of the data? – Is data connected to other information? – Will data be commercially exploited? – What is the duration of the storage of the data? – Where will the data be stored and according to which national legislation? – Who will access the data? Are they secured? – Will the user be recorded? – Which metrics will be implemented? – Who will supervise the data protection? These questions will act as a foundation for preparing the private data information consent form (see 18.2). The collected information will consequently feed the private impact assessment (PIA) process that will be managed by ERTICO within A14.6.
Safety & certification of autonomous systems/vehicles	Data collection and evaluation activities should not entail any undue risk for participants other than the ones they will encounter in their everyday travelling and living activities.	Existing technologies adhere to all current and relevant standards in the area (of ETSI TC ITS - Application Requirements and Services, ISO TC 204 - Intelligent transport systems CEN TC 278 - Intelligent transport systems, etc.) as they be collected and listed within A15.5. Further standardisation and certification aspects will be handled in the aforementioned activity.

Ethical & Social risks	Description	Ethical Risk Management in SHOW
		SHOW technologies will be verified, validated before actual deployment to pre- and real-life demonstrations within D11.1 'Technical validation protocol and results' and D11.2 'Demos safety, reliability and robustness validation and commissioning', respectively.
Participants' engagement	Research is expected to be inclusive and representative of different traveller types, especially in a dynamically shaped real-life context. The selection and recruitment of participants is a crucial part of the involvement process, as it will impact on the quality of the outcomes and the sustainability of the research outcomes. At this stage a satisfactory number of users and combination of travellers' characteristics is sought (i.e. to reflect and accommodate the needs of the chosen UCs); gender balance and equality are addressed.	SHOW will target specific travellers' groups. For the pre-pilots, participants will be screened prior recruitment. Adequate number of travellers will ensure sample representativeness, even at pre-pilot level, including: i) different age groups, ii) balanced female/male ratio iii) various social, cultural, and socio-economic (SES backgrounds). The Ethics and gender issues' Board will oversee the selection of participants. Participant engagement will governed by the guidelines defined by the Responsible Research and Innovation Framework*. *https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation

Further criteria and procedures regarding participants' recruitment might apply depending on the elaborated pre-pilot plans. These further criteria and procedures will be described in detail in a dedicated chapter of D9.2 'Pilot experimental plans & impact assessment framework for pre-demo evaluation'.

2.5 Health and safety procedures

For SHOW it is of high importance that during evaluation and demonstration activities appropriate Health and Safety (H&S) procedures on departmental/institutional abut also on regional/national level are followed. This include staff as well as external participants. The overview of the respective regulations for SHOW test sites is provided Chapter

5.1.5 of the Grant Agreement. It is up to each site to follow those regulations and provide evidence for thin upon request.

2.6 Partners role and responsibilities

The following project partner regulations related to compliance, approvals, privacy, personal health information and collaboration within the project shall apply:

1. Each party shall be responsible for ensuring its own compliance with all laws and regulations applicable to its activities. Such laws include, but are not limited to, those in respect of rights of privacy, intellectual property rights and healthcare.
2. Any party which provides any data or information to another party in connection with the project will not include any personal information relating to an identified or identifiable natural person or data subject.
3. To this end, the providing party will anonymise all data delivered to other parties to an extent sufficient to ensure that a person without prior knowledge of the original data and its collection cannot, from the anonymised data and any other available information, deduce the personal identity of individuals.
4. Each party shall be solely responsible for the selection of specific database vendors/data collectors/data providers, and for the performance (including any breach) of its contracts between it and such database vendors/data collectors, (to which no other project partner shall be a party, and under which no other partner assumes any obligation or liability) and shall further warrant that it has the authority to disclose the information, if any, which it provides to the other parties, and that where legally required and relevant, it has obtained appropriate informed consents from all the individuals involved.
5. Partners supplying special data analysis tooling, shall have the right on written notice and without liability to terminate the license that it has granted for such tooling to be used in connection with the project, if the supplying partner knows or has reasonable cause to believe that the processing of particular data through such tooling infringes the rights (including without limitation privacy, publicity, reputation and intellectual property rights) of any third party, including of any individual.

2.7 Ethics in relation to participants

All research should follow the Data Protection Policy of SHOW (see Chapter 3).

SHOW will not touch any of the following fields of research:

- research activity aiming at human cloning for reproductive purposes;
- research activity intended to modify the genetic heritage of human beings which could make such changes heritable;
- research activities intended to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer.

Furthermore, SHOW does not include any research involving

- the use of human embryonic tissue, human foetuses, human foetal tissue, other human tissues;
- genetic information;
- pregnant women;
- animals.

As SHOW Pilots operate under real environments (with an estimated total of 1,500,000 passengers participating in them over the course of the 12 months, across all 20 cities in Europe), they cover the needs and consider the preferences of all types of travellers.

Nevertheless, specific use cases and test environments (around schools, universities, hospitals, airports, warehouse depots, etc.) take place; to research specifically the needs and wants of target user clusters including among other commuters, tourists, students and the elderly and people with mobility restrictions. Finally, the integrated transportation chain nature of SHOW Pilots and their connections to major city hubs (rail stations, etc.) allow for proper coverage of multimodal travellers' needs.

Traveller groups and involved stakeholders will be recruited and invited, respectively to participate in dedicated and controlled activities during the conduction of the pre-demonstration tests, as they will be defined within D9.2. All participants will have the competence to understand the informed consent information.

Recruitment of participants will take place only in the pre-pilots and vulnerable road users will probably participate depending on the pilot plans, specifications, requirements and criteria. Vulnerable road users (VRUs) are considered "*by the amount of protection in traffic (e.g. pedestrians and cyclists) or by the amount of task capability (e.g. the young and the elderly). Vulnerable road users do not usually have a protective 'shell', and also the difference in mass between the colliding opponents is often an important factor. Vulnerable road users can be spared by limiting the driving speed of motorized vehicles and separating unequal road user types as much as possible*" (SWOV Vulnerable Road Users Fact Sheet, 2012).

Vulnerable users (i.e. homeless, drug and alcohol users and abusers, immigrants, etc.) will not be recruited to participate in any controlled pilot tests across pilot sites that are conducted by the SHOW Consortium. However, during the demonstration activities, participants will not be recruited, and people will freely use the vehicles, as they would normally do during their daily and/ or frequent mobility activities. The SHOW Consortium will have no control and will not be aware of who is using the vehicles; still, in any case, no personal data will be collected by the passengers. For real operation in demonstration activities, the same regulations that already stand and are applied by the operators (concerning the protection of human rights, etc.) will be also in force for the case of SHOW.

The substantial number of users will ensure a wide trial perspective, including: i) different age groups, ii) balanced female/male ratio, and iii) various social backgrounds. The EB of SHOW will oversee the selection of participants.

2.7.1 Ethics in research with children

Children are addressed as a user group within SHOW, hence partners must familiarise with and abide ethical guidelines pertaining specifically to children, which have been developed by a number of organizations. These guidelines vary somewhat, depending

on the value basis for the research in different organizations. The core principles are as follows:

- Having a commitment to children's well-being **(Beneficence)**;
- Having a commitment to doing no harm **(Non-Maleficence)**;
- Having a commitment to children's rights including the right of individuals to take responsibility for him or herself **(Autonomy)**;
- Being child-centred in its approach to research, listening to children, treating them in a fair and just manner **(Fidelity)**;

These principles have implications for decision-making in several key areas, including consent and confidentiality, but also in the general manner in which children are treated in any research encounter.

Child information and consent

Children must be informed as fully as possible, given their age and competency, about the nature of the study and the methods, at the outset of data collection. Information for children must be written in clear and simple language. It must be visually attractive and accessible. It must be read to children. Children must also receive a written copy to keep. A child's right to refuse to take part must be respected. This applies even if parents or other caregivers/guardians have given consent. It must be explained to children that they may choose to discontinue the session if they are not comfortable with continuing. Appropriate signals must be agreed. The issue of whether children must be asked to provide written consent is a grey area. Parents may object, on the basis that it might not be meaningful for children. In some circumstances, however, it may help to make consent more meaningful for children to ask them for their written consent. In all cases, it is advisable to obtain verbal consent, if possible, in the presence of a third party (adult) who is known to the child.

In case a consent form is needed, the consent form will be provided in a format understandable by the children of the targeted age group and, in case of a learning or mental disability, the content and layout will be adapted, respectively.

This holds true for any oral and/or written consent obtained throughout the lifetime of the project. Representatives of vulnerable road user groups (e.g. older citizens, users with cognitive difficulties and disabilities) will receive consent information in a format they understand and can respond.

Dealing with issues of consent

Written consent must be obtained from parents, in cases where children are under the age of 18. Consent from children can be either written or verbal. All consent must be informed and voluntary. Records must be kept of all steps taken about consent.

Parent/Guardian/Legal representative information and Consent

Written information for parents/guardians must include:

- A description of the nature of the study and methods involved.
- Information on how the child/family was selected for participation.
- Information on how the data will be stored and who will have access to it.
- Information on how the data will be used.
- Information on the ethical/safety requirements of [*pilot site premises*] to which researchers must adhere. This includes information on the limits of confidentiality.

Researchers will be asked to show evidence of parental consent for research conducted with children before proceeding with data collection. Parents must be given a copy of the consent form to retain for their own use.

Legal representative's role in obtaining consent for minors and adults that cannot prive consent.

A professional legal representative may be approached if no suitable personal legal representative is available.

Minors

Under the regulations a minor is a person under the age of 16 years. The regulations prescribe a hierarchy for determining who must be approached to given informed consent on behalf of a minor prior to their inclusion in the study (i.e. pilot and user testing at each SHOW pilot site). The provision of informed consent by a legal representative only apply in the case of emergency treatment where no person with a parental responsibility.

1. Parent. A parent or person with parental responsibility

2. Personal legal representative. A person not connected with the conduct of the study who is suitable to act as a legal representative by virtue of their relationship with the minor, and available and willing to do so.

3. Professional legal representative. A person nominated by the relevant healthcare provider who is not connected with the conduct of the stud Relevant consent/assent form templates can be found in D18.1.

2.8 Incidental findings

They are defined as the findings that maybe by-products or outcomes of the study that were not necessarily collected to answer the main research questions and objectives but could be of importance for the physiological, psychological and metal wellbeing of the participant. The number and type of incidental findings could be different for each site and valuable for both the person and the other stakeholder groups.

Any findings that are related to driver's traffic rules' violations during the tests will not be communicated to 3rd parties (including insurances, authorities, etc.); as the driver is driving "as he/she will do when along" and assumes fully legal responsibility on his/her acts. Written exception, if such exists, will be made for deliberate criminal acts on behalf of the driver or/and related to an eventual accident during the tests.

Health decrements identified in a person during a test will be communicated in writing to the test participant and only, supporting them to contact medical support if needed.

2.9 Incentive schemes

The participants may receive an incentive as compensation for their participation. It will not be conditional based on performance or restricted to finalisation of the actual test. The incentive will be in line with the performing partners general practice. Two levels of incentivisation is expected to be applied:

a) Incentives for real-life travellers, not specifically recruited by SHOW: Real-life travellers will be incentivised to use the services provided in SHOW through discounts that will be offered to them by the respective operators. This discount has been anticipated to be covered by the project in the sense of "compensation for evaluation activities' and has been allocated in the different pilot leaders of the corridor.

b) Incentives for participants specifically recruited by SHOW: As previously mentioned, there will be two (2) key clusters of pilot participants across the pilot rounds of SHOW; recruited participants in pre-demo activities and stakeholders. Both groups of participants will receive an incentive as compensation for their participation. It will not be conditional based on performance or restricted to finalization of the actual test. In general, it is not envisaged to give money to the pilot participants. The reimbursement mechanisms will be revisited by the Ethical Board and approved. Each Pilot site will define the incentives appropriate for the participants to be recruited according to the thresholds imposed by their national and institutional regulations. Many participants are anticipated in the Pilots and ensuring participation and attendance at follow-up sessions is – in some occasions – critical for not only the success but the everyday running of Pilots. It is a fine line between creating a culture of incentives when recruiting people and the SHOW Ethics Board will oversee and approve (or not) the incentive schemes chosen by each pilot site, apart from the research protocol approval by the local Ethics committee. Therefore, based on the evaluation plans appropriate incentives will be chosen. As commitment is essential for the success of the project, users will receive some form of reimbursement. In case of recruiting employees, incentives are not used as people are already paid for their time. Participants should be informed of the presence/absence of incentives when recruited and a statement needs to be added in the consent form. In case of legal restrictions or policies, the ethics responsible at each pilot site should inform the Ethics Board. An alternative to cash is using vouchers; sometimes it is easier for evaluation moderators to carry/use and they should be representative of the demographics (i.e. have an added value for older citizens). It is upon the discretion of each partner to decide the incentive scheme to use (if not to use). Other options include sharing the results of the study, making charitable donations, creating a prize draws and offer nonmonetary gifts.

2.10 Ethical Declarations and Conventions

The General Principles of the European Convention on Human Rights, the Convention of the Council of Europe for the Protection of Individuals with regard to Automatic Processing of Personal Data and especially Regulation (EU) 2016/679 (General Data Protection Regulation - GDPR) will be strictly followed when addressing the project's ethical questions. Relevant laws and directives, related to Core Ethical issues for SHOW covers the area of:

- Privacy protection and confidentiality
- Informed consent (for stakeholders and pre-demonstration travellers/participants)
- Data privacy but transparent data flow
- Traffic safety and secure/certified use of sensors/systems
- Risk assessment (Insurance)
- Delegation of control
- Incentives (financial inducements, etc.)

In Annex 4 of Grant Agreement the legislation and non-binding instruments to be considered by SHOW's Ethics Board are described. For the researchers the European Code of Conduct for Research Integrity is the framework for the work in SHOW[3]. Further relevant legislation and Guidelines can be found in Annex V.

2.11 Code of Conduct for Research Integrity

The work in SHOW follow the European Code of Conduct for Research Integrity (see foot note 1).

It is based around the principles:

- **Reliability** in ensuring the quality of research, reflected in the design, the methodology, the analysis and the use of resources.
- **Honesty** in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way.
- **Respect** for colleagues, research participants, society, ecosystems, cultural heritage and the environment.
- **Accountability** for the research from idea to publication, for its management and organisation, for training, supervision and mentoring, and for its wider impacts.

As a researcher, it is your personal responsibility to carry out your research based on good research practice following the context described in the Code of Conduct in Research integrity covering:

- Research Environment
- Training, Supervision and Mentoring
- Research Procedures
- Safeguards
- Data Practices and Management
- Collaborative Working
- Publication and Dissemination
- Reviewing, Evaluating and Editing

For a single researcher the safeguards shall be well known:

- Researchers comply with codes and regulations relevant to their discipline.
- Researchers handle research subjects, be they human, animal, cultural, biological, environmental or physical, with respect and care, and in accordance with legal and ethical provisions.

[3] https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

- Researchers have due regard for the health, safety and welfare of the community, of collaborators and others connected with their research.
- Research protocols take account of, and are sensitive to, relevant differences in age, gender, culture, religion, ethnic origin and social class.
- Researchers recognise and manage potential harms and risks relating to their research.

Research is a process of inquiry. In the procedures or design phase of a research project, the researcher must examine the research plans potential ethical issues and take steps to correct them and must do so prior to contacting any participants. The proposed research plan, and how it puts into practice, must survive ethical evaluation in advance; if an ethical problem exists, the researcher must modify the plan. Only when the plan can stand up to ethical challenges can the investigator to start or proceed to the next phase. Ethical researchers must address the issues of explicit and informed consent, confidentiality, safety, deception, debriefing, security and diversity in their research with human participants. It is the task of researcher to think these issues through in order to find out whether the participants will experience and perhaps react negatively on any of these issues.

2.12 Gender

The gender level of participation within the SHOW activities will be monitored. Equal opportunities and equal treatment between men and women will be guaranteed.

Over the years, the European Parliament has supported and called for measures to improve the position of women. This work continues through the activities of the Women's Committee. In detail, several specific European and UN Policies have been adopted to promote the equity of gender. Those will be fully respected within the project. The monitoring of the gender level of participation within the project activities is important for SHOW.

In more detail, there are several specific European and UN Policies that will be adopted to promote the equity of gender (i.e. Council Directive 75/117/EEC, etc.).

SHOW will ensure that during all its phases, and as much as possible equal gender participation will be maintained, this addresses research and development phases, as well as evaluation phases. The gender will be one of the Pilots and other test/evaluations participants' characteristics that will be tracked and statistically processed (to come up with any correlations if applicable).

3 Data Protection Policy

At this stage, the initial requirements are presented about the protection of personal data and for guaranteeing citizens fundamental rights and freedoms are respected as well as ensuring that project results are not misused. Ethics issues raised by SHOW are explicitly discussed in relation to personal data collection, processing, and re-use (i.e. secondary processing), and misuse, each of which is addressed in detail in this section. Below you may find the SHOW Consortium statement with regards to data protection and privacy statement:

"*The Parties agree that any Background, Results, Confidential Information and/or any and all data and/or information that is provided, disclosed or otherwise made available between the Parties during the implementation of the Action and/or for any Exploitation activities ("Shared Information"), shall not include personal data as defined by Article 2, Section (a) of the Data Protection Directive (95/46/EEC) (hereinafter referred to as "Personal Data") or under Article 4.1 of the GDPR. Accordingly, each Party agrees that it will take all necessary steps to ensure that all Personal Data is removed from the Shared Information, made illegible, or otherwise made inaccessible (i.e. de-identify) to the other Parties prior to providing the Shared Information to such other Parties.*"

These data handling processes will be addressed in a transparent privacy policy will be prepared as a separate chapter in D14.2 'Data Management plan' (and subsequent updates) that will explain how the recruited participants will be informed on how the project partners will collect, process and protect as well as inform potential participants about how they (potential participants) can ask their data to be deleted or rectified. In addition, it will describe all actions to be taken to ensure data protection. This process is like the process to be applied for informing actual participants, but both will be reported separately in the same Deliverable.

The project shall ensure the Consortium guarantees the treatment of personal data generated during the project. This will be done via a set development directives and methodologies. To ensure that secure systems development principles are integrated from the inception of the project best practices will be issues to RTD staff in the SHOW project to ensure the project applies adequate database encryption and secure systems techniques.

During the project, responsibilities will be clearly assigned for the overall management and control of research findings and the controlling of access rights. The person who will be responsible on issues for data security will directly inform to EB and the project coordinator. The research findings will be protected from malevolent/criminal/terrorist abuse by following strictly procedures, as they will be defined by the EB.

Furthermore, the Directives and mandates will also integrate the technical requirements of European, national and regional data protection legislation. Partners will be required to have adequate security measures in place, both technical (firewalls, access controls, access audits, etc.) and operational (training, incidence reporting, etc.) The following range of issues will be considered in establishing such Directives and mandates:

- Categories of sensitive data;
- Security measures for sensitive data;
- Policies for fair acquisition and processing of data;
- Data retention policies;
- Legal basis for the information processing;
- Policies for processing compatible with purpose;

- Policeis for Data Controller and Data Processors;
- Description of the technical characteristics of the data processed;
- Technical features and topology of the information systems where data is stored and processed.

3.1 Personal data handling

Data will be gathered with consideration for the following aspects and compliance to GDPR:

- **Confidentiality and data protection (data handling & ethics):** Participants, and the data retrieved from them (performance or subjective responses) must be kept anonymous unless they give their full consent to do otherwise.
  - Identifiable personal information should be encrypted (i.e. pseudonymisation and coding). Otherwise ethical approval is necessary specifically for this;
  - Pseudonymisation is preserved by consistently coding participants with unique identification codes. Only one person at each pilot site will have access to personal identifiers (if any). A Test ID will be issued for each of the participants, whereas the pilot site person that will collect and issue them will not have participated in the evaluation and will have not meet the test participants and their performance in the tests;
  - Everyone entrusted with personal information is personally responsible for their decisions about disclosing it;
  - Pilot site managers must take personal responsibility for ensuring that training procedures, supervision, and data security arrangements are enough to prevent unauthorised breaches of confidentiality.
- **Encrypted and pseudonymised data:** To mitigate the risks involved with processing personal data, personal data collected is encrypted or pseudonymised to the extent reasonably possible, so that individual cannot be identified. This is recommended by Article 32 of the GDPR. Pseudonymised data is data that can no longer be attributed to a specific data subject without the use of additional information, provided that such additional information is kept separately and is subject to technical and organisational measures to ensure that the personal data are not attributed to an identified or identifiable natural person. In line with Recital 26 of the GDPR, information which is encrypted or pseudonymised is still information on an identifiable natural person, even if on its face, an individual's identity is concealed by the encryption or pseudonymisation. Therefore, appropriate technical and organisation measures are also in place, together with other security measures as recommended by Article 32 of the GDPR and the GDPR as whole.

Only one individual in each research entity will hold the key to, or will otherwise be responsible for, any coding, pseudonymisation or encryption of the personal data collected by that research entity for purposes relating to the project's research. This individual will be separate from the core research team and will therefore have no direct interaction with the research participants and will not otherwise be involved in the project's research. Whilst the data is encrypted or pseudonymised to the research team, in light of the inherent risk that this information, together with other information, could be used to identify individuals, the data is also appropriately organised and

separated, with access granted only as necessary to those who require access (e.g. one person per pilot site). Combinations of demographic data that might lead to identification or personal information collected from small groups of individuals will be avoided unless necessary and otherwise encrypted or pseudonymised. Unless necessary, certain types of personal information will not be collected, e.g., (without limitation) age, gender, nationality, occupational and Socio-Economic Status (SES) and address. The types of data collected will be clearly communicated to individuals via a GDPR-compliant privacy policy. The collection of sensitive data will be avoided unless necessary and then only with the individual's explicit consent to the processing for a specified purpose. In cases of in-depth qualitative data collection (e.g. ethnographic observations, interviews) with increased complexity of data collection, the risks involved with such data will be considered on a case-by-case basis and in advance of any processing, by way of a privacy impact assessment. This will also be taken into serious consideration for ethics approval. Any databases including participants' details will only be held for as long as necessary and in the case of most personal data collected, this will be for no longer than the duration of the research project ((3) three years. Access to any such database will be limited and only granted when necessary. Personal data may be held for longer, where individuals confirm that they would like us to retain certain personal information of theirs (e.g. it is often the case that participants inform researchers that they would like to participate in other studies in the future). Where individuals' personal information is being shared with third parties, this will only be done where the relevant individuals have provided clear, affirmative, freely given, specific, informed and unambiguous consent to this, and only in accordance with all applicable laws.

In addition, aggregated data and/ or inferences-mainly related to consolidated estimations and not personalised data- will be shared with researchers outside the Consortium only upon agreement to do so, as the project participates in the Open Research Pilot.

3.2 Pilot Participant Recruitment Process for user testing

The SHOW pilot activities will involve users participating at different countries and regions within each country. All people that will be actively participating and/or being affected by the execution of each of the pilot, will take part in a thorough recruitment and informed consent procedure, that will be particularly stringent to ensure no coercion (not even soft or indirect) is exerted. The specific criteria for the selection of the volunteer participants will be determined by the pilot requirements, while there will be participants with various roles.

Furthermore, specific measures to protect the participants from a breach of privacy/confidentiality and potential discrimination will be applied with regards to confidentiality, right to get more information about the Pilots, and give informed consent.

Namely, reference to the following will be included in the recruitment strategies chapter of D9.2 and D9.3, respectively and, consequently, to the potential users during the recruitment process:

- Name and contact details of the organization recruiting participants (including contact details of appointed Data Protection Officer (DPO)). The list of DPO contact points per Pilot site can be found in D18.2;
- Reason for recruitment and data collected during recruitment (e.g. contact details);
- Statement on why data collected are used solely for recruitment purposes;

- Contact and recruitment criteria data statement of use;
- Recruitment sources;
- Statement on recruitment data are stored locally and are not shared outside EU;
- Recruitment data storage period (will not exceed project lifetime);
- Potential participants' rights to be forgotten, to withdraw before consent, to restrict process, to rectify and/or access their data and to be kept informed about their data;
- Information about how potential participants can act in order to access their personal data;
- Processes (i.e. the project's general privacy policy) the project will create in order to protect data (e.g. encryption, privacy by design).

3.3 Technical and organizational measures

It will additionally address the main **technical and organizational measures** to be applied in all activities related to user data and private data handling in the duration of the project. These measures will be taken to ensure data and private data are protected and that their processing is happening in accordance to GDPR principles. An overview of the technical and organizational measures -based on Art. 32 (1) GDPR- is presented below but they will be further elaborated when the mechanisms will be selected; thus, connecting this Deliverable and D4.3 'Data management plan' (updated in D9.7) as well as their subsequent updates.

Pseudonymisation and Encryption

- Encrypted data transfer through server (SSL).
- Pseudonymisation of personal data for both development, integration and testing on UC and project level.
- Protective measures against infiltration will be created and provided.
- Physical protection of core parts of systems and access control measures will be provided.
- Logging of systems and mechanisms as well as appropriate auditing of the peripheral components will be available.

Confidentiality

- Access to data is restricted and password protected.
- Access is documented and system controlled with permission and with potential for access removal.
- Anti-virus software protected with automated updates and firewalls usage of systems and solutions throughout the duration of the project and the duration of data storage after the end of the project (3 years before destroying data).
- Automatically activated and password-protected computer locking.
- Password-protected access to all data and to a limited number of partners.
- No access to personal data and no link to other data.
- Prevention of forced password entry attempts.
- Restriction to account access.
- Logging of all access attempts and those who are failed to data storage.
- Separated data handling.

Integrity

- Detailed tracking of accessing and interacting with data (e.g. uploads, changes, versions, access times, etc.).
- Frequent backups to ensure data are not corrupted.
- Ensuring utilised S/W, applications, systems involved are regularly updated and properly configured.

Availability and Resilience

- Deletion procedures are established and documented.
- The controller has a clearly defined process of data handling.

Restoring data access

- Documented and regularly tested failover procedures.

Evaluation of technical and organizational measures

- Regularly reviewing the project's data privacy policy.
- Ensuring partners are informed/trained on data privacy measures.
- Monitor partner regarding data privacy measures (through Data Privacy Impact Assessment procedure).

3.4 Data Protection Authorities & Officers

At project level, the Coordinator will act as the point of contact for Data Protection Issues and as the de facto DPO in the project. The responsibilities of the DPO will be in line with Article 39 of the GDPR and will include, at a minimum, the following:

- Advise data controllers and processors within the SHOW project on the processing of personal data, training of researchers and assignment of responsibilities.
- Provide support on the performance and tracking of Impact Assessments
- Assist in risk assessment of personal data processing.
- Cooperate with any national or European supervisory authority and act as contact point for the project with such authorities.

Data controllers and processors at each Pilot site

The applicant's team will dully follow the national guidelines set by the data protection authority in each country pilot site for Data Controllers. They must respect the provisions of national legislation and more specifically:

- They must collect personal data fairly and lawfully.
- They must process only the data which are necessary for one or more specified purposes.
- They must make sure that they keep data accurate and up to date.
- They must retain data only for as long as is deemed necessary for the purpose of the collection and process thereof.
- The Controller must implement appropriate organisational and technical measures to secure data and protect them against accidental or unlawful

destruction, accidental loss, alteration, unauthorised disclosure or access as well as any other form of unlawful processing.

- If the data processing is carried out on behalf of the Controller, by a person not dependent upon him, the relevant assignment must necessarily be in writing.
- The Controller must respect the data subject's rights to information, access and objection.
- In order to carry out the data processing, the Controller must choose employees with relevant professional qualifications providing enough guarantees in terms of technical expertise and personal integrity to ensure such confidentiality.
- They must meet their obligations vis-a-vis the DPA (notification, granting of permit).
- They must be kept informed on any Decisions, Directives or Recommendations issued by the DPA that may be important to them.

The data controller and data processor templates will be annexed in D14.2 'Data Management Plan'.

An application will be submitted, and testing will start only if application is approved. A confirmation letter will be issued and communicated to the applicant. Each demonstration site has appoint a separate regional/institutional DPO (see D18.2).

3.5 Data Protection Agency Notification

The data to be processed in SHOW will potentially constitute Personal Data within the meaning of the EU Directive and relevant national legislation. SHOW might be exempted from national notification processes because our data collection is for the purposes of scientific research and because thus also additional institutional data protection measures, access restrictions, etc. will be put in place. We are mindful nevertheless that anonymisation approaches must be applied to video/still images within data to avoid the risk that a token identifier might become associated with enough unique data points to uniquely identify a living individual. We also undertake to notify data protection authorities in jurisdictions where research activities will be carried out and specific relevant actions to obtain, if necessary, authorisation for such activities. The exact requirements and due diligence will need to be scoped and defined within the relevant jurisdictions.

The relevant national approvals will be sought and acquired as and when necessary as the notification requirements vary from one country to another and therefore no single timeline can be provided for completion of all notification procedures. Renewal of notifications, when necessary, will be carried out in-line with requirements of different national legislations. Processes for notification vary from one jurisdiction to another. The following project principals have been assigned the responsibility of acting as interlocutor with their own national data protection agency. Further information on notification procedures and the relevant agencies in Europe can be found in the Article 29 Working Group document "*Vademecum on Notification Requirements*".

The exact partner and contact person who will notify the relevant Data Protection Agency will be determined during the project and after the transition from Directive 95/46 to General Data Protection Regulation (GDPR) 2016/679.

Renewal of notifications, when necessary, will be carried out in-line with requirements of different national legislations. The renewal requirements will also be leveraged to

react to change in the project and the adoption of video archives into research, development and test tasks.

3.6 Compliance to specific parts of GDPR

Compliance with GDPR Recital 78 is sought. It is necessary for the data to be related to an identified or identifiable living individual. The individual need not be directly identifiable but may be identified by a reference number or some other tag which, in a given small group or through analysis of patterns in adequate volumes of data, might allow an individual to be singled out from a group. Based on the kinds of data sources to be included in this research, direct personal identifiers (e.g. specific names or faces) may exist in a variety of locations within the data set. SHOW's default anonymisation process(es) will be 'one-way,' with original source data being disposed of such that re-identification of data or decoding of anonymisation tokens by reference to any 'real-world' data sets will be rendered difficult to the greatest extent possible. SHOW will follow the guidance set forth in the Article 29 Working Group 05/2014 Opinion on Anonymisation Techniques and specifically its recommendations on Pseudo-anonymisation, Noise addition, Substitution, Aggregation, K-anonymity, L-diversity, Differential privacy and Hashing/Tokenization. SHOW will also include downstream contractual obligations as a legal measure to respecting privacy in the use of the projects results.

Compliance with Article 49 of the GDPR is again sought. While our position as scientific researchers permit us derogation from the prohibition on processing (sensitive categories of) Personal Data, we are nevertheless aware that it remains incumbent upon us, to provide specific and suitable safeguards to protect the fundamental rights and privacy of Data Subjects. Some of these safeguards are already detailed above. SHOW further undertakes to ensure that any Personal Data collected will also be treated in accordance with Article 49. Personal Data collected will be processed fairly and lawfully. Personal Data collected will be used only for research purposes as specified in our original proposal. The data will be adequate, relevant and not excessive in relation to the purposes for which they are collected. We will endeavour not to collect, and we will expunge all data that is not directly project related.

Safe Harbour and Privacy Shield Considerations. In light of the Court of Justice of the European Union October 6th 2015 decision on the EU-US Safe Harbour agreement, the Drive2theFutre project will store all data derived from personal data (after anonymization or dissociation) in EU member states and comply with the Article 29 Working Groups communiques on transfer of data outside of the union and forthcoming member state decisions on Safe Harbour.

Minimum Resort to Exceptions and Derogations. The GPDR allows for exceptions and derogations for personal data used for research. For example, general exemptions for processing of certain categories of sensitive personal data (e.g. Article 6 and Recital 50). Exceptions for a right to opposition for processing or storage of data (Article 89), and for processing of data without consent (Article 6.1.f, Recitals 47 and 157) may be applicable. SHOW commits to a minimum resort to exceptions and derogations in the processing of personal data within the project for the purposes of research.

3.7 Data Privacy Impact Assessment (DPIA)

The Privacy Impact Assessment is required under Article 35 of the General Data Protection Regulation (EU) 2016/679. A DPIA is a process which helps assessing privacy risks to individuals in the collection, use and disclosure of information. DPIAs help identifying privacy risks, foresee problems and bringing forward solutions.

An initial Data Privacy Impact Assessment template (Annex V) will be completed by relevant partners in order to investigate if personal data and/or sensitive data will be collected during the lifetime of the project and to identify any relevant risks. The process of the Data Privacy Impact Assessment (DPIA) will start in M8 to provide an overview of all the activities that will take place in the project and, as such, anticipate any potential issues. DPIA is an evolving process in the project. As such, continuous updates fed by respective developments in the project as well as the currently undergoing revisions for legal approval will emerge.

The focus on the DPIA at this point, will be to highlight the key areas private data might be collected/ processed. This first assessment will not be exhaustive and will be included in the next version of this Deliverable (D3.4). This template should be kept and updated by all partners involved in data collecting and processing.

4 Conclusions

In this deliverable the SHOW Ethics manual & Data Protection Policy is specified. This manual shows the aim, role and names of the Ethical board. It also provides the code for conduct of research integrity and finally it includes the Data Protection Policy for SHOW.

All this information is mandatory to follow when involving humans in the work with pre-pilots and Demonstration activities within SHOW.

Although, there are dedicated versions of this Deliverable; however, as addressing the Ethics, data privacy and protection is a process and, as such, they will be addressed. Therefore, any additions and changes will be included in relevant Deliverables (for example, if short consent forms or disclaimers will be required for events and dissemination activities, then such templates will be annexed in the respective Deliverable).

A template was prepared in order to collect the ethics requirements related to any activities involving gathering data from users/participants/respondents and it will be circulated to partners involved in data collection and/or processing during the lifetime of SHOW project. This form will be additionally shared with the WP leaders to further investigate which activities might require user involvement (e.g. WP1 surveys). The completed forms aim to capture the current Ethics profile of involved partners with reference to the following categories:

A) Participants and informed consent
B) Ethical control instruments
C) Privacy
D) Safety
E) Risk assessment
F) Reimbursement

As the project progresses and the evaluation plans are drafted, these forms will be re-visited and recirculated to partners to investigate if anything has changed in relation to Ethics guidelines/legislation at an organization/regional/national level.

The next version of this Deliverable (D3.4) will present the national Ethics profile of each pilot site with reference to national legislation and guidelines, apart from the ones listed in Annex V. based on the completed Ethics controlling questionnaire (Annex II). Moreover, ethical issues in vehicle automation will be addressed after the project Key Performance Indicators (KPIs) (WP13, WP9) and evaluation framework (WP9) are set and will be presented in the second version of this Deliverable. In addition, based on the technological developments, further automation focus ethical issues, risks and aspects will be addressed in D3.4. The Data Privacy Policy for the online tools, websites (incl. cookies), social media capturing tools and mechanisms, terms of use and supply will be prepared and will be available in D3.4.

The ethics approvals and final DPIA will be included in the final Ethics Manual (D3.5). The main data clusters and some of the evaluation material for the activities mentioned above will be available and any ethical treatments and data protection mechanisms will also be included in this version, on pilot and project level. Finally, a preliminary Data Privacy Impact Assessment (DPIA) will be conducted in collaboration with the data collectors and processors at each pilot site, the data manager, the project DPO (and local DPO), as identified in D18.2 andthe Data Management Plan (DMP) (D14.2; ERTICO).

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Annex I SHOW Ethics checklist

Names of the investigator responsible for this project: (Name, email address)

1. Who is conducting the Pilot?

2. Title of the study

3. What is the purpose of this research study?

4. Who can take part in this study?

5. Why should a person consider joining this study?

6. If a person joined the study, can he/she change his/her my mind and drop out before it ends?

7. What exactly will be done to with a person, and what kinds of treatments or procedures will he/she receive?

8. What kinds of harm can a person experience in this study, and what will the investigators do

to reduce the risk of harm?

9. What will the investigators do to make sure that the information collected on persons will not get in wrong hands?

10. What kinds of benefits can person expect from taking part in this study?

11. What kinds of benefit to others can come out of this study?

12. Will the persons get paid for taking part in this study?

13. Will the person or the persons health insurance company be charged for any of the costs of this study?

14. What can a person do if he/she wants to find out more about the study, or to complain about the way he/she is treated?

15. Will personal information be shared with any other partner of third party?

16. What will happen to any information given by a person and how will it be stored?

17. How long will personal information be stored?

18. Will the data possibly be commercially exploited?

19. Will any Photographs/Video be saved?

20. What are the persons rights?

21. Is SHOW Data Protection Policy regarded?

	Please circle as necessary	
Is there a need for ethical approval?	Yes	No
If yes, has it been approved?	Yes	No
If yes, has it been uploaded to the Collaboration tool WP3/A3.1	Yes	No
Is the proposed research adequately designed, so that it will be of informational value?	Yes	No
Does the research pose risks of physical or psychological harm to participants by using deception, obtaining sensitive information or exposing them for risks in terms of safety and/or security hazards?	Yes	No
If risks exist, does the research adequately control these risks by including procedures, such as debriefing, removing or reducing risks of physical harm, or obtaining data anonymously? If that is not possible, will the research procedures guarantee that information will remain confidential?	Yes	No
Will participants receive adequate feedback at the completion of the study, including a debriefing if that is necessary?	Yes	No
Have I as part of the project informed the Ethics Board about the ethical issues I have identified and of which I am aware?	Yes	No

Annex II: Questionnaire on ethical and legal issues

This questionnaire on ethical and legal issues will be filled in by the investigator responsible for conducting trials involving human participants. It is a checklist reminding the researcher to consider all relevant ethical aspects before planning and then conducting any data collection activities within SHOW. The questionnaire is divided into five subsections: Informed consent, Ethical control instruments, Privacy, Safety and Risk assessment.

Questionnaire on Ethical and Legal issues

Should all testing related activities be approved by a local research ethics committee?

❑Yes ❑ No

A) Participants and informed consent

1. **Do you intend to conduct pilots with individuals who might not understand the informed consent form?**

   ❑Yes ❑ No

   If ***yes***, briefly explain the procedures you follow in order to obtain informed consent: _____

   If ***no***, please continue with the next question.

2. **Is there any doubt about the individual's cognitive capacity to consent?**

   ❑Yes ❑ No

   If ***Yes***, please clarify who will provide consent in such instance: _____

   If ***no*** please continue with the next question.

3. **a) Is the informed consent provided in common language to be understood by "the man/woman in the street"?**

   ❑Yes ❑ No

   If ***no***, why not? Please provide an example of any *termini technici* used within the description.

   b) Will the participant be given sufficient time to reflect his/her decision of giving or withholding consent?

   ❑Yes ❑ No

   If ***no***, why not? Please indicate the time given to the participant.

4. **Is the participant unable to consent for any reason not specifically listed in questions 1 to 3?**

   ❑Yes ❑ No

   If ***yes***, **no experiment will be performed since these participants are excluded from SHOW trials.**

   If ***no***, please continue with the next question.

5. **Does the participant included in research object in either words or body language or any physical action that can be interpreted to that end?**

   ❑Yes ❑ No

   If ***no*** (no objection) please continue with the next question.

   If *yes* (he/she does object) no experiment will be performed since these participants are excluded from SHOW trials.

6. **Is the participant for any reason unable to read the form by him-/herself?**

   ❑Yes ❑ No

   If ***yes***, please continue with b)

   If ***no***, please continue with the next question.

   b) There are a range of people who are unable to read the consent form; these include those who have severe visual impairments (e.g. cataract, glaucoma).

7. **Is the participant illiterate?**

   ❑Yes ❑ No

   If ***no***, please continue with the question 10.

   If ***yes***, be advised that an illiterate participant has to give oral consent which has to be witnessed at least by one person. If that is the case, please name the witness:

   Additionally, please answer the following question.

8. **Is the oral consent of an illiterate participant that is witnessed in accordance with your national legislation?**

   ❑Yes ❑ No

9. **Is there an international or national legislation, which you must follow when performing tests within SHOW project**

   a) involving healthy human participants?

   ❑Yes ❑ No

   If ***Yes***, please give details (reference number and short description of procedure):

b) involving participants with cognitive impairments / learning difficulties?

❑Yes ❑ No

If ***Yes***, please give details (reference number and short description of procedure):

c) involving *illiterate* or *with co-morbid conditions* participants?

❑Yes ❑ No

If ***Yes***, please give details (reference number and short description of procedure):

B) <u>Ethical control instruments</u>

10. At which level of your organization / enterprise, *ethical controls* are audited?

❑ laboratory or workgroup

❑ division or department

❑ institution

❑ regional

❑ national

11. Is there an ethics controlling body in your <u>region / country</u>?

❑Yes ❑ No

If ***Yes***, please give details about the body relevant for you and the procedure that has to be adhered to in order to obtain ethical approval of experiments:

12. Is there a <u>local</u> ethics controlling committee, that your organisation is obliged to get approval from, for the experimental procedures before beginning with the experiment?

❑Yes ❑ No

If ***Yes***, please give details of the relevant body and shortly describe the specific procedure:

13. Is there an established ethical control procedure which you must follow before performing tests with:

a) healthy human participants?

❑Yes ❑ No

If ***Yes***, please give a brief description.

b) human participants with cognitive impairments / learning difficulties?

❑Yes ❑ No

If ***Yes***, please give a brief description.

c) *illiterate* or *with co-morbid conditions* participants?

❑Yes ❑ No

If ***Yes***, please give a brief description.

C) Privacy

14. Is private information recorded?

❑Yes ❑ No

15. Is there an established Data Protection Authority issuing procedures / standards you must follow before performing tests with human participants and their personal / private data?

❑Yes ❑ No

If ***Yes***, please give a brief outline of it:

If ***No***, please explain briefly what corrective actions you will take to ensure privacy of personal data of participants:

16. Do you follow written procedures for protecting privacy?

❑Yes ❑ No

If ***Yes***, please give a brief outline of it:

If ***No***, please explain the reasons briefly and state any corrective actions you will take:

17. Do you follow or are you aware of any official national or international guidelines on protecting privacy?

❑Yes ❑ No

If ***Yes***, please give a brief outline and provide references:

18. Do you clarify to the participants that all data collected in the activities they are participating in will be kept entirely confidential and that their anonymity will be protected in full?

❑Yes ❑ No

If ***Yes***, please give a brief outline and provide references:

19. Do you identify persons and their professions who are authorised to have access to the data collected and / or who have access to any data storage devices, both, paper-based and electronically?

❑Yes ❑ No

If ***Yes***, please give a brief outline and provide references.

D) <u>Safety</u>

20. Will you provide information to the participants if you become aware of an illness?

❑Yes ❑ No

If ***Yes***, please give a brief outline of it and provide some references:

21. Is every experiment evaluated for any side-effects?

❑Yes ❑ No

If ***Yes***, please give a brief outline of it:

22. Do have written procedures for safety for employees and volunteers within your own group or institution?

❑Yes ❑ No

If ***Yes***, please give a brief outline of it:

If ***No***, please explain the reasons briefly or what corrective actions you take:

E) <u>Risk assessment</u>

23. Do you have procedures to perform risk-assessment concerning breach of privacy and / or breach of safety?

□Yes □ No

If ***Yes***, please give a brief outline of it:

If ***No***, please explain the reasons briefly refer to any corrective actions you will take:

24. Is your organisation insured against risks as a result of breach of privacy and safety?

□Yes □ No

If ***Yes***, please give a brief outline of it and state the insurer, if possible:

If ***No***, please explain the reasons briefly and state who would cover any insurance-related costs:

25. For conducting research and manage the risk, do you need to involve other organisations (unit, division, department, etc.) that might influence your research activities and/or your ethical and legal conduct?

□Yes □ No

If Yes, please give a brief outline of it:

Annex III: Project calendar for interviews, surveys, focus groups & workshops

A. Calendar for interviews and surveys

Table 4: Calendar for interviews and surveys

Activity	Description	When to be addressed	Target audience	Relevant deliverable and Month
1st year (M1-M12)				
A2.1: Benchmarking of existing business / operating models and best practices	**Dedicated interviews** for expanding and enriching the benchmarking activity. Aim is to focus on thoroughly understanding the innovation factors for success and failure of current examples of CCAV solutions, especially from a user-centric perspective, but also taking into account technical and organizational aspects (e.g. deployment environment).	Months 1-7	At least 100 relevant external stakeholders, also involving AB.	D2.1: Benchmarking of existing business /operating models & best practices, Month 9
A3.3: Regulatory and operational aspects	**Online survey**, which will be developed in coordination with WP17 partners (UITP, IESTA and the City of Bremen) and **complemented by targeted interviews** organised in the framework of EUROCITIES Mobility Forum and Knowledge Society Forum Meetings and other relevant events.	Months 1 -12	Public and regional authorities, linked to the SHOW demo sites, but also engaging local and regional (transport) authorities beyond the project consortium.	D3.1: Analysis report on legal, regulatory, institutional frameworks, M12
2nd year (M13-M24)				

Activity	Description	When to be addressed	Target audience	Relevant deliverable and Month
A1.1: Ecosystem perceived and real needs in conjunction with **A13.5: User experience, awareness and acceptance impact assessment**	**On-line surveys** that will be realised in each SHOW Mega and Satellite site during the Pilots focusing on user acceptance, user experience and awareness.	Twice; Once before and once during the pre-demo (M14-M24) activities.	Around **330 stakeholders per Mega Site** and **100 ones per Satellite site** (covering all stakeholders and travellers cohorts) - "Observers"	• D1.3: Stakeholder & travellers' needs evolution through Pilots, M42 • D13.5: SHOW impact assessment on user experience, awareness and acceptance, M44
3rd year (M25-M36)				
A1.1: Ecosystem perceived and real needs in conjunction with **A13.5: User experience, awareness and acceptance impact assessment**	**On-line surveys** that will be realised in each SHOW Mega and Satellite site during the Pilots focusing on user acceptance, user experience and awareness.	In the mid-term of final demo (M24-M36) activities.	Around **330 stakeholders per Mega Site** and **100 ones per Satellite site** (covering all stakeholders and travellers cohorts) – actual participants.	• D1.3: Stakeholder & travellers' needs evolution through Pilots, M42 • D13.5: SHOW impact assessment on user experience, awareness and acceptance, M44
4th year (M37-M48)				
A1.1: Ecosystem perceived and real needs in conjunction with **A13.5: User experience, awareness and acceptance impact assessment**	**On-line surveys** that will be realised in each SHOW Mega and Satellite site during the Pilots focusing on user acceptance, user experience and awareness.	At the end of final demo activities.	Around **330 stakeholders per Mega Site** and **100 ones per Satellite site** (covering all stakeholders and travellers cohorts) – actual participants.	• D1.3: Stakeholder & travellers' needs evolution through Pilots, M42 • D13.5: SHOW impact assessment on user experience, awareness and acceptance, M44
A13.3: Societal, employability and equity issues assessment	**Dedicated interviews** aiming to link with other project and initiatives outside Europe (through the training activities of WP16), as well as the	M30-M44	At least 30 external stakeholders and	D13.3: SHOW impact assessment on society, M44

Activity	Description	When to be addressed	Target audience	Relevant deliverable and Month
	concertation mechanism of WP14.		international experts.	
A13.6: Overall impact assessment and cross pilot comparisons	**Tailored surveys** with pre-selected user profiles.	Months 30-44	All types of (future) users of shared CCAV.	D13.6: Overall impact assessment and cross pilot comparisons, M46

B. Calendar for workshops and focus groups

Table 5: Calendar for workshops and focus groups

Activity	Description	When to be addressed	Target Audience	Relevant deliverable and month
1st year (M1-M12)				
A1.1: Ecosystem perceived and real needs (CERTH) (also in context of A15.2)	**UCs prioritisation and optimization workshop**.	Month 8 in Thessaloniki	At least 30 external experts, covering all key types of stakeholders.	D1.2: SHOW Use Cases, M9
A2.1: Benchmarking of existing business / operating models and best practices	**One dedicated workshop in each Mega/Satellite site** (involving the local ecosystem), to foster a multi-stakeholder debate and generate a deeper understanding about the implications of each business model to all stakeholders.	M1-M9	All types of stakeholders; local ecosystem of Mega and Satellite sites.	D2.1: Benchmarking of existing business / operating models & best practices, M9
A3.3: Regulatory and operational aspects	**Focus group meetings** that will be organised in the framework of EUROCITIES Mobility Forum and Knowledge Society Forum Meetings and other relevant events to complement	M1 - M12	Public and regional authorities, linked to the SHOW demo sites, but also engaging local and regional (transport)	Focus group activities reported in **D3.1**: Analysis report on legal, regulatory, institutional frameworks, M12.

Activity	Description	When to be addressed	Target Audience	Relevant deliverable and month
	the on-line survey and interviews.		authorities beyond the project consortium.	
2nd year (M13-M24)				
A3.3: Regulatory and operational aspects	**2 taskforce meetings** organised in the framework of EUROCITIES Mobility Forum and Knowledge Society Forum Meetings.	M12 – M24	Public and regional authorities, linked to the SHOW demo sites, but also engaging local and regional (transport) authorities beyond the project consortium.	Recommendations on the basis of surveys, focus groups and taskforce meetings in **D3.3**: Recommendations for Adapting Regulatory and Operational Strategies for CCAV deployment at Local and Regional Level, M30
3rd year (M25-M36)				
A15.2: Stakeholders forum, major events and demo events organisation	At least 5 local demo Events.	During 3rd year of the project.	All types of stakeholders in project sites.	D15.6: SHOW dissemination and communication activities, M48
4th year (M37-M48)				
A13.6: Overall impact assessment and cross pilot comparisons	**Physical Open Innovation workshops**, including dedicated working sessions.	Last year of the project.	Potential future users of shared CCAV.	D13.5: Overall impact assessment and cross pilot comparisons, M46
A15.2: Stakeholders forum, major events and demo events organisation	**Local demo events** **in at least** **80% of the sites**.	During 4th year of the project.	All types of stakeholders in project sites.	D15.6: SHOW dissemination and communication activities, M48
A15.2: Stakeholders	**Closing pan-European**	4th year of the project	All types of stakeholders – at	D15.6: SHOW dissemination and

Activity	Description	When to be addressed	Target Audience	Relevant deliverable and month
forum, major events and demo events organisation	**workshop of SHOW and live demo** (in a selected pilot site).		least 50 external participants.	communication activities, M48
Whole (or more than 1 year) project duration				
A9.3: Users engagement and co-creation initiatives	**3 Hackathon events for developers,** where designers, developers and scientists of diverse backgrounds will work closely with business analysts and user representatives (transport services operators, travellers, etc.) to develop the relevant services **AND 3 Ideathons for citizen** **Engagement** organised on ideas stemming from citizens and local stakeholders, as brainstorming processes to get solution oriented ideas, recognize gaps or SHOW solutions limitations.	• **M1-M12:** 1 Ideathon • **M12-M24:** 1 Hacathon & 1 Ideathon • **M25 – M36:** 1 Hacathon & 1 Ideathon • **M37 – M48:** 1 Hacathon	• **Hacathons:** Developers from the project, as well as externals from each Pilot site and beyond. • **Ideathons**: Citizens & local stakeholders.	D9.4 : Users engagement and co-creation initiatives, M42
A16.3: Exploitation plans per partner and stakeholder group	Generic business exploitation models and strategies per cluster and roadmaps for large-scale deployment **through stakeholder workshops with podium discussions** and **break out focus groups/ interviews** will be developed.	M13-M48	Involving **all mobility stakeholders** (local authorities, mobility providers established and newcomers) as well as **mobility users**. Will engage with **each of the pilot sites** in SHOW to provide personalised assessment.	+ Additional preliminary version requested by the EC for M18. D16.2: First version of business and exploitation plans, M30 D16.3: Final business and economic assessment and

Activity	Description	When to be addressed	Target Audience	Relevant deliverable and month
				exploitation plans, M48
A17.2: Automation and SUMP assessment, scenarios and DSS	**A minimum of 8 interactive workshops back to back with SHOW events**, **EUROCITIES Mobility Forum Meetings and other relevant conferences at EU level** offering a mix of best practices and applied methodologies, peer-to-peer exchange, scenario development and testing of decision support tools.	M25-M48	Stakeholder representatives, policy makers.	D17.1: First issue of best practices and decision making mechanisms for different stakeholder groups, M35 D17.3: Cities and Authorities decision making mechanisms, M46

Table 6: Overview of activities per year

SHOW YEAR	Activities							Coupling opportunities
	A	B	C	D	E	F	G	
1st year (M1-M12)	Interviews to external stakeholders, business issues, A2.1, Months 1-7	Online survey and targeted interviews on regulatory and operational aspects with public and regional authorities, linked to the SHOW demo sites, A3.3, Months 1 -12	1st project Pan-European workshop on UCs prioritisation and optimization with all key types of stakeholders, Thessaloniki, M8	One dedicated workshop in each Mega/Satellite site on business issues, with all types of stakeholders involving the local ecosystem, M1-M9	Focus group meetings on regulatory and operational aspects with public and regional authorities, linked to the SHOW demo sites to complement survey and interviews, A3.3, M1 - M12	1 Ideathon for citizen Engagement with citizens & local stakeholders, A9.3, 1st year of the project.		- Combination of E focus groups & B interviews - Combination of C workshop and part of D workshops - Combination of Ideathon with 1st Pan-European workshop?
2nd year (M13-M24)	User acceptance on-line	2 taskforce meetings with public and	1 Ideathon for citizen	1 Hackathon for developers				- Combination of C Ideathon & D Hackathon in

SHOW YEAR	Activities							Coupling opportunities
	A	B	C	D	E	F	G	
	surveys with stakeholders and travelers in Mega and Satellite site, A1.1 & A13.5, once before and once during the pre-demo (M14-M24) activities	regional authorities, linked to the SHOW demo sites organised in the framework of EUROCITIES Mobility Forum and Knowledge Society Forum Meetings on regulatory and operational aspects, A3.3, M12 – M24	Engagement with citizens & local stakeholders, A9.3, 2nd year of the project.	from the project, as well as externals from each Pilot site and beyond, A9.3, 2nd year of the project.				the same site (though not the optimal solution necessarily)
3rd year (M25-M36)	User acceptance on-line surveys with stakeholders and	At least 5 local demo Events in project sites with all types of	1 Ideathon for citizen Engagement with citizens & local	1 Hackathon for developers from the project, as well as externals				- Combination of C Ideathon & D Hackathon in the same site (though not the optimal

SHOW YEAR	Activities							Coupling opportunities
	A	B	C	D	E	F	G	
	travelers in Mega and Satellite site, A1.1 & A13.5, in the mid-term of final demo (M24-M36) activities.	stakeholders, A15.2, 3rd year of the project.	stakeholders, A9.3, 3rd year of the project.	from each Pilot site and beyond, A9.3, 3rd year of the project.				- solution necessarily) - Combination of the above with the local events of B (in one or two sites depending in the Ideathon and Hacathon will be held in one or two different sites)
4th year (M37-M48)	User acceptance on-line surveys with stakeholders and travelers in Mega and Satellite site, A1.1 & A13.5, at the	Dedicated interviews with external stakeholders and international experts on societal, employability and equity	Tailored surveys with pre-selected user profiles with all types of (future) users of shared CCAV for overall	Physical Open Innovation workshops, including dedicated working sessions on overall impact assessment with	Local demo events in at least 80% of the sites with all types of stakeholders, A15.2, during 4th	Closing pan-European workshop of SHOW and live demo with all types of stakeholders and travellers,	1 Hackathon for developers from the project, as well as externals from each Pilot site and beyond,	- C surveys and final A user acceptance surveys could be combined. - D open innovation workshops, E local demo events, D Hacathon and F closing Pan-European

SHOW YEAR	Activities							Coupling opportunities
	A	B	C	D	E	F	G	
	end of final demo activities.	issues, A13.3, M30-M44	impact assessment, A13.6, Months 30-44	potential future users of shared CCAV, A13.6, 4th year of the project.	year of the project.	during 4th year of the project.	A9.3, 4th year of the project.	workshop could and should be combined in the final "demoweek" of SHOW.
Whole (or more than 1 year) project duration	Mobility stakeholder workshops with podium discussions and break out focus groups/ interviews on exploitation issues, A16.3, M13-M48	8 interactive workshops back to back with SHOW events, EUROCITIES Mobility Forum Meetings and other relevant conferences at EU level with stakeholder representatives, policy makers, A17.2, M25-M48						- A and B workshops could be combined. Some of them could be combined with local demo events and the closing Pan-European workshop of 3rd and 4th year.

Annex IV: Data Privacy Impact Assessment (DPIA template)

Do I have to do a DPIA?

Determining if you need to do a DPIA - screening questions

Answering yes to **any** of these questions indicates that a PIA is necessary.

- Will the project involve the collection of new information about individuals?
- Will the project compel individuals to provide information about themselves?
- Will information about individuals be disclosed to organisations or people who have not previously had routine access to the information?
- Are you using information about individuals for a purpose it is not currently used for, or in a way it is not currently used?
- Does the project involve you using new technology which might be perceived as being privacy intrusive? For example, the use of biometrics or facial recognition.
- Will the project result in you making decisions or taking action against individuals in ways which can have a significant impact on them?
- Is the information about individuals of a kind particularly likely to raise privacy concerns or expectations? For example, health records, criminal records or other information that people would consider to be particularly private.
- Will the project require you to contact individuals in ways which they may find intrusive?

Step 1: Identify the need for a DPIA

Explain broadly what aims to achieve and what type of processing it involves. You may find it helpful to refer or link to other documents, such as relevant deliverables and other supportive documents that reside in SharePoint. Summarize why you identified the need for a DPIA.

Step 2: Describe the processing

Describe the nature of the processing

Describe the scope of the processing

Describe the context of the processing

Describe the purposes of the processing

Step 3: Consultation process

Consider how to consult with relevant stakeholders

Step 4: Assess necessity and proportionality

Describe compliance and proportionality measures, in particular

Step 5: Identify and assess risks

Describe source of risk and nature of potential impact on individuals. Include associated compliance and corporate risks as necessary.	Likelihood of harm	Severity of harm	Overall risk

Step 6: Identify measures to reduce risk

Identify additional measures you could take to reduce or eliminate risks identified as medium or high risk in step 5				
Risk	**Options to reduce or eliminate risk**	**Effect on risk** [eliminated; reduced; accepted]	**Residual risk** [low; medium; high]	**Measure approved** [Yes/No]

Step 7: Sign off and record outcomes

1. **Who has approved the privacy risks involved in the project? What solutions need to be implemented?**

Risk	Approved solution	Approved by
E.g. Risk 1	*Data will be deleted when it is no longer necessary to retain such data.*	*E.g. Data Protection Officer. Note, if there is no DPO or National Agency responsible for that, the data manager (CERTH) will be responsible for looking into the privacy risks (with support from the Managing team and proposing the mitigation solution.*

2. **Integrate the PIA outcomes back into the project plan. Who is responsible for integrating the PIA outcomes back into the project plan and updating any project management paperwork? Who is responsible for implementing the solutions that have been approved? Who is the contact for any privacy concerns which may arise in the future?**

Action to be taken	***Date for completion of actions***	***Responsibility for action***
Data to be deleted.	*Insert date/description of when.*	*E.g. Data Protection Officer.*

Annex V: Relevant Laws & Directives

Specific Laws and Directives to be considered per area are summarised in the Table below. In addition, the key changes for reforming EU data protection legislation are also considered with emphasis on the participant's **"right-to-be-forgotten**".

Table 7: Legislation and non-binding instruments to be considered by SHOW's Ethics Board

Ethical & social issue	Ethics area	Law/directive
Human Dignity and integrity of user	Human rights	• Universal Declaration of Human Rights (United Nations) • Convention for the Protection of Human Rights and Fundamental Freedoms (Council of Europe) • European Charter of Fundamental Rights • Draft recommendation of the Council of Europe on the promotion of the human rights of older persons • European Charter of the Rights of Older People in need of Long-term care and assistance
Privacy	Data protection	• The Regulation (EU) 2016/679 (General Data Protection Regulation - GDPR) (replacing the Directive 95/46/EC of the European parliament and the Council (1995)), on the protection of individuals about the processing of personal data and on the free movement of such data. • Directive 2006/24/EC of the European Parliament and of the Council of 15 March 2006 on the retention of data generated or processed in connection with the provision of publicly available electronic communications services or of public communications networks and amending Directive 2002/58/EC. • Directive 2002/58/EC of the European Parliament and of the Council, concerning the processing of personal data and the protection of privacy in the electronic communications sector. Take into account developments of Reform of the legislative framework for personal data protection (In January 2012, the European Commission proposed a reform of the Directive 95/46/CE, which constituted until now the basic instrument for personal data protection, in the form of a global Regulation on data protection 2012/001 (COD), supplemented by Directive 2012/0010 (COD) concerning the processing of personal in the area of police and judicial cooperation in criminal matters. • Art.29 Data Protection Working party: Working Document on Privacy on the Internet.

Ethical & social issue	Ethics area	Law/directive
New Technologies	Liability and Safety	• Directive 85/374/EEC on liability for defective products as amended by Directive 1999/34/EC, hereinafter "the defective products Directive" • Directive 2011/24/EU on the application of patients' rights in cross-border healthcare • Directive 90/385/EEC on active implantable medical devices and Directive 93/42/EEC on medical devices and Directive 98/79/EC on in vitro diagnostic medical devices • RoHS Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. • Directive 98/34/EC of the European Parliament and of the Council of 20 July 1998 amended by Directive 98/34/EC laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on information society services.
Safety and Certification of Autonomous systems/ vehicles		• Existing technologies adhere to all current and relevant standards in the area (of Application Requirements and Services, ISO TC 204 - Intelligent transport systems CEN TC 278 - Intelligent transport systems, etc.). • All the technologies are already verified validated before actual implementation for the pilot activities.