Fleet and traffic management systems
for conducting future cooperative mobility

D7.4 - Quality, Safety, Risk, and Ethics Monitoring

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1 INTRODUCTION

1.1 Project information

The project entitled **Fleet and Traffic Management Systems for Conducting Future Cooperative Mobility (CONDUCTOR)** aims to design, integrate, and demonstrate advanced, high-level traffic and fleet management that will allow efficient and globally optimal transport of passengers and goods while ensuring seamless multimodality and interoperability. Using innovative dynamic balancing and priority-based management of vehicles (automated and conventional) CONDUCTOR will build upon state-of-the-art fleet and traffic management solutions in the Cooperative, Connected and Automated Mobility (CCAM) ecosystem and develop next-generation simulation models and tools enabled by machine learning and data fusion, enhancing the capabilities of transport authorities and operators, allowing them to become "conductors" of future mobility networks.

The project will focus on upgrading existing tools based on driver-centred approaches towards a mobility-user-oriented approach, and ensure that the objectives are realistically achievable, as they will be grounded on tight collaboration with relevant stakeholders at the operator/city/authority level, where user needs are identified and validated. Therefore, the CONDUCTOR project is structured around the following objectives:

- Demonstrate traffic and fleet management to integrate CCAM for people and goods.
- Address intermodal interfaces and interoperability between traffic management systems.
- Test and demonstrate advanced simulation models in real-life traffic conditions considering different priorities.
- Demonstrate optimized mobility network load balancing.
- Consider governance of the traffic management system considering user needs.

The results of the models' integration will be validated through three use cases, each covering some of the main call requirements of interoperability of traffic management systems and integration of different transportation means while considering people and goods:

- UC1 Integrated traffic management with inter-modality: demonstrated in three cities – Athens, Spain, and Almelo.
- UC2 Demand-response transport: demonstrated in Slovenia.
- UC3 Urban logistics: demonstrated in Spain.

1.2 Document Scope

A risk assessment is planned to be performed on all CONDUCTOR layers using an extended Failure Mode and Effects Analysis (FMEA) methodology, related to T7.3 and in line with D7.1 [1]. For every risk identified, the risk **severity, occurrence probability, detectability and recoverability** will be ranked **by the CONDUCTOR partners and Use Case leaders** to allow the calculation of the overall risk level per each. The starting point will be the risks identified in the project's proposal phase. Not only **technical** but also **behavioural**, **legal/regulatory,** and **operational** risks will be considered, whereas apart from the **horizontal risks, risks associated with specific Use cases** will be also recognised if applicable.

The risk assessment process will take place in **2 iterations (M18 and M27)** throughout the 36 months of the project's duration. This close coordination and monitoring is needed to ensure that the consortium can work together as planned, to early identify risks and potential deviations from the project plan to anticipate and identify promptly corrective and mitigation actions. Progress and quality can subsequently be maintained by taking suitable corrective actions to best recover.

The final goal is to ensure the overall objective of the project: to design, integrate and demonstrate advanced, high-level traffic and fleet management that will allow efficient and globally optimal transport of passengers and goods while ensuring seamless multimodality and interoperability.

The goal of this deliverable is to show the results of the first risk assessment at **M18.** The main activities developed in this deliverable are:

- Monitoring and coordinating the consistency between WPs/Tasks
- Managing the flow of information and data between WPs
- Identifying and managing (potential) risks by preparing of Risk and Quality plan.
- All ethical and gender issues and safety and project data security measures reports.

1.3 Document Structure

The structure of this deliverable is the following:

- **Section 1** provides a brief introduction to the project.
- **Section 2** Quality control of the project
- **Section 3** Ethics policy and monitoring
- **Section 4** Risk assessment

2 QUALITY CONTROL IN THE PROJECT

As mentioned in D7.1 [1], this project has implemented quality procedures and quality assurance of deliverables. Furthermore, the project has also established the **quality baseline** which consists of project quality indicators. These indicators assist in monitoring and measuring the progress of the project at both the technical and management levels. The monitoring of those indicators concerning established baseline values allows the Project Coordinator (PC - INTRA), the Technical Manager (TM-JSI), the Risk, Quality and Ethics Manager (RQEM - BAX) and the consortium bodies to assess whether the goals of the project have been achieved. The chosen success criteria are quantifiable and critical to the success of the project. The indicators and the assigned values are reviewed, updated, and refined during the project through the scope and change management processes. CONDUCTOR has established specific measurable indicators for the verification of the achievement of the objectives as well as target values to be used for verification for all the CONDUCTOR-specific impacts (see **Table 1** – found in GA Section 2.3 of Part B).

The project will be measured against its performance indicators at several stages: the two project reviews and additional internal reviews. The results of performance measurement and evaluation (indicators and their values) will be part of the progress reporting to the EC.

Table 1. CONDUCTOR-specific impacts

SPECIFIC NEEDS	EXPECTED RESULTS	D/E/C MEASURES
• Europe's increasing level of urbanization, expected to increase from today's 74% to about 83.7% in 2050. • As a result, that creates multiple negative impacts in the European society, including increasing pressure on existing traffic infrastructure, accelerating air pollution and traffic jams. • Time losses from traffic congestion have a negative economic impact. • Finally, new mobility providers are causing damage, traffic increase and accident due to unregulated landscape.	• Development and validation of novel tools and models applied in three use cases, considering people and goods transports, tested in multiple EU locations (Madrid, Athens, Almelo, Slovenia/Italy). • Decreased time delays at traffic lights (10-20%), door-to-door travel times (10- 25%) and waiting transit times between AVs and fixed route traffic for people (5- 15%). • 10-15% improvement in quality of solutions compared to baseline KPIs (current transport service delivered) • Traffic queue length reduction (10-20%), increase of average space mean speed, spatio-temporal variation of traffic intensity, reduction of empty-km travelled by vehicles (10-25%) • Acceptance of governance models by 70% of stakeholders engaged in CONDUCTOR	• Dissemination: Journals and events pre-identified for publication of project results. Website, newsletters, and social media activity. Clustering with other funded projects. • Exploitation: feasible business models & cases and IPR plans for dedicated route-to-market strategies. • Communication: dedicated training for transport stakeholders and user associations, to raise awareness & adoption of novel tools; dedicated white papers coproduced with reference networks to address the EC; engagement with key transport stakeholders.
TARGET GROUPS	**OUTCOMES**	**IMPACTS**

• Municipalities and regional governments as policymakers • Small local businesses • Transport value chain: Public Transport operators and authorities • Industry: Software companies • Industry: infrastructure companies • Research community (RTOs, universities)	• Vehicle scheduling model for CCAVs • Social Routing Model • Route recommender considering transport network load balancing • Nudge engine for demand side management • Mobility data space for traffic data management, compliant with GAIA-X • Methodology for estimation and characterization of travel demand of people and goods • Data driven shared mobility demand forecast model • Holistic management evaluation strategies	• Societal & Environmental: Increased quality and livability in EU urban and metropolitan areas due to reduction of traffic congestion, leading to decrease of air and noise pollution • Scientific: access to new methodologies and decisionsupport tools for better transport planning and management. Advances beyond SotA in multiple domains. • Economic: optimization of mobility network load balancing of routes and increased reliability of arrival times of goods delivery or shared mobility services. Interoperability between transport management systems

2.1 Deliverables Management

All project results are materialized through a total of 30 Deliverables that must be submitted to the European Commission (EC) during the CONDUCTOR lifespan. To ensure optimal, smooth, and timely delivery of every Deliverable, as well as homogeneous presentation, this section defines the structure, the layout of project report Deliverables as well as the procedure to be used for their development. The list of Deliverables to be generated in this project is available in part A of GA (p.23), whilst they are also repeated in **Appendix I** of the current document.

2.1.1 Deliverable type and confidentiality levels

The Deliverables are classified according to the following types.

Table 2. Deliverable type references.

Reference	Meaning	Description
R	Report	Document, report (excluding the periodic and final reports)
DEM	Demonstrator	Demonstrator, pilot, prototype
DMP	Data Management Plan	/
DEC	N.A.	Websites, patents filing, press & media actions, videos, etc.
ETHICS	Ethics	Ethics requirement
ORDP	Open Research Data Pilot	Data to be provided to the Open Research Data Pilot
OTHER	N.A.	Software, technical diagram, etc.

The following document confidentiality categories are defined for CONDUCTOR project.

Table 3. Deliverable Confidentiality Level References.

Reference	Confidentiality	Description
PU	Public	Public Usage. No restrictions on access (in PDF format).
SEN	Sensitive	Limited under the conditions of the Grant Agreement [2]
CO	Confidential	Confidential, only for members of the consortium (including the Commission Services)

2.1.2 File naming convention

The Deliverable file naming follows the convention below.

"CONDUCTOR_D.No_short name_VERSION_STATUS.extension"

Table 4. Deliverable file naming convention.

Element	Naming convention	Case
CONDUCTOR	Standard initiating element	Upper
Document ID	• "D" for deliverable, together with its ID number (e.g. D14.1), as defined in the G.A. • "Periodic report" for interim reports to the European Commission. • "Final report" for the final report to the European Commission. • ""ID & Type of meeting" Agenda" for meeting agendas. • ""ID & Type of meeting" Agenda" for meeting minutes. • "Task_IR" for the internal reports. • "PR" for the peer review report of Deliverable.	Upper
Short name	Short name of the deliverable/meeting/report	Lower
VERSION	The document major and minor version numbers	Upper/ Lower
STATUS	One of {DRAFT, FINAL, SUBMITTED[1], APPROVED[2]}	Upper
Extension	The filename extension	Lower

The objective of the naming convention is to simplify and to make the identification of a document produced by the project self-explanatory. All project report documentation (of any type) and all the 30 official Deliverables to be submitted to the EC should be formatted according to this Deliverable template. These can be found in the CONDUCTOR SharePoint in the "WP7" folder.

2.2 Deliverables quality review and roles

As obvious from the synthesis of the Quality Control Board, each Deliverable is reviewed:

1. By the **Quality and Risk Manager** (BAX)
2. By the **Project Coordinator** (INTRA),
3. By the **Technical Manager** (JSI)

[1] SUBMITTED status is applied to documents that have been formally delivered to the EC.

[2] APPROVED status is applied to documents that have been formally delivered to the EC and accepted by the EC's reviewers in a review process.

4. By **two experts** from the consortium partners, as indicated in **Appendix II**

The Quality Manager (Ignacio Magallon - BAX) is the person who has the authority to manage all quality processes taking place in the project. His tasks are as follows:

a. Quality control of all tangible outcomes of the project (i.e. Deliverables, public reports, scheduled demonstrations), according to specifications and schedule defined in the DoA. In addition, management of all the relevant quality processes in this context (i.e. peer review of Deliverables).
b. Initiation of action to prevent the occurrence of any non-conformity to quality control processes.
c. Early recognition of non-conformity, recommendation of solutions, monitoring until problems' resolution and verification of solutions' implementation.

Specifically for Deliverables, the final consolidated review of each Deliverable is conducted by the Quality Manager. He is responsible for collecting all feedback from all individual (internal and external) peer reviews, consolidating them in one consolidated form for the author(s) that are sent to them for finalising their Deliverable and addressing the comments listed. During this consolidation process, the Quality Manager should also focus on the following aspects:

- Final verification of document executive summary and document information (ID, WP, authors)
- Respect the styles and format according to the principles defined in the Deliverable template and in this document.
- Language check.

In addition, the Quality Manager is responsible for checking/ensuring that the Final Deliverable returned by the author(s) upon the peer review comments are conforming to the consolidated peer review comments and, if not, a proper justification is requested from the author(s). Also, the Quality Manager is responsible for monitoring the overall process and managing the relevant documentation in SharePoint, while the Technical Manager and Project Coordinator will make the final quality check before submission.

2.2.1 Peer Review by internal experts

All project deliverables will be reviewed by the assigned project internal reviewers (technical experts from the consortium, assigned according to **Appendix II**) before submission to EC. The deliverables will be checked for relevance to the objectives, the scientific and technical value, the structure and completeness, the clarity of the presentation, and the overall appearance. The internal peer reviewers must review each Deliverable, concluding, finally, whether the Deliverable is accepted or not.

General comments

- Deliverable contents thoroughness
- Innovation level
- Correspondence to project and programme objectives

Specific comments

- Topic A: Relevance
- Topic B: Response to user needs/requirements/specifications
- Topic C: Methodological framework soundness
- Topic D: Quality of achievements
- Topic E: Quality of presentation of achievements
- Topic F: Deliverable Layout / Spelling / Syntax/ Format

The **final rating of the Deliverable** draft will be marked (by each) as:

- Fully accepted.
- Accepted with reservation.
- Rejected unless modified as suggested.
- Rejected

2.2.2 Review to be conducted by the Technical Management team

In addition to the internal peer reviewers, the technical management team, led by the Technical Manager (JSI) also reviews each Deliverable on the following principles:

- Technical thoroughness and response/fulfilment of the project objectives.
- Innovation and added value.
- Quality of outcomes presented.

2.2.3 Review by the Project Coordinator and submission

The final stage before submission of the Deliverable is its final check by the project Coordinator (INTRA) upon receipt by the author and confirmation by the Quality Manager (BAX) that it is ready for submission. The coordinator quickly reviews the document and if it has no objection, proceeds with the submission of an electronic copy to the EC via the online Funding & Tender Opportunities Portal within the appropriate timeframe and in the necessary format.

INTRA also archives backups and originals; and circulation of electronic copies to all project partners via the project SharePoint (denoting the SUBMITTED and later the APPROVED Deliverables). Upon request, INTRA submits hard copies of deliverables to EC within the appropriate timeframe and in the necessary quantities.

2.3 Deliverable preparation and peer review process

The Consortium reached a common understanding that the Deliverables are the tangible outcomes of the project and, as such, they must be of the highest quality possible. This is the responsibility of the Quality Manager and the Project Management Team to convey this message to all beneficiaries and ensure that this is indeed the case in the project duration. The quality processes defined in this document are a control measure towards the achievement of this goal. The deliverable preparation follows the stages listed below to ensure timely completion and submission:

- **60 days before:** The Deliverable Leader (DL) prepares the Initial Table of Contents and circulates it to contributors for inputs and comments.
- **50 days before:** After consolidating all inputs, the DL reaches an Agreement on the Table of Contents with contributors.
- **30 days before:** All contributing partners in compliance with the DL issue the 1st draft version of the deliverable.
- **20 days before:** The review team provides comments, improvements, and corrections. The DL addresses the review comments, prepares the 2nd draft version, and sends the deliverable to 2 project internal reviewers for final comments.
- **10 days before:** The 2 project's internal reviewers give feedback regarding the document.
- **5 days before:** The DL consolidates the final revised version of the deliverable (e.g. contributor, deliverable leader, reviewers) and sends it to the coordinator.
- **The Project Coordinator reviews in one calendar day and proceeds with submission**, acknowledging to the whole Consortium the submission of the Deliverable.

This delivery preparation process can be tailored and adjusted to suit the specific scope and contents of the individual deliverables. If a non-conformity issue is noticed, the Quality Manager/Coordinator request the author(s) for corrective actions before closing the Deliverable.

2.4 Submitted deliverables

Once approved by the EC Project Officer in the SyGMa Continuous Reporting system, the Public (PU) deliverables are automatically published to Community Research and Development Information Service (CORDIS) and on the CONDUCTOR website as appropriate. The list of deliverables submitted until M18 is shown below:

Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Delivery Date (month)
D1.1	Report on stakeholder requirements, userneeds and social innovations	WP1	14 – Deep Blue	6
D1.2	Specification of the future mobility systemand data sources	WP1	1 - INTRA	6
D1.3	Detailed use-case specifications and theirKPIs	WP1	8 - UT	6
D2.1	Specification and initial version of theadapted traffic and fleet management models	WP2	11 - NTUA	15
D2.2	Specification and initial version of the adapted multi-modality and interoperabilitymodels	WP2	1 - FRIC	15
D2.3	Specification and initial version of theadapted multi-resolution simulation models	WP2	6 - Aimsun	15
D2.4	Specification and initial version of theenhanced governance models	WP2	11 - NTUA	15
D3.1	Specification and initial version of data gathering, harmonization, fusion and analysis techniques	WP3	2 - JSI	15
D3.2	Specification and initial version of techniques for dynamic optimization and network load-balancing	WP3	9 - Deusto	15
D3.3	Specification and initial version of anomalydetection routines	WP3	1 - FRIC	15
D4.1	Development environment and CI/CDworkflows documentation	WP4	1 - INTRA	12
D4.2	CONDUCTOR Integrated System – initialversion	WP4	1 - INTRA	18
D5.1	Validation Strategy and Plan	WP5	14 – Deep Blue	18
D6.1	Initial Plan for dissemination and communication of results	WP6	10 - TUM	3
D6.2	Initial Exploitation plan	WP6	5 - BAX	3
D6.3	Updated plan for dissemination and communication of results	WP6	2 - JSI	18
D7.1	Project management Handbook	WP7	1 - INTRA	2
D7.2	First version of Data Management Plan	WP7	2 - JSI	6
D7.4	Safety, Risk and Ethics Reports – Initialversion	WP7	5 - BAX	18

3 ETHICS POLICY AND MONITORING

3.1 Ethics monitoring principles and structure

The Consortium is aware that the protection of personal data, fundamental rights and freedoms is of utmost importance and that the envisaged research activities must be compliant with legal and ethical rules. Therefore, CONDUCTOR ensures that ethical issues are given particular attention throughout the project and that all necessary measures are taken to minimize the negative impact on humans. Ethical, legal and privacy issues are constantly monitored and addressed at all consortium meetings. The consortium follows the opinions of various expert committees in the field, e.g., the European Group on Ethics (EGE) in science and new technologies to the European Commission (EU), as well as all relevant legislation on both European and national levels.

The procedures for the Ethics monitoring have been established in section 4 of Part B of the Grant Agreement and will follow the commonly agreed principles described in Article 14 of Part A of the Grant Agreement [2]. The current ethics monitoring is updated according to project needs.

3.2 Procedures for the protection of personal data

The CONDUCTOR consortium complies with all national legal and ethical requirements of the Member States where the research is performed. To protect the fundamental rights and freedoms of research participants, the CONDUCTOR will comply with the data protection principles set out below (Article 5. GDPR) [3]. When processing personal data, it ensures that these:

- are processed lawfully, fairly and in a transparent manner about the data subject (lawfulness, fairness, and transparency)
- are collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes ('purpose limitation')
- are adequate, relevant, and limited to what is necessary about the purposes for which they are processed ('data minimization')
- are accurate and, where necessary, kept up to date and that reasonable steps will be taken to ensure that inaccurate personal data, having regard to the purposes for which they are processed, are erased, or rectified without delay ('accuracy')
- CONDUCTOR is committed to upholding the Data Protection Principles. All personal data under its control will be processed by these principles.

Personal data collected from project partners for managing project activities remains confidential and will not be disclosed to third parties. The management of the CONDUCTOR website falls under the responsibility of JSI, the WP leader for Dissemination, Exploitation, and Communication. Meanwhile, the database containing CONDUCTOR contacts is overseen by INTRA, ensuring compliance with the EU General Data Protection Regulation (GDPR) [3] and upholding the protection of personal data.

It's crucial that personal data processing may extend beyond project implementation into post-project phases, necessitating ongoing adherence to data protection regulations. Partners must ensure comprehensive compliance, including notification procedures (e.g., Privacy Policy and Data Processing Agreements), and maintain robust security measures throughout and after the project duration.

3.3 Data management & ethics

All used assessment tools, data collection and analysis protocols within the CONDUCTOR project are verified in advance by the Risk, Quality and Ethics Manager (RQEM). The RQEM monitors and oversees the pilots, validation, and evaluation of CONDUCTOR results in terms of ethics, security, and privacy requirements.

CONDUCTOR makes data/research outputs findable, accessible, interoperable, and reusable (FAIR). A **Data Management Plan (DMP)** was issued, detailing what data the project generates, whether and how it is exploited or made accessible for verification and re-use, and how it will be curated and preserved. The first version of the DMP (D7.2) was provided at M6 of the project [4], which will be revised two months prior project's end, and submitted at M36. The consortium plans to deposit public data (see some examples in Table 5) in a research data repository. This will be a fully OpenAIRE-compliant repository (ZENODO).

All project outputs - documents and data of all types - will be open for comment, deposited in ZENODO (where all metadata is openly available under CC0 licence, and all content is openly accessible through open APIs), and published on the project web platform as soon as they are available (except individual questionnaires, which will be stored at each partner's premises). ZENODO provides DOI to all uploaded data, therefore the repository ensures that the data is assigned an identifier and resolves the identifier to a digital object.

Table 5. Use of data per use case

Use case	Confidentiality	Description
UC1	Sensitive	Public transit demand and telematics data are sensitive. The data is provided for the scope of this project. They will be used to optimise the public transit service of Athens, Greece. The generated data from the project will, however, be publicly available.
UC2	Public	All data services and associated data will be openly accessible. For business reasons, no historical data will be exposed.
UC3	Confidential	The raw mobile network data and the individual activity and travel diaries calculated from it can only be used by Nommon based on a private agreement with the mobile operator (Orange). The raw data of the shared mobility services will also not be publicly available. Access to them has yet to be determined with the data provider. Aggregated indicators extracted from them will be shared with the partners of CONDUCTOR. The Aimsun M-30 microsimulation model will have restricted access (private agreements with the Madrid City Council). The results/outputs of the simulation model and the Aimsun APIs developed will be shared with the partners.
	Public	Aggregated mobility indicators will be made available for research purposes via an open data repository.

CONDUCTOR collaborates with numerous organizations, individuals, and related projects to coordinate interviews, workshops, and various activities involving both internal and external stakeholders. Through these efforts, CONDUCTOR prioritizes the ethical handling of information, values, and data protection, aligning with the stipulations outlined in Articles 14 and 15 of the Grant Agreement [2]. While individual partners bear responsibility for their actions, INTRA, as the project coordinator, provides guidance and support to ensure adherence to the Data Management Plan (DMP).

Furthermore, each partner assumes responsibility for implementing necessary measures to safeguard the processing of research data essential for project activities, including:

- Employing technical and organizational safeguards to prevent unauthorized access, such as login restrictions and robust password protocols.
- Establishing clear access protocols for databases, including predefined user lists and access restrictions to prevent copying, printing, or downloading.
- Conducting data processing under stringent control and implementing appropriate security measures.
- Utilizing local encrypted storage methods, such as full hard disk encryption, to render data unintelligible.
- Securing data transmission through Hypertext Transfer Protocol Secure (HTTPS) communication via Secure Sockets Layer (SSL) encryption.

These measures align with legal provisions outlined in the Consortium Agreement [5] regarding data protection responsibilities (Article 15) and nondisclosure obligations (Article 13).

3.4 Data Collection & Storage

To protect the collected data and control unauthorized access to the CONDUCTOR data repositories, only authenticated personnel have access to the specific data collected. During the proposed system lifecycle, a holistic security approach is followed, to protect the pillars of information security (confidentiality, integrity availability) from a misuse perspective. The security approach was identified by a methodical assessment of security risks followed by their impact analysis, in line with Article 35 of the GDPR and any implementing local legislation (collectively referred to as the "EU Data Protection Legislation").

To this end, the partners ensure that no Personal Data (as such term is defined in the GDPR) is shared between the partners unless (i) it has been fully anonymized before the data sharing, or (ii) the specific partners who have elected to exchange or otherwise process Personal Data, have entered into separate data processing agreement and have determined what operational measures should be taken before such Personal Data exchange or processing, all by the EU Data Protection Legislation. This analysis is performed on the personal information and data processed by the proposed system, their flows and any risk associated with their processing.

D7.2 “First version of Data Management Plan“ [4], provided the details for the procedures for the data collection, storage, protection, retention, and destruction, in compliance with national and EU legislation.

4 RISK ASSESSMENT IN CONDUCTOR

4.1 Failure Mode and Effects Analysis (FMEA) Methodology

Failure Mode and Effects Analysis (FMEA) stands as a robust methodology designed to:

- Pinpoint potential failure modes within a product or process.
- Assess the associated risks of these failure modes, prioritizing them for corrective actions.
- Implement corrective measures to address the most critical concerns.

The FMEA methodology is a versatile tool, adaptable to various contexts and purposes. It plays a pivotal role in refining both product designs and process workflows, resulting in heightened reliability, enhanced quality, bolstered safety measures, augmented customer satisfaction, and diminished costs. Furthermore, it serves as a cornerstone for devising and refining maintenance schedules for repairable systems. It seamlessly integrates into control plans and other quality assurance frameworks. Additionally, it establishes a repository of failure mode and corrective action data, serving as a valuable resource for troubleshooting efforts and as an educational tool for emerging engineers.

Moreover, adherence to safety and quality standards, such as ISO 9001, Six Sigma, Food and Drug Administration (FDA) Good Manufacturing Practices (GMPs), and the Process Safety Management Act (PSM), often necessitates the implementation of FMEA practices.

In the context of the CONDUCTOR project, an extended version of the FMEA methodology, developed under the ADVISORS project [6], will be utilized. This extended methodology expands upon the classical FMEA by encompassing not only technical risks but also behavioural, legal, and operational considerations. Within the CONDUCTOR project, all processes and outcomes will undergo meticulous risk assessment using this extended methodology. Risks will be identified, and their severity assessed based on various characteristics, covering technical, behavioural, legal, and operational aspects. The significance of a risk will be evaluated based on its consequences, likelihood of occurrence, and detectability.

In essence, the risk assessment process within the extended FMEA methodology, as applied in the CONDUCTOR project, involves analysing potential hazards and estimating their magnitude, followed by an evaluation of the tolerability of these risks within their anticipated context. The steps involved in calculating risk within this extended methodology align closely with those of the original FMEA process, as illustrated in Figure 1 (D7.1) [1].

In the upcoming chapter, we extend a comprehensive description of the extended FMEA methodology as applied within the CONDUCTOR project. This detailed exposition unfolds the step-by-step implementation of the methodology within the project's framework.

Furthermore, we provide thorough elucidation of all parameters utilized in the extended FMEA analysis. Accompanying this explanation is a reference table dedicated to each parameter. These tables serve as invaluable resources, clarifying the significance of each parameter and outlining the criteria employed for assigning values.

Figure 1. Risk management process
Source: [1]

4.2 FMEA registry template & stepwise approach

Risk is an “event/issue” that may happen and have an impact on our project. The purpose of the Risk Management Plan is to prevent those events from happening or minimize their impact in case they happen.

CONDUCTOR is a complicated and demanding project, and its success highly depends on the effectiveness of the risk management process. The objective of the risk management procedure is to provide the processes and techniques for the evaluation & control of potential project risks, focusing on their precautionary diagnosis & handling. The Project Coordinator along with the Risk, Quality and Ethics Manager and with the cooperation of the General Assembly, the Technical Manager and the rest of the project management teams will be mainly responsible for handling risks and informing all partners when necessary.

4.2.1 Step 1: Identification and definition of risks

The first thing that needs to be done in the CONDUCTOR risk identification, is to recognise the areas of the project where the risks can occur. Based on various criteria (i.e. the significance of the solution and/or of the CONDUCTOR process, society readiness, technical aspects, etc.), all partners and as a minimum Activity and demo site leaders will be asked to identify and prioritise risks according to their expertise. For every risk identified, the risk severity, occurrence probability, detectability and recoverability will be estimated by the Core Group & Demo Sites leaders and the overall risk level will be calculated upon the given averaged numbers.

- **administrative and organization risks,** including lack or shortage of availability of key resources, withdrawal of the participation of a partner having a key role, lack of communication,
- **technical risks,** including technology replacement issues, inadequate system integration, inadequate project results, and

- **business and exploitation risks,** like the low interest of stakeholders, and insufficient impact in standards liquidation of a partner business during the project.

A baseline set of risks shall be identified and entered as a risk statement through a Risk Information Form. Each risk is identified by number (for configuration control) and has a responsible partner/person (s) assigned as a risk owner. The risk owner has the overall responsibility for risk management activities until the final closure of the risk.

4.2.2 Step 2: Risk Validation: assessment and analysis (Severity (S), Occurrence Probability (O), Detectability (D), Recoverability (R))

For each one of the risk types, a specific validation will be made. It is explained in detail how the ranking of each type of risk will be realised.

a. Severity (S)

The severity levels (S) for instance for technical failure are described below.

Table 6. Definition of unmitigated severity levels for technical risks.

Severity of unmitigated risk	Rate	Definition
Extremely severe	9-10	The failure could put user safety at risk.
Severe	7-8	The failure implies total loss of the solution availability causing major user's dissatisfaction.
Moderate	5-6	Failure implies the partial loss of the solutions' function causing user's dissatisfaction.
Slight	3-4	The failure implies slight dissatisfaction to the user.
Insignificant	1-2	The failure does not imply perceptible effects to the system function and to the user's satisfaction.

Mitigation strategies could involve implementing one of the alternative provisions identified in the FMEA or restricting the scope or function of the solution.

b. Risk Occurrence Probability (O)

It is the probability that all the risk causes related to the risk modes described in the analysis can occur. This is often a qualitative index especially when new technologies are concerned because of the few reliable data available.

Table 7. Occurrence indicator scale of risk analysis methodology

Occurrence Probability (O)	Technical issue
9 – 10 (HIGH)	It is certain that some failures will sometimes occur.
6 - 7 – 8 (MEDIUM)	A failure could occasionally occur.

Occurrence Probability (O)	Technical issue
3 - 4 – 5 (SLIGHT)	There is only a slight probability that an error/failure will occur.
1 – 2 (IMPROBABLE)	It is unlikely that a fault will occur.

c. Risk Detectability (D)

It is the probability of detecting the occurrence of a risk mode identified in Step 1 of the methodology. Detection of a developing risk is an important aspect of overall risk management, as early detection is a prerequisite for the application of mitigation strategies. Detectability is assigned a value between 1 and 10 (1 means that it is always perfectly detectable and 10 that it is always undetectable).

Table 8. Detectability indicator scale of risk analysis methodology.

Detectability (D)	Technical issue
9 – 10 (IMPROBABLE)	It is impossible or improbable that a problematic area will be detected.
7 – 8 (SLIGHT)	The problematic area is detected only in particular cases.
5 – 6 (MODERATE)	It is probable that the problem will be detected (depending on the situation).
3 – 4 (HIGH)	It is very probable that a problem will be detected.
1 – 2 (VERY HIGH)	It is certain that a problem will be detected.

d. Recoverability (R)

It is an efficacy index of the possible recovery action performed by the risk management procedures implemented in the Scenario. It estimates the ability of the solution to tolerate the risk. The effectiveness is valued in terms of recoverability which is assigned a value between 1 and 10 (10 represents not recoverable and 1 is always perfectly recoverable).

Table 9. Recoverability indicator scale of risk analysis methodology.

Recoverability (R)	Technical issue
9 – 10 (NULL)	No recovery action is provided.
6 - 7 – 8 (LOW)	The user is only advised on the failure.
3 - 4 – 5 (HIGH)	Effective recovery actions are provided.
1 – 2 (TOTAL)	The failure effect is completely avoided by the recovery action.

4.2.3 Step 3- Final risk validation number

After the risk classification in each of the four domains, an overall relative indication of risk may be useful and for this reason, the extended FMEA calculates a Risk Number (RN) for each risk identified, using the following formula:

Risk Number = $S * O * \left\lceil \frac{D+R}{2} \right\rceil$

This calculation is applied to each risk area to generate a risk number. The results of this equation may vary from 0 to 1000 depending on the validity of each failure mode's risk. Normally, organisations select a pre-defined range for the RN, i.e. above 500 in the 0-1000 scale for which risks a mitigation strategy should be implemented. This is done to optimise the use of resources and minimise costs.

The results of the risk number can be translated using the following table, which the FMEA methodology has established.

Table 10. Results of the Risk Number.

Overall risk factor	Overall severity	Mitigation possibility
513-1000	I- Extremely severe	Very High
217-512	II- Severe	High
65-216	III - Moderate	Medium
9-64	IV - Slight	Low
1-8	V - Insignificant	Improbable

The overall Risk Number helps in evaluating the most critical risks. A critical risk mode is a risk which is very dangerous in its effects, which occurs rather often, is not detected by the internal diagnosis and there is no recovery action performed over its effects.

4.2.4 Step 4- Mitigation strategies identification

The issues identified as risks have been further analysed to determine the possibility of mitigating strategies. Risk reduction is an iterative process involving dependencies between different issues. In terms of mitigation strategies, risk can be reduced in several generic ways:

1. reducing the probability of the hazard occurring;
2. increasing failure detection speed and probability;
3. reducing the magnitude (severity) of the consequences of the potential hazard;
4. protecting against the risk - mitigating strategies to compensate for a failure (e.g. back-ups).

One advantage of this approach is its consistency between the different domains.

The mitigation strategies are presented in the column of Step 4 in the extended FMEA template (see Table 11).

Table 11. Extended risks assessment methodology template, Step 3.

Definition of Risk	Type of Risk	Relevant WP(s)	S	O	D	R	Risk Number	Problem severity	Risk Mitigation Measures
	❑Technical ❑ ❑								

Risk mitigation planning

Risk mitigation planning identifies, evaluates, and selects options to lower risk at acceptable levels given program constraints and objectives.

This can be accomplished through a reduction in likelihood, a reduction in consequences, or a combination of both. It includes the specifics of what should be done, when it should be accomplished, who is responsible, and the resources required to implement the risk mitigation plan.

Risk tracking

The final key activity is risk tracking which is the activity of systematically tracking and evaluating the performance of risk mitigation actions. The PC monitors progress and regularly updates risk status and information. Risk tracking is a feedback procedure where risk abatement plans may be revised or updated based on risk status updates. If the plan is not effective, alternative plans must be put in place to ensure that risk is appropriately handled.

A project risk register is to be kept and reviewed at the consortium meetings. For each identified risk, the Risk Register shall detail at least:

- Risk ID
- Risk description (event, causes, impact)
- Assessment
- Managing Work Package(s)
- Risk owner
- Risk status (Open / Occurred / Not occurred / Cancelled)
- A list of envisaged solutions/mitigation plan
- The deadline for decision
- Progress/comments

4.3 CONDUCTOR risk assessment results

Table 12. Risk assessment matrix

#	Definition of Risk (status)	WPs	Responsible	Type of Risk	(S)	(O)	(D)	(R)	Risk number	Risk Mitigation Measures
1	Stakeholder requirements not well formulated (closed risk)	WP1	JSI (Luka Bradeško)	Technical risks	5,0	2,0	2,0	2,0	20	The project partners have established collaborations with major stakeholders from different bodies/cities and will target indicative stakeholders to collect the correct requirements.
2	Delay in the adaptation and integration of models (active)	WP2	UT (O. Eikenbroek)	Technical risks	5,0	2,0	1,0	3,0	20	The models to be considered are mostly mature and already proved in transportation domain.
3	Simulations too computationally expensive to run in the context of a full scale (active)	WP2	UT (O. Eikenbroek)	Other	5,0	2,0	2,0	4,0	30	Existing simulation environments support expensive simulation models.
4	Advanced AI approaches do not behave in a repeatable way	WP3	FRONTIER (Panos Georgakis)	Technical risks	2,0	5,0	1,0	3,0	20	Selecting and using the state-of-the-art approaches that ensure repeatability and poses explainability.
5	Insufficient data, and/or access restrictions (active).	WP3	FRONTIER (Panos Georgakis)	Technical risks	5,0	5,0	1,0	3,0	50	The partners involved in the proposal are aware of the data requirements and committed to share their data in frames of the project. Already collected logistic data for Munich (GE) can be used to create multiple transferable scenarios for the simulations.

										The possibility to buy data will be considered if needed.
6	Low data quality (noise, incompleteness, …) (active)	WP3	FRONTIER (Panos Georgakisi)	Technical risks	2,0	5,0	2,0	3,0	25	Definition of default values and application of techniques to deal with noise and incompleteness
7	Data from case studies are not sufficient or not available in time to start the development of the methods (active)	WP3	FRONTIER (Panos Georgakis)	Administrative and organization risks	5,0	5,0	2,0	3,0	62,5	Start initial development on datasets from other environments (publicly available datasets and data collected for other projects) and fine-tune the models later to the specific case studies.
8	Excessive computational time required by the dynamic optimization and network balance methods to provide good enough solutions (active)	WP3	FRONTIER (Panos Georgakis)	Technical risks	5,0	5,0	1,0	3,0	50	Simplification the constraints considered in the optimization models according to their priority of fulfilment in each environment.
9	A model or method is not ready for integration (active)	WP4	INTRA (Nasos Grigoropoulos)	Technical risks	5,0	6,0	2,0	7,0	135	Each building block can be validated independently from the others and the system will be modular to allow incremental validation as new building blocks are included
10	A building block of the CONDUCTOR system fails to meet the expected performance on some validation test (active)	WP4	INTRA (Nasos Grigoropoulos)	Technical risks	9,0	3,0	4,0	7,0	148,5	The models/methods will be iteratively refined based on the validation test feedback
11	Validation of use-cases will not be realistic (active)	WP5	NTUA (Eleni Vlahogianni)	Technical risks	5,0	7,0	4,0	5,0	157,5	Consortium partners on the project to work together to define the best possible Use-cases, along with focusing on the feasibility of the validation of the proposed activities

12	Imprecise impact assessment evaluation (active)	WP5	NTUA (Eleni Vlahogianni)	Technical risks	5,0	7,0	5,0	2,0	122,5	Consortium partners to assess together the magnitude of the impact, while already at WP1 the appropriate KPIs are set
13	Disagreements on foreground IPR, access rights and exploitation (active)	WP6	JSI (Vida Vukašinović)	Administrative and organization risks	8,0	2,0	5,0	3,0	64	The project coordinator will facilitate resolution, if needed with the support of an external advisory board.
14	A key member staff leaving the project consortium (active)	WP7	INTRA (Flavien Massi)	Administrative and organization risks	3,00	7,0	1,0	1,0	21	The partner notifies the coordinator prior the leave of the staff concerned and describe its implication for the project. A replacement staff must be appointed by the partner to take over the role and duties of the leaving staff to avoid delays in the project activities.
15	Partner leaving the consortium (active)	WP7	INTRA (Flavien Massi)	Administrative and organization risks	9,0	2,0	1,00	4,00	45	The partner notifies the coordinator about its withdrawal of the consortium and provide an official letter describing the reason. An amendment will be opened by the coordinator and will follow the official guidelines from the EC. The coordinator assisted by the partners will identify a replacement partner to perform the remaining activities. The activities and budget of the leaving partner will be split between the existing partners with relevant expertise.
16	Delay due to not meeting critical deadlines (active)	WP1-7	INTRA (F. Massi)	Administrative and organization risks	3,00	6,0	2,0	5,0	63	The coordinator is monitoring the delivery of activities and possible delays during the monthly EB/GA meetings. In case of possible delay, the WP/Task leaders are asked to provide a realistic contingency plan and a revised delivery date. The impacts on other WPs/Tasks/activities are assessed and the project time plan is updated accordingly while extra efforts will be requested from the partners.
17	Exceeding processing time of tasks (active)	WP1-7	INTRA (F. Massi)	Administrative and organization risks	2,0	7,0	2,0	4,0	42	Frequent control of milestones and deliverables is conducted monthly. In case a deviation (time and/or effort) is detected, a review of the task action plan will be conducted, and partners will be encouraged to put extra efforts.

18	Issues between partners (active)	WP1-7	INTRA (F. Massi)	Administrative and organization risks	5,0	4,0	4,0	4,0	80	The CA (signed by all partners) describes the conflict resolution methods. A continuous communication between partners is expected to create common understanding. If the issue is not solved, it will be officially addressed during an exceptional GA meeting and all the consortia will be asked to vote to find a solution.
19	Insufficient quality and scope of partners work (active)	WP1-7	JSI (Gregor Papa)	Technical risks	5,0	7,0	3,0	5,0	140	A quality management plan is provided. Task leaders will need to propose an action plan to the WP leader at the beginning of the task. If problems in quality of the work detected, the Technical Manager will be in contact with the WP/Task leader to revise the work and support organisation of actions to reach the goals.

4.4 CONDUCTOR risk analysis

Based on the inputs from the partners, the overall Risk Number helps us evaluate the most critical risks. Fortunately, all the risks in CONDUCTOR have overall risk factors between 20 and 157,5 meaning a slight and moderate severity (see Table 12).

It is important to highlight two main comments from the WP Leaders. For the risk of validation of use cases (#11, risk score 157.5), NTUA (WP5) mentioned that the partners have worked together to define the best possible use cases specifications and scenarios. The consortium spent the first 2 months of WP2 clearly defining the specific areas of each use case and the technologies that were piloted, focusing on the feasibility and relevancy of the validation process. Further risk assessment will be carried out along with its mitigation measures in the implementation phase (i.e., revision of the starting date of the real-life demonstration).

On the other hand, the risk of lack of financial resources is not included in the matrix (risk number 0), as the financial capacity of the partners has been assessed to ensure their financial resources during the project execution. In this case, convergence methods are discussed on the Grant Agreement (GA) level to find solutions for the concerned partner.

Table 13. Analysis of the CONDUCTOR risk matrix

Overall risk factor	Overall severity	Mitigation possibility	Risk ID
65-216	III - Moderate	Medium	#9,10,11,12,18,19
9-64	IV - Slight	Low	#1,2,3,4,5,6,7,8,13,14,15,16,17

5 FUTURE STEPS

Based on the analysis of the risk of the project on M18, the Quality and Ethics Manager (RQEM - BAX), will continue with the periodic monitoring until M36 including the next activities:

- **Risk Prioritization**: based on the ranking carried out in this report, special attention will be put to the most activities with the highest risk number. The project will focus resources on addressing the most significant risks first.
- **Risk Mitigation Planning**: the project will follow the strategies to mitigate the highest priority risks. This may involve implementing controls, transferring the risk to a third party, avoiding the risk altogether, or accepting the risk if its impact is deemed acceptable.
- **Contingency Planning**: the project will develop contingency plans for risks that cannot be fully mitigated. Contingency plans outline actions to be taken if a risk event occurs, helping to minimize its impact on the project.
- **Monitoring and Review**: RQEM will continuously monitor the project environment for changes that could affect identified risks. Regularly review and update the risk matrix as new information becomes available or as the project progresses.
- **Communication and Reporting**: RQEM will keep stakeholders informed about the identified risks, mitigation strategies, and any changes to the risk landscape. Clear communication helps ensure that everyone involved understands their roles and responsibilities in managing project risks.
- **Risk Response Execution**: RQEM will implement the planned risk mitigation strategies and contingency plans as necessary. This may involve allocating resources, updating project documentation, or making changes to project activities accordingly.
- **Risk Documentation**: RQEM will document all aspects of the risk management process, including the risk matrix, risk mitigation plans, contingency plans, and any changes made throughout the project.

6 BIBLIOGRAPHY

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[4] CONDUCTOR , „D7.2 First version of Data Management Plan," 2023.

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A. APPENDIX

APPENDIX I - Deliverables list

Deliverable No	Deliverable Name	Work Package No	Lead Beneficiary	Type	Dissemination Level	Due Date (month)
D1.1	Report on stakeholder requirements, userneeds and social innovations	WP1	14 – Deep Blue	R — Document, report	PU - Public	6
D1.2	Specification of the future mobility systemand data sources	WP1	1 - INTRA	R — Document, report	SEN - Sensitive	6
D1.3	Detailed use-case specifications and theirKPIs	WP1	8 - UT	R — Document, report	PU - Public	6
D2.1	Specification and initial version of the adapted traffic and fleet management models	WP2	11 - NTUA	R — Document, report	SEN - Sensitive	15
D2.2	Specification and initial version of the adapted multi-modality and interoperabilitymodels	WP2	1 - FRIC	R — Document, report	SEN - Sensitive	15
D2.3	Specification and initial version of the adapted multi-resolution simulation models	WP2	6 - Aimsun	R — Document, report	SEN - Sensitive	15
D2.4	Specification and initial version of the enhanced governance models	WP2	11 - NTUA	R — Document, report	PU - Public	15
D2.5	Final implementations of models	WP2	8 - UT	R — Document, report	SEN - Sensitive	30
D3.1	Specification and initial version of	WP3	2 - JSI	R — Document, report	PU - Public	15
	data gathering, harmonization, fusion, and analysis techniques					
D3.2	Specification and initial version of techniques for dynamic optimization and network load-balancing	WP3	9 - Deusto	R — Document, report	PU - Public	15

D3.3	Specification and initial version of anomalydetection routines	WP3	1 - FRIC	R — Document, report	PU - Public	15
D3.4	Final harmonization, fusion, optimization, detection and balancing approaches	WP3	1 - FRIC	R — Document, report	PU - Public	30
D4.1	Development environment and CI/CD workflows documentation	WP4	1 - INTRA	R — Document, report	SEN - Sensitive	12
D4.2	CONDUCTOR Integrated System – initialversion	WP4	1 - INTRA	DEM — Demonstrator,pilot, prototype	SEN - Sensitive	18
D4.3	CONDUCTOR Integrated System – final version	WP4	1 - INTRA	DEM — Demonstrator,pilot, prototype	SEN - Sensitive	30
D5.1	Validation Strategy and Plan	WP5	14 – Deep Blue	R — Document, report	PU - Public	18
D5.2	Impact evaluation framework and dedicated	WP5	14 - BAX	R — Document, report	PU - Public	24
D5.3	Report on Use cases execution and their validation	WP5	11 - NTUA	R — Document, report	SEN - Sensitive	36
D5.4	Report on impact assessment of Use cases	WP5	5 - BAX	R — Document, report	PU - Public	36
D6.1	Initial Plan for dissemination andcommunication of results	WP6	10 - TUM	R — Document, report	PU - Public	3
D6.2	Initial Exploitation plan	WP6	5 - BAX	R — Document, report	SEN - Sensitive	3
D6.3	Updated plan for dissemination and communication of results	WP6	2 - JSI	R — Document, report	PU - Public	18
D6.4	List of market activities to engage furtherupscale	WP6	12 - Nommon	R — Document, report	SEN - Sensitive	24
D6.5	Final list of dissemination andcommunication activities	WP6	2 - JSI	R — Document, report	PU - Public	36
D6.6	Updated exploitation plan	WP6	5 - BAX	R — Document, report	SEN - Sensitive	36
D7.1	Project management Handbook	WP7	1 - INTRA	R — Document, report	SEN - Sensitive	2
D7.2	First version of Data Management Plan	WP7	2 - JSI	DMP — Data Management Plan	PU - Public	6

D7.3	Data Management Plan - Final version	WP7	2 - JSI	DMP — Data Management Plan	PU - Public	36
D7.4	Safety, Risk and Ethics Reports – Initial version	WP7	5 - BAX	R — Document, report	PU - Public	18
D7.5	Safety, Risk and Ethics Reports – Final version	WP7	5 - BAX	R — Document, report	PU - Public	36

Appendix II Deliverables list, delivery month and assigned peer reviewers

No	Deliverable Name	Leader	Type	Diss. Level	Due date	Reviewers
D1.1	Report on stakeholder requirements, user needs and social innovations	Deep Blue	R	PU	6	UT, BAX
D1.2	Specification of the future mobility system and data sources	INTRA	R	SEN	6	FRO, Aimsun
D1.3	Detailed use-case specifications and their KPIs	UT	R	PU	6	Deep Blue, NTUA
D2.1	Specification and initial version of the adapted traffic and fleet management models	NTUA	R	SEN	15	TUM, RIDANGO
D2.2	Specification and initial version of the adapted multi-modality and interoperability models	FRIC	R	SEN	15	INTRA, UT
D2.3	Specification and initial version of the adapted multi-resolution simulation models	Aimsun	R	SEN	15	INTRA, UDeusto
D2.4	Specification and initial version of the enhanced governance models	NTUA	R	PU	15	OASA, FRO
D2.5	Final implementations of models	UT	R	SEN	30	TUM, NTUA
D3.1	Specification and initial version of data gathering, harmonization, fusion and analysis techniques	JSI	R	PU	15	INTRA, UT
D3.2	Specification and initial version of techniques for dynamic optimization and network load-balancing	UDeusto	R	PU	15	NTUA, Nommon
D3.3	Specification and initial version of anomaly detection routines	FRIC	R	PU	15	Aimsun, UT
D3.4	Final harmonization, fusion, optimization, detection and balancing approaches	FRIC	R	PU	30	Aimsun, NTUA
D4.1	Development environment and CI/CD workflows documentation	INTRA	R	SEN	12	JSI, GoOpti
D4.2	CONDUCTOR Integrated System – initial version	INTRA	DEM	SEN	18	JSI, UDeusto
D4.3	CONDUCTOR Integrated System – final version	INTRA	DEM	SEN	30	JSI, UDeusto

D5.1	Validation Strategy and Plan	Deep Blue	R	PU	12	BAX, Nommon
D5.2	Impact evaluation framework and dedicated KPIs	BAX	R	PU	18	Deep Blue, Nommon
D5.3	Report on Use cases execution and their validation	NTUA	R	SEN	24	OASA, JSI
D5.4	Report on impact assessment of Use cases	BAX	R	PU	36	OASA, JSI
D6.1	Initial Plan for dissemination and communication of results	JSI	R	PU	3	Nommon, INTRA
D6.2	Initial Exploitation plan	BAX	R	SEN	3	GoOpti, FRIC
D6.3	Updated plan for dissemination and communication of results	TUM	R	PU	18	OASA, INTRA
D6.4	List of market activities to engage further upscale	Nommon	R	SEN	24	RIDANGO, GoOpti
D6.5	Final list of dissemination and communication activities	JSI	R	PU	36	INTRA, Almelo
D6.6	Updated exploitation plan	BAX	R	SEN	36	GoOpti, FRIC
D7.1	Project management Handbook	INTRA	R	SEN	2	Aimsun, UDeusto
D7.2	First version of Data Management Plan	JSI	DMP	PU	6	TUM, BAX
D7.3	Data Management Plan - Final version	JSI	DMP	PU	36	TUM, BAX
D7.4	Safety, Risk and Ethics Reports – Initial version	BAX	R	PU	18	Deep Blue, RIDANGO
D7.5	Safety, Risk and Ethics Reports – Final version	BAX	R	PU	36	Deep Blue, RIDANGO

B. ABBREVIATIONS AND DEFINITIONS

Acronym	Definition
CCAM	Cooperative, Connected and Automated Mobility
CORDIS	Community Research and Development Information Service
DMP	Data Management Plan
EC	European Commission
EGE	European Group on Ethics
FDA	Food and Drug Administration
FMEA	Failure Mode and Effects Analysis
GA	Grant Agreement
GDPR	General Data Protection Regulation
GMPs	Good Manufacturing Practices
HTTPS	Hypertext Transfer Protocol Secure
PC	Project Coordinator
PSM	Process Safety Management Act
RN	Risk Number
RQEM	Risk, Quality and Ethics Manager
SSL	Secure Sockets Layer
TM	Technical Manager