5GMOBIX

5G for cooperative & connected automated MOBIlity on X-border corridors

Project Management Plan

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Control sheet

Version history			
Version	**Date**	**Modified by**	**Summary of changes**
V0.1	21/12/2018	François Fischer, Rita Bhandari (ERTICO)	Draft for peer review
V0.2	26/12/2018	Rita Bhandari (ERTICO)	Update of Gantt chart, PMT roles, legal disclaimer
V1.0	31/12/2018	Rita Bhandari (ERTICO)	Submitted version
V1.1	28/01/2019	Rita Bhandari (ERTICO)	Submitted version with correct header and Gantt chart
V2.0	15/10/2019	François Fischer, Rita Bhandari (ERTICO)	Re-submitted version with corrections following feedback from PO/reviewers
V3.0	15/04/2020	Francois Fischer	Re-submitted version with corrections following feedback from PO/reviewers: improve governance, technical management and risk management
V3.1	22/04/2020	Francois Fischer	Peer reviewed version
V4.0	12/04/2021	Coen Bresser	Updated tables, figures to reflect current status. Improved governance, improved risk management. Added COVID implications

V4.1	10/02/2022	Coen Bresser	Update of Risk management, update of the Advisory Board, GANTT, Deliverable dates, check on earlier reviews, details in Appendix III
V5.0	14/02/2022	Coen Bresser	Peer reviewed version

Peer review		
	Reviewer name	**Date**
Reviewer 1	Kostas Trichias (WINGS)	10/02/2022
Reviewer 2	Marie-Laure Watrinet (LIST)	22/02/2022

Legal disclaimer

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ABBREVIATIONS

Abbreviation	Definition
CBC	Cross Border Corridor
CCAM	Cooperative, Connected and Automated Mobility
DoA	Description of Action
EAB	External Advisory Board
EC	European Commission
FMEA	Failure Mode and Effect Analysis
GA	General Assembly
NDA	Non-Disclosure Agreement
OEM	Original Equipment Manufacturer
ORDP	Open Research Data Pilot
PC	Project Coordinator
PERT	Programme Evaluation Review Technique
PESTLE	Political, Economical, Soci(et)al, Technical, Environmental, Legal
PM	Person Month
PMT	Project Management Team
PO	Project Officer
RPN	Risk Priority Number
SAE	System Architecture Evolution
SME	Small and Medium-Sized Enterprises
TMT	Technical Management Team
TS	Trial Site
TSL	Trial Site Leader
WP	Work Package
WPL	Work Package Leader
X-border	Cross-border

EXECUTIVE SUMMARY

The aim of 5G-MOBIX (the Project) is to match the benefits of 5G technology with advanced Cooperative, Connected and Automated Mobility (CCAM) use cases in order to validate the viability of the technology to bring automated driving to the next level of vehicle automation (SAE L4 and above). 5G-MOBIX's vision is to enable innovative, previously unfeasible, automated driving applications, both from a technical as well as from a business perspective.

The Project's ambitious work plan includes cyclic iterations of specifications, development, trials and evaluation activities. Testing and validation of the 5G technology for advanced CCAM will be carried out along eight trial sites, which include cross-border and urban corridors. There are also cross-cutting activities to maximise impact related to deployment enablers and communication and dissemination of the Project's results. The Project Consortium includes 50 beneficiaries* and an additional nine international partners from Korea and China bringing the total partners involved to 59. This large Consortium will share responsibilities of tasks divided into eight Work Packages (WPs) across 10 EU countries as well as in Turkey, China and Korea.

In working towards its ultimate goal of the roll out of 5G networks to support CCAM, 5G-MOBIX is determined to realise its objective in a societally acceptable and ethical manner consistent with the H2020 programme. The scale and complexity of the Project, both in terms of innovation and the partners involved, call for a carefully designed management plan for the Project.

The present document fulfills the requirement of deliverable D1.1 – *Project Management Plan* – of 5G-MOBIX within WP1. Deliverable D1.1 lays out the organisational structure and the management procedures and processes that 5G-MOBIX will employ in order to ensure that that workflow is smooth and a good system of internal communication exists to ensure the efficient running of the Project. The plan described in this document has a direct bearing on the performance of Task T1.1 – *Administrative and financial coordination* and Task T1.2 – *Technical coordination*.

Deliverable D1.1 is structured as follows:

Chapter 1 – *Introduction* – outlines the concept and approach of 5G-MOBIX. It elaborates the purpose of this deliverable as a plan for coordinating the Project, intended for Consortium members and the European Commission.

Chapter 2 – *Project overview* – outlines the Project concept and approach, and describes consortium mix, the Project work plan, including work packages and tasks as well as the main deliverables and milestones.

Chapter 3 – *Project management* – describes the management structure covering both operational and strategic management. The responsibilities of the different bodies and their role in the Project Management Team, which is the leading operational body of the project, are described. The chapter also details the

* Six of these beneficiaries and one international partner are included in the Grant Agreement amendment.

management processes and procedures. The overall project management processes relate to progress reporting and evaluation of results, planning and implementation of changes, project administration and contract management, project meeting procedures and project management tools and services. The management procedures described have to do with conflict resolution, resource use and payment rules. Finally, the chapter describes the technical management procedures with details of risk management.

Chapter 4 is the *Conclusion.*

This deliverable draws substantially from the 5G-MOBIX Grant and Consortium Agreements and together with these documents will serve as a central reference for all project coordination matters.

1. INTRODUCTION

1.1. Purpose of the deliverable

Deliverable D1.1 – *Project Management Plan* – outlines the management strategy and tools that will ensure the effective execution of Task T1.1 – *Administrative and Financial Coordination* – and Task T1.2 – *Technical Coordination*. It describes the governance bodies, relevant meetings, and the internal rules and procedures relating to or complementing the Grant Agreement and the Consortium Agreement, and includes the Risk Management Procedures.

Deliverable D1.1 will be complemented by D1.2 – *Quality Management Plan*, D1.3 – *Innovation Management Plan,* and D1.4 – *Data Management Plan* to provide an overall strategy for organisation and execution of core tasks to achieve the objectives of the Project Coordination work package (WP1) in terms of, both, operational and technical coordination.

1.2. Status of the deliverable

The information used in the deliverable and the situation description of the project management procedures is based on the consortium and project plan situation as in the project amendment AMD-825496-33. The deliverable also provides updates and corrections, following the recommendations made during the 3rd technical review from October 2021.

1.3. Intended audience

The dissemination level of D1.1 is 'public' (PU) and available to members of the consortium, the Commission Services and those external to the project. This document is primarily intended to serve as an internal guideline and reference for all 5G-MOBIX beneficiaries, especially the governance bodies such as the General Assembly, the Project Management Team, and the External Advisory Board.

1.4. Effects of the COVID-19 pandemic on Project Management

As requested during the P1 review. The COVID-19 pandemic has affected Project Management in the sense that it is the most frequent cause of interference in the project plan. The COVID-19 pandemic has been listed as a risk and is available on the EU portal under nr. 15. The risk has been reformulated since to capture the full extent of the mitigating measures. The risk can be found marked in table 19 in Appendix II, as nr. 14 on the list with RPN 140. The main effect of the pandemic on Project Management is continuously update the timelines and plans to ensure the effects on the Project's results are limited to non-existing. To achieve this, the main mitigating measures we have implemented are monitoring for early detection of deviations and the requirement of having alternative plans when travel, close cooperation or on-site effort are needed. The measures currently pay off in that we have an early view and the timelines seem to be no longer affected unexpectedly.

2. PROJECT OVERVIEW

2.1. 5G-MOBIX concept and approach

5G-MOBIX aims to showcase the added value of 5G technology for advanced Cooperative, Connected and Automated Mobility (CCAM) use cases and validate the viability of the technology to bring automated driving to the next level of vehicle automation (SAE L4 and above). To do this, 5G-MOBIX will demonstrate the potential of different 5G features on real European roads and highways and create and use sustainable business models to develop 5G corridors. 5G-MOBIX will also utilize and upgrade existing key assets (infrastructure, vehicles, components) and the smooth operation and co-existence of 5G within a heterogeneous environment comprised of multiple incumbent technologies such as ITS-G5 and C-V2X.

5G-MOBIX will execute CCAM trials along cross-border (x-border) and urban corridors using 5G core technological innovations to qualify the 5G infrastructure and evaluate its benefits in the CCAM context. The Project will also define deployment scenarios and identify and respond to standardisation and spectrum gaps.

5G-MOBIX will first define critical scenarios needing advanced connectivity provided by 5G, and the required features to enable some advanced CCAM use cases. The matching of these advanced CCAM use cases and the expected benefits of 5G will be tested during trials on 5G corridors in different EU countries as well as in Turkey, China and Korea.

The trials will also allow 5G-MOBIX to conduct evaluations and impact assessments and to define business impacts and cost/benefit analysis. As a result of these evaluations and international consultations with the public and industry stakeholders, 5G-MOBIX will identify new business opportunities for the 5G enabled CCAM and propose recommendations and options for its deployment.

Through its findings on technical requirements and operational conditions 5G-MOBIX is expected to actively contribute to standardisation and spectrum allocation activities.

2.2. Consortium

2.2.1. Beneficiaries

The 5G-MOBIX Consortium is specifically built around the ICT-18 call requirements to evaluate 5G technologies for automated mobility, to address standardisation needs, and to provide recommendations and options for 5G deployment scenarios for automated mobility. The roll out of 5G networks to support CCAM requires effective harmonisation of the deployment agendas at EU level and beyond. For this reason, 5G-MOBIX has opted to include a large set of partners from 10 EU Member States as well as Turkey, China and South Korea. The consortium thus represents stakeholders from major research organisations actively involved in national and EU 5G projects, telecom operators, telecom and IT manufacturers, automotive suppliers, OEMs, road operators, public authorities responsible for traffic management, transport industries as well as city councils and SMEs. This rich consortium allows 5G-MOBIX to mobilise a high number of

complementary participants, which is necessary to provide the expected deployment scenarios and business models matching EU and international needs.

Table 1: 5G-MOBIX beneficiaries

ID #	Short name	Beneficiary name	Country
1	ERT	EUROPEAN ROAD TRANSPORT TELEMATICS IMPLEMENTATION COORDINATION ORGANISATION S.C.R.L.	BE
2	AALTO	Aalto-korkeakoulusäätiö	FI
3	AEVAC	Asociación española vehículo autónomo y conectado	ES
4	AKKA	AKKA Informatique et Systèmes	FR
5	ALSA	ALSA GRUPO S.L. UNIPERSONAL	ES
7	ATOBE	BRISA INOVACAO E TECNOLOGIA SA	PT
8	CATAPULT	Satellite Applications Catapult	GB
9	CCG	Centro de Computação Gráfica	PT
10	COSM	COSMOTE	GR
11	CTAG	FUNDACION PARA LA PROMOCION DE LA INNOVACION, INVESTIGACION Y DESARROLLO TECNOLOGICO EN LA INDUSTRIA DE AUTOMOCION DE GALICIA	ES
13	DEKRA	DEKRA Testing and Certification S.A.U.	ES
14	DGT	DIRECCION GENERAL DE TRAFICO	ES
15	ERICSGR	Ericsson Hellas	GR
16	FORD	Ford Otosan	TR
17	FRAUN	Fraunhofer IAO	DE
18	GTARC	GT-ARC gemeinützige GmbH	DE

ID #	Short name	Beneficiary name	Country
~~19~~	~~HELM[1]~~	~~Gemeente Helmond~~	~~NL~~
20	ICCS	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS	GR
21	IMT	Instituto da Mobilidade e dos Transportes, I.P.	PT
22	INFRAPT	Infraestruturas de Portugal	PT
23	INTRA	Intrasoft International S.A.	LU
24	ISEL	Instituto Superior de Engenharia de Lisboa	PT
25	IT	Instituto de Telecomunicações	PT
26	KPN	Koninklijke KPN NV	NL
27	LIST	Luxembourg Institute of Science and Technology	LU
28	NOKIASP	NOKIA BELL LABS	ES
29	NORTE	AUTO - ESTRADAS NORTE LITORAL SOCIEDADE CONCESSIONARIA - AENL SA	PT
30	SENSIBLE4	Sensible 4 Oy	FI
31	SIEMENS	Siemens Portugal	PT
32	TELEFONICA	Telefónica Investigación y desarrollo SAU	ES
33	TIS	Tis.pt, Consultores em Transportes, Inovação e Sistemas, SA	PT
34	TNO	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO	NL
35	TUB	(DAI Labor) Technische Universität Berlin	DE
36	TUE	Technische Universiteit Eindhoven	NL

[1] Helmond has left the project in June 2020

ID #	Short name	Beneficiary name	Country
37	TURKCELL	Turkcell Technology	TR
38	UL	University of Luxembourg	LU
39	UMU	Universidad de Murcia	ES
40	VALEO	VALEO Schalter und Sensoren	DE
41	VED	VEDECOM FONDATION PARTENARIALE MOV'EOTEC	FR
42	VICOM	FUNDACIÓN CENTRO DE TECNOLOGÍAS DE INTERACCIÓN VISUAL Y COMUNICACIONES Vicomtech	ES
43	VIGO	CONCELLO DE VIGO	ES
44	VTT	Teknologian tutkimuskeskus VTT Oy	FI
45	WINGS	WINGS ICT solutions	GR
46	NOKIAPT	NOKIA SOLUTIONS AND NETWORKS PORTUGAL, S.A.	PT
47	ERICSTR	ERICSSON ARASTIRMA GELISTIRME VE BILISIM HIZMETLERI A.S.	TR
48	SISSBV	SIEMENS INDUSTRY SOFTWARE AND SERVICES BV	NL
49	IMEC	Interuniversitair Micro-Electronica Centrum	BE
50	NOS	NOS Technology, S.A.	PT
51	TUBITAK	Turkiye Bilimsel Ve Teknolojik Arastirma Kurumu	TR
52	UPM	Universidad Politécnica de Madrid	ES
53	AIIM	AI in Motion	NL

2.2.2. International partners

The following table provides the list of international partners of ERTICO, supporting 5G/CCAM deployment and trials in China and Korea.

Short name	Full name	Country
CATT	China Academy of Telecommunications Technology	CN
CNHTC	Intelligent and Connected Vehicles Group, China National Heavy Duty Truck	CN
DALIAN	Dalian University of Technology	CN
DDET	DALIAN DAZZLEE TECNOLOGY CO. LTD.	CN
ETRI	ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE	KR
KATECH	KOREA AUTOMOTIVE TECHNOLOGY INSTITUTE	KR
QILUTIG	Qilu Transportation Information Group Co., Ltd.	CN
SHANDONG	Institute of Automation, Shandong Academy of Sciences	CN
SNET	S.NET ICT INC	KR

2.3. Project work plan

Work on the 5G-MOBIX project will be carried out over a three-and-a-quarter-year period (45 months) starting on 1 November 2018 (M1) and ending 31 July 2022 (M45) by the eight WPs as described in table 2 below.

Table 2: 5G-MOBIX work packages

WP	Work package name	Leader	Start	End
WP1	Project coordination	ERTICO	M1	M45
WP2	Specifications	AALTO	M1	M36
WP3	Development, integration and roll-out	WINGS	M4	M41
WP4	Trials	VEDECOM	M1	M41
WP5	Evaluation	ICCS	M1	M45
WP6	Deployment enablers	INTRA	M12	M45
WP7	Dissemination and exploitation	ERTICO	M1	M45

WP	Work package name	Leader	Start	End
WP8	Ethics requirements	ERTICO	M1	M45

WP2-WP5 are dedicated to development, testing and innovation activities, while WP1 and WP6-WP8 are overarching support activities. Figure 1 shows a flow chart based on the Project's planned workflow and the expected interaction and interdependencies of the work packages.

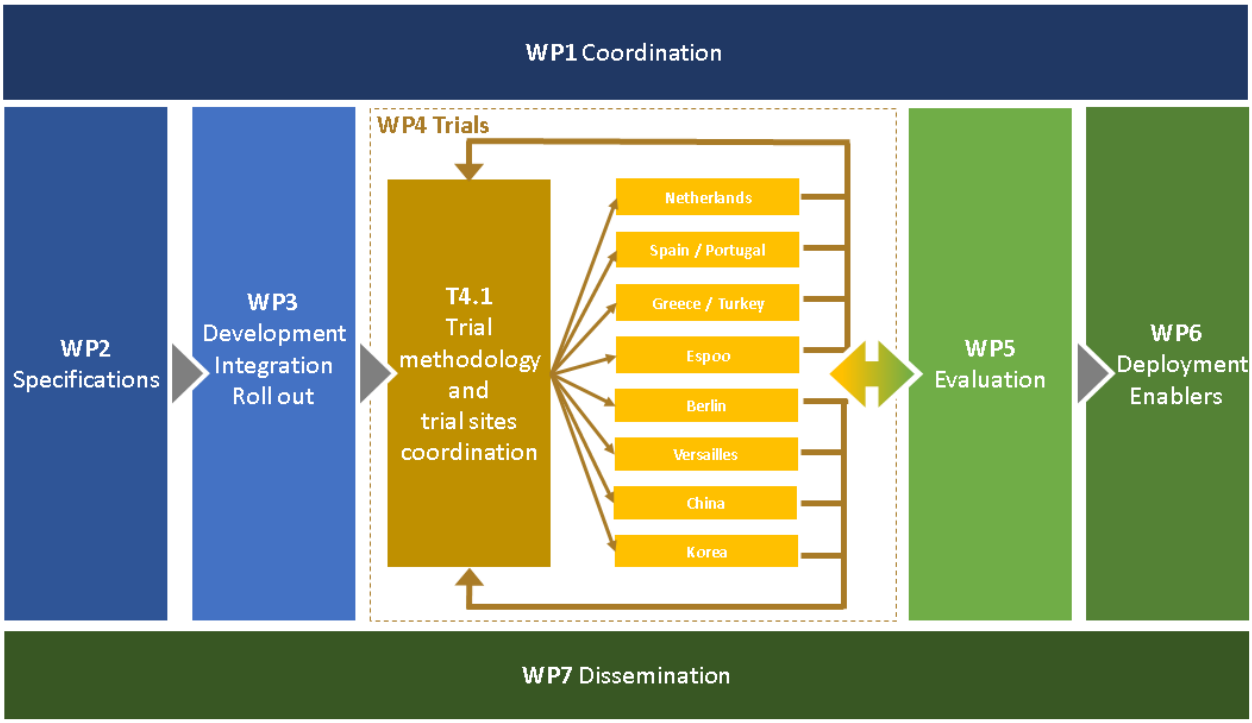

Figure 1: 5G-MOBIX workflow

All WPs are divided into Tasks, with each being responsible for delivering one or more deliverables referenced in the Description of Action (DoA) of the Grant Agreement. Each Task has a leader in charge of the overall coordination and completion of the Task. This task leader will work in close coordination with the Work Package Leader. Task Leaders will conduct the first level of quality control before the deliverables are submitted for internal Work Package review (see the *Quality Management Plan* – D1.2 for more details).

The trials in WP4 will take place at six Trial Sites (TS) as well as at two Cross-Border Corridors (CBCs) across Europe and Asia. Each TS and CBC represents a Task within WP4 as shown in table 3.

Table 3: 5G-MOBIX trial sites and cross-border corridors

#	Task	Country	Type	Leader
1	T4.2	Netherlands	TS	TNO
2	T4.3	Spain-Portugal	CBC	CTAG

#	Task	Country	Type	Leader
3	T4.4	Greece-Turkey	CBC	TURKCELL
4	T4.5	Finland	TS	AALTO
5	T4.6	Germany	TS	TU BERLIN
6	T4.7	France	TS	VEDECOM
7	T4.8	China	TS	DALIAN
8	T4.9	Korea	TS	KATECH

2.4. Gantt chart

5G-MOBIX's work plan is structured in multiple iteration cycles covering the specifications, development, trials and evaluation phases. This is to ensure that, at each stage of the Project, results are oriented towards the end-users, and that the maturity of the technological solutions and their adaptation to the market increases progressively. The choice of these cycles will be defined by each TS and CBC according to its specific situation and needs.

The Gantt chart in figure 2 reflects the iteration cycles with the overlap between WP2-WP5.

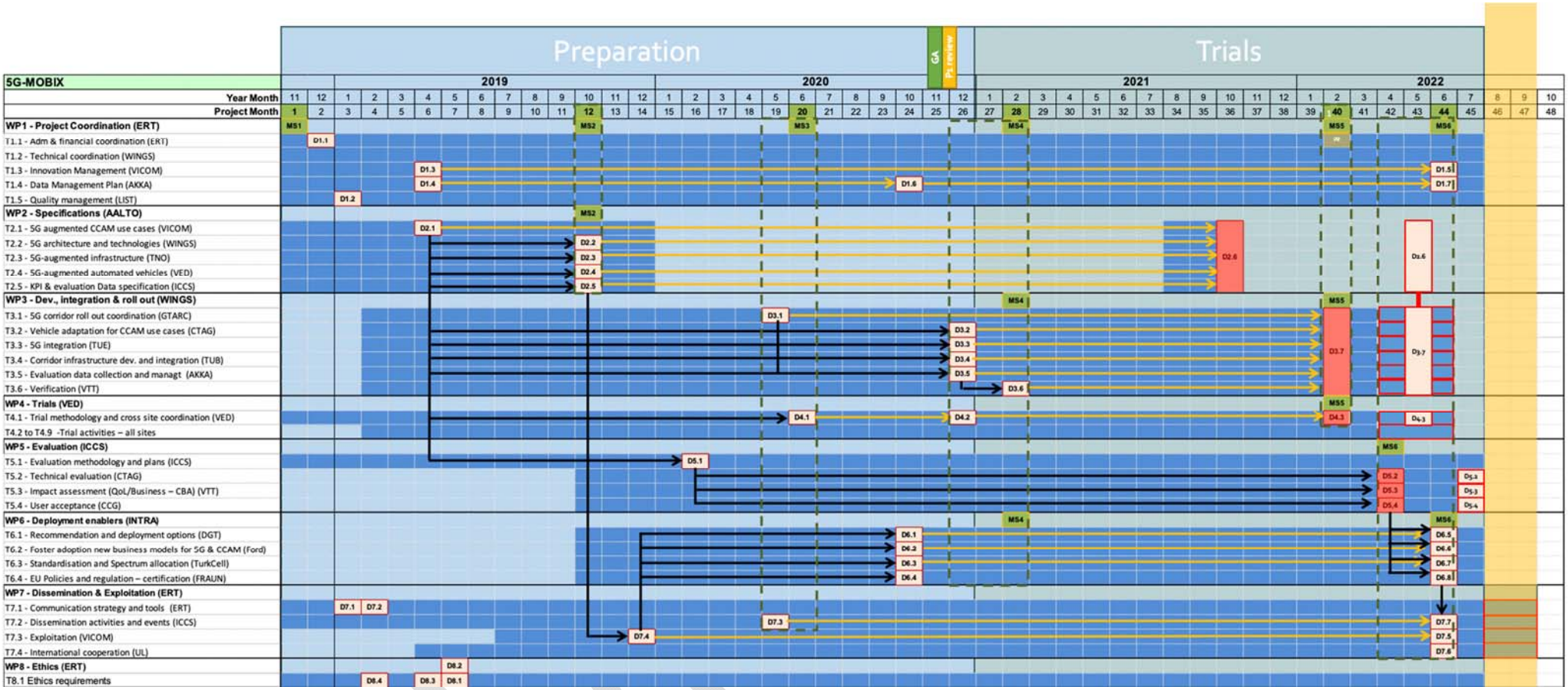
Preparation
Trials
GA
PL review
5G-MOBIX
2019
2020
2021
2022
Year Month
Project Month
WP1 - Project Coordination (ERT)
T1.1 - Adm & financial coordination (ERT)
T1.2 - Technical coordination (WINGS)
T1.3 - Innovation Management (VICOM)
T1.4 - Data Management Plan (AKKA)
T1.5 - Quality management (LIST)
WP2 - Specifications (AALTO)
T2.1 - 5G augmented CCAM use cases (VICOM)
T2.2 - 5G architecture and technologies (WINGS)
T2.3 - 5G-augmented infrastructure (TNO)
T2.4 - 5G-augmented automated vehicles (VED)
T2.5 - KPI & evaluation Data specification (ICCS)
WP3 - Dev., integration & roll out (WINGS)
T3.1 - 5G corridor roll out coordination (GTARC)
T3.2 - Vehicle adaptation for CCAM use cases (CTAG)
T3.3 - 5G integration (TUE)
T3.4 - Corridor infrastructure dev. and integration (TUB)
T3.5 - Evaluation data collection and managt (AKKA)
T3.6 - Verification (VTT)
WP4 - Trials (VED)
T4.1 - Trial methodology and cross site coordination (VED)
T4.2 to T4.9 -Trial activities – all sites
WP5 - Evaluation (ICCS)
T5.1 - Evaluation methodology and plans (ICCS)
T5.2 - Technical evaluation (CTAG)
T5.3 - Impact assessment (QoL/Business – CBA) (VTT)
T5.4 - User acceptance (CCG)
WP6 - Deployment enablers (INTRA)
T6.1 - Recommendation and deployment options (DGT)
T6.2 - Foster adoption new business models for 5G & CCAM (Ford)
T6.3 - Standardisation and Spectrum allocation (TurkCell)
T6.4 - EU Policies and regulation – certification (FRAUN)
WP7 - Dissemination & Exploitation (ERT)
T7.1 - Communication strategy and tools (ERT)
T7.2 - Dissemination activities and events (ICCS)
T7.3 - Exploitation (VICOM)
T7.4 - International cooperation (UL)
WP8 - Ethics (ERT)
T8.1 Ethics requirements

Figure 2: 5G-MOBIX Gantt chart[2]

[2] This GANTT shows the planning of the current in force amendment (Amendment#4 - AMD-825496-33). Some tasks have been agreed to be extended and some deliverables have been agreed to be postponed in the next amendment, based on feedback from the last review in ES-PT. This is visualized as well. The yellow band represents te target period for the final event. A complete overview of the deliverable dates is presented in Table 4.

2.5. Project deliverables

The below table lists the estimated delivery times of the deliverables as the current amendment (Amendment#4 - AMD-825496-33). Some deliverables have been agreed to be postponed in the next amendment, based on the feedback of the latest review in ES-PT. This has been incorporated in the dates below.

Table 4: List of Deliverables

Del Rel. No	Title	Lead Beneficiary	Nature	Dissemination Level	Est. Del. Date (annex I)
D1.1	Project management plan	ERT	Report	Public	31-Dec-18
D1.2	Quality management plan	LIST	Report	Public	26-Jan-19
D1.3	Innovation management plan	VICOM	Report	Public	25-Apr-19
D1.4	Initial data management plan	AKKA	ORDP	Public	30-Apr-19
D1.5	Innovation management report	VICOM	Report	Public	30-Jun-22
D1.6	Interim data management plan	AKKA	ORDP	Public	31-Oct-20
D1.7	Data management plan	AKKA	ORDP	Public	30-Jun-22
D2.1	5G-enabled CCAM use cases specifications	VICOM	Report	Public	30-Apr-19
D2.2	Specification of 5G network architecture & technologies	WINGS	Report	Public	31-Oct-19
D2.3	Specification of roadside infrastructure to support CCAM	TNO	Report	Public	31-Oct-19
D2.4	Specification of connected and automated vehicles	VED	Report	Public	31-Oct-19
D2.5	Initial evaluation KPIs and metrics	ICCS	Report	Public	31-Oct-19
~~**D2.6**~~	~~Final set of 5G/CCAM systems and vehicle specifications~~	~~AALTO~~	~~Report~~	~~Public~~	~~29-Oct-21~~ 31-May-22 Combined with D3.7

D3.1	Corridor and trial sites roll-out plan	GT-ARC	Report	Public	30-Nov-19
D3.2	Report vehicle development and adaptation for 5G enabled CCAM use cases	CTAG	Report	Public	31-Jan-21
D3.3	Report on the 5G technologies integration and roll-out	TU/e	Report	Public	31-Jan-21
D3.4	Report on corridor infrastructure development and integration	TUB	Report	Public	31-Jan-21
D3.5	Report on the evaluation data management methodology and tools	AKKA	Report	Public	31-Jan-21
D3.6	Report on trial readiness verifications	VTT	Report	Public	30-Apr-21
D3.7	Final report about development, integration and roll out	GT-ARC	Report	Public	~~28-Feb-22~~ 31-May-22
D4.1	Report on the corridor and trial site plans	VED	Report	Public	30-Nov-19
D4.2	Report on the methodology and pilot site protocol	VED	Report	Public	26-Feb-21
D4.3	Report on the corridor and trial site test activities	VED	Report	Public	~~28-Feb-22~~ 31-May-22
D5.1	Evaluation methodology and plan	ICCS	Report	Public	29-Feb-20
D5.2	Report on technical evaluation	CTAG	Report	Public	~~30-Apr-22~~ 31-Jul-22
D5.3	Report on impact assessment and cost-benefit analysis	VTT	Report	Public	~~30-Apr-22~~ 31-Jul-22
D5.4	Report on user acceptance	CCG	Report	Public	~~30-Apr-22~~ 31-Jul-22
D6.1	Plan and preliminary report on the deployment options	DGT	Report	Public	31-Oct-20

	for 5G technologies for CCAM				
D6.2	Plan and preliminary report on the business models for cross border 5G deployment enabling CCAM	FORD	Report	Public	31-Oct-20
D6.3	Plan and preliminary report on the standardisation and spectrum allocation needs	TURKCELL	Report	Public	31-Oct-20
D6.4	Plan and preliminary report on EU policies and regulations recommendations	FRAUNHOFER	Report	Public	31-Oct-20
D6.5	Final report on the deployment options for 5G technologies for CCAM	DGT	Report	Public	30-Jun-22
D6.6	Final report on the business models for cross border 5G deployment enabling CCAM	FORD	Report	Public	30-Jun-22
D6.7	Final report on the standardisation and spectrum allocation needs	TURKCELL	Report	Public	30-Jun-22
D6.8	Final report on EU policies and regulations recommendations	FRAUNHOFER	Report	Public	30-Jun-22
D7.1	Communication strategy and plan	ERT	Report	Public	31-Jan-19
D7.2	Project communication identity and website	ERT	Websites, patents filling, etc.	Public	28-Feb-19
D7.3	Dissemination plan	ICCS	Report	Public	31-Mar-19
D7.4	Initial exploitation strategy and plan	VICOM	Report	Confidential	31-Dec-19
D7.5	Report on the exploitation results	VICOM	Report	Confidential	30-Jun-22
D7.6	Report on the international cooperation results	UL	Report	Public	30-Jun-22

D7.7	Report on the dissemination activities	ICCS	Report	Public	30-Jun-22
D8.1	H - Requirement No. 1	ERT	Ethics	Confidential	31-May-19
D8.2	POPD - Requirement No. 2	ERT	Ethics	Confidential	31-May-19
D8.3	M - Requirement No. 3	ERT	Ethics	Confidential	30-Apr-19
D8.4	NEC - Requirement No. 4	ERT	Ethics	Confidential	28-Feb-19

2.6. Key Milestones

Table 5: List of Key Milestones

Milestone number	Milestone title	WP number	Lead beneficiary	Due Date (in months)	Means of verification
MS1	Project kick-off	WP1	1 – ERT	1	Kick-off Meeting of the project Means of verification: Minutes of the kick-off meeting
MS2	Specifications completed	WP2	2 – AALTO	12	All the specification for the 5G architecture and technologies for CCAM specifications for the use cases will be completed. Means of verification: D2.1 to D2.5 available
MS3	Roll-out plan, evaluation methodology and plan, dissemination and exploitation plan ready	WP3, WP5, WP7	45 – WINGS	16	Roll-out plan, evaluation methodology and plan, dissemination and exploitation plan ready Means of verification: D3.1, D5.1 and D7.1 to D7.4 available
MS4	Roll-out completed, pilot site protocol, deployment	WP3, WP4, WP6	23 – INTRA	28	Roll-out completed, pilot site protocol, deployment enablers plan ready Means of verification: D3.2 to D3.5, D4.2 and D6.1

	enablers plan ready				
MS5	Revised specifications and roll-out reports, end of trials	WP2, WP3, WP4	41 – VED	~~40~~ 43	Revised specifications and roll-out reports, end of trials Means of verification: D2.6, D3.7 and D4.3
MS6	Evaluation, deployment enablers and dissemination & exploitation actions completed and final event	WP1, WP2, WP3, WP4, WP5, WP6, WP7, WP8	1 – ERT	44	Evaluation, deployment enablers and dissemination & exploitation actions completed and final event Means of verification: Final event report, D5.2 to D5.4, D6.2 to D6.8, D7.5 to D7.7

3. PROJECT MANAGEMENT

3.1. Management structure and functions

3.1.1. Project Management overview

Within a large project such as 5G-MOBIX, the distribution of responsibilities and the flow of information are of particular importance for creating the control, transparency and trust necessary for close collaboration between all partners. 5G-MOBIX has put in place a cohesive management structure to address the challenge of coordinating a project of this size with partners working in many different locations to deliver and evaluate global results representing a diversity of countries. 5G-MOBIX's management structure has been defined to:

- Ensure seamless and straightforward coordination of the consortium while fulfilling the EC contractual obligations by means of an experienced and talented coordination team supporting the daily tasks of the ***Project Coordinator (PC)***
- Ease communication and coordination at the thematic and regional levels by combining work package and trial site coordination in the ***Project Management Team (PMT)***
- Secure the alignment of the project activities with the industry and the EU political agenda with the help of an ***External Advisory Board (EAB)***
- Position the ***PMT managers*** (e.g. Data Manager) to act as (***Task/WP***) ***Leader*** within the core task related to their responsibilities

The illustration in figure 3 represents the 5G-MOBIX organisational and management structure, which will be detailed in the sections that follow.

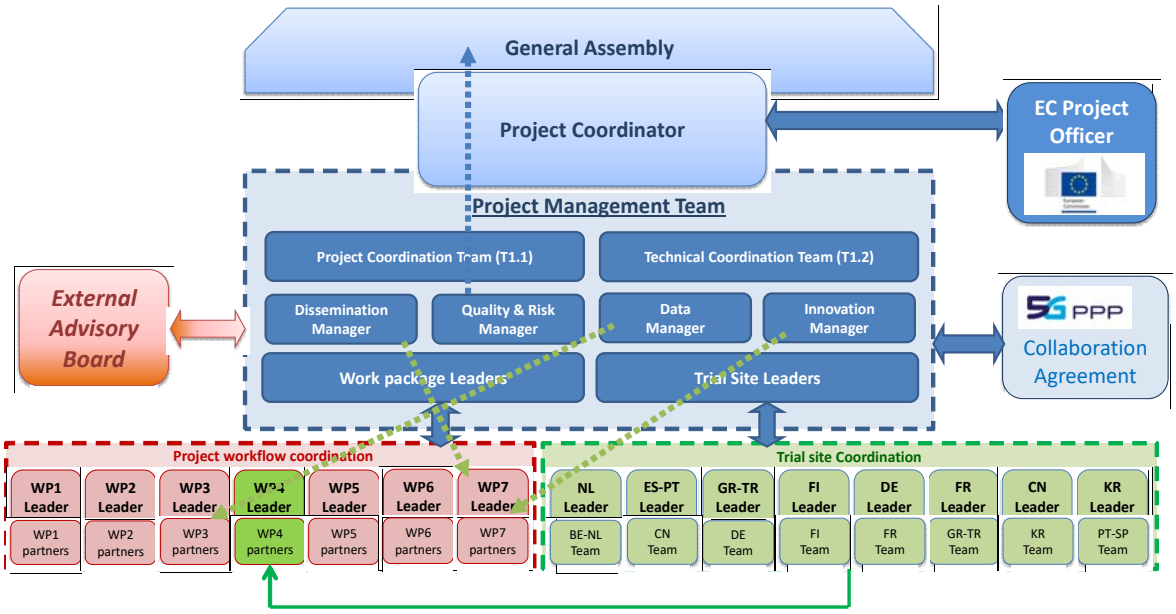

Figure 3: 5G-MOBIX organizational and management structure

The management structure described in the figure 3 above shows that the ***Project Management Team*** is the central body steering 5G-MOBIX. The foundations of the ***PMT*** are the two middle coordination layer of the project:

- ***The Work Package Leaders (WPLs)***
- ***The Trial Site Leaders (TSLs)***

Four managers are responsible for the cross work package and cross trial site coordination of horizontal issues being: ***Dissemination management***, ***Quality & Risk management***, ***Data management*** and ***Innovation management***. These managers have been assigned key tasks within the project as has been depicted with the dotted green lines. The Quality & Risk Manager has an additional right to approach the General Assembly directly in case of risks related to project management itself.

At the top level of the ***PMT*** are the ***PC*** and the ***Technical Coordination Team (TMT)*** both monitoring the progress of all WPs, Trial Sites and Managers and leading the PMT meeting agendas and discussions as well as deciding about the solution to solve issues. The ***TMT*** is chaired by the ***Technical Coordinator (TC)***.

Around the ***PMT***, entities are supporting the success of the 5G-MOBIX project coordination:

1. The ***External Advisory Board (EAB)***, supporting the alignment of the project with the current research, societal and industry needs, this body has representatives from different stakeholder categories
2. 5G-MOBIX liaise with ***5G-PPP*** to exchange information and coordinate the impact of all ongoing 5G projects

The ***General Assembly*** is the unique body where all project beneficiaries are represented and thus can vote all decisions either relating to changes in the project plans or decision submitted by the ***PMT***, in case of a lack of consensus.

The ***PC*** chairs the meetings of the ***PMT*** and the ***General Assembly*** and is the unique point of contact with the ***European Commission (EC)*** (or Funding Authority).

The management functions within 5G-MOBIX will be performed at two levels:

1. The **operational level**: The ***PC***, the ***TC***, and the ***PMT*** carry out the day-to-day project management responsibilities – the planning, steering, and controlling of the work progress from work packages and trial sites, as well as the overall quality of results and the management of risks.
2. The **strategic level**: The ***General Assembly*** approves the ***PC*** and ***PMT*** decisions and, if necessary, changes of project plans or consortium. The ***EAB*** provides non-binding recommendations and counsel on project functions and activities.

The following sections present in detail the different bodies.

3.1.2. Operational bodies

3.1.2.1. Project Coordinator (PC - ERTICO)

The Project Coordinator for 5G-MOBIX is ERTICO, represented by the primary Coordinator Contact, Mr. Coen Bresser, Senior Manager for Innovation and Deployment in the field of Connected and Automated Driving. The PC is responsible for the successful and smooth running of the entire project and shall coordinate the project according to EC rules and the terms of the Grant Agreement and the Consortium Agreement of the H2020 Programme.

The PC serves as the sole, legitimate intermediary between the 5G-MOBIX Consortium and the European Commission (EC). He is responsible for monitoring the Project's progress, providing periodic reports to the Commission, and organising technical reviews. Some specific activities that ERTICO will carry out concerning the EC are to:

- Inform the Commission about events likely to significantly affect or delay the implementation of the action or the EU's financial interests, and inform the Commission of circumstances affecting the decision to award the Grant or the compliance with requirements under the Agreement
- Submit deliverables and reports (periodic and final) to the Commission
- Coordinate reviews of the European Commission to the project
- Receive EU funding payments from the Commission and distribute them to the beneficiaries
- Collect, review, and verify consistency before submitting reports, other deliverables (including financial statements and related certifications) and specific requested documents to the EC

In compliance with the Consortium Agreement, the PC is also responsible for keeping the address list of 5G-MOBIX partner beneficiaries and other contact persons updated and available. He shall organise and chair

all meetings of the strategic management bodies described in section 3.1.3, and is responsible for the preparation, distribution and recording of the meeting documentation such as agendas and minutes.

The Project Coordination Team will support the PMT with organizational, administrative, financial and legal issues.

3.1.2.2. Technical Coordinator (TC - WINGS)

Given the scale and importance of the Project, 5G-MOBIX has designated the leader of Task T1.2 – *Technical Coordination* – as the Technical Coordinator (TC) of the Project. This role has been assigned to Mr. Kostas Trichias of WINGS. In keeping with T1.2 responsibilities, the TC will play a crucial and active role in the overall coordination of the technical activities, including monitoring of their compliance with the Grant Agreement, Project advancement and use of resources. The TC has a close cooperation with quality management. The Technical Coordinator carries out the technical coordination with the support of the Technical Coordination task partners, which includes the Project Coordinator. Beyond the Project Coordinator and the Technical Coordinator, the five following experts were nominated to join the task T1.2, with a corresponding domain of expertise:

- Geerd Kakes, KPN - 5G Networks & Chipsets
- Joao Almeida, IT - Vehicles OBU & infrastructure RSU
- Emanuel Sousa, CCG - Application and User stories
- Luis Bernal, UMU - Security and Privacy
- Dinos Katsaros, ICCS - E2E Assessment

Specifically, the TC will:

- Monitor the activities of all WPs and Corridors & Trial Sites with regular teleconferences
- Monitor and guarantee timely execution of all Project tasks against the Project Gantt chart
- Especially monitor the deployment plans at the Cross Border and local sites, raised issues during the PMT calls and proposes solution to solve the issues
- Monitor the Local Test Site plans to ensure they contribute timely to the 2 Cross Border sites objectives
- Generate close working cooperation between the WP and Corridor & Trial Sites Leaders – refine and refocus any activity as necessary
- In collaboration with the Task T1.1, organise and convene regular PMT meetings for productive interaction between all the leaders
- Monitor and control the production of the content of the deliverables from a technical results and consistency point of view

3.1.2.3. Project Management Team (PMT)

The PMT is the unique operational and central steering body of the project.

The PMT is collectively responsible for the operational management of the Project. It will act as the main consensus-building body on overall Project Coordination and as such provides a link between the WPLs and the General Assembly.

Through regular meetings and via bi-weekly management team teleconferences (telcos), the PMT will monitor risks and identify problems & delays early. This enables the PMT to proactively prevent conflict situations and anticipate deviations from the Project plan. In addition to the bi-weekly online meetings, the PMT will also meet physically at least once every six months, provided there are no restrictions in relation to the COVID-19 pandemic.

Beyond the Project Coordinator team and the Technical Coordinator team, the following bodies are part of the PMT:

- The ***Work Package Leaders (WPLs)***, who are responsible for the executive management of the individual work packages. The WPLs are supported by the Task Leaders who report to the WPL on a regular basis. For all technical coordination, the WPLs report to the Technical Coordinator and the rest of the PMT. For progress reporting and the periodic reports, the WPLs report directly to the Coordinator.
- The ***Corridor*** and ***Trial Site Leaders***, who are the interface between the Project and the local-site teams. They are responsible for the close linkage of 5G-MOBIX activities to the local Corridor and Trial Sites. The harmonization of time plans, test scenarios, data management and the continual information about evaluation methods and impact assessment are the major tasks of the team. The leaders are responsible for ensuring proper application of the Data Protection policies at the national level. The Corridor and Trial Site leaders are the corresponding task leaders in WP4.
- The ***Innovation Manager*** (VICOMTECH), who leads the Innovation Management Task (T1.3) to ensure that the project coordination develops favourable conditions for innovation and takes necessary actions to make certain that the innovations will be effectively exploited after the end of 5G-MOBIX. The Innovation Manager leads the Exploitation task (T7.3). This maximizes the ability to execute his/her responsibilities as Innovation Manager.
- The ***Data Manager*** (AKKA), who leads the Data Management Plan Task (T1.4) and will ensure project coordination in terms of the collection, storage and handling of evaluation data, as well as their publication as part of the Open Research Data Pilot (ORDP). He/she will raise potential issues and propose solutions for dealing adequately with data privacy and data protection regulations. The Data Manager is active in WP3 with delivering the Central Test Server (CTS). This maximizes the ability to execute his/her responsibilities as Data Manager.
- The ***Quality & Risk Manager*** (LIST), who leads the Quality Management Task (T1.5) thus ensuring high quality of deliverables and outcomes of the overall Project targets. He/she also supports project coordination in achieving the milestones by monitoring the production of deliverables and by executing the risk management process as described in section 3.3. The Quality & Risk Manager has the authority to approach the General Assembly directly to ensure that risks related to the PMT and coordinator can and will be discussed at the highest body for decisions.
- The ***Communication Manager*** (ERTICO), who leads the Dissemination & Exploitation WP (WP7) and Communication Strategy & Tools Task (T7.1) to ensure that the project is well coordinated for achieving excellent outreach with public events, scientific publications and presentations.

The current Members of the PMT are as described in the following table 6.

Table 6: 5G-MOBIX Project Management Team

Role	Beneficiary	Leader
WP leaders		
WP1 – Project Coordination	ERTICO	Coen BRESSER ***(Project Coordinator)***
WP2 – Specifications	AALTO	Edward MUTAFUNGWA
WP3 – Development - roll out	WINGS	Kostas TRICHIAS
WP4 – Trials	VEDECOM	Camille PLESTAN
WP5 – Evaluation	ICCS	Konstantinos KATSAROS
WP6 – Deployment enablers	INTRASOFT	Olga SEGOU
WP7 – Dissemination	ERTICO	Julie CASTERMANS
WP8 – Ethics	ERTICO	Rita BHANDARI
Managers		
Technical Coordinator	WINGS	Kostas TRICHIAS
Communication Manager	ERTICO	Julie CASTERMANS
Innovation Manager	VICOMTECH	Mónica DÍAZ DE MENDEVIL (deputy Seán GAINES)
Data Manager	AKKA	Sadeq ZOUGARI
Quality Manager	LIST	Marie Laure WATRINET (deputy Céline DECOSSE)
Trial site leaders		
Netherlands	TNO	Sven JANSEN
Spain	CTAG	Irene SACO
Portugal	CCG	Emanuel SOUSA
Greece	COSMOTE	Fofy SETAKI
Turkey	TURKCELL	Evren TUNA
Finland	AALTO	Edward MUTAFUNGWA
Germany	TU BERLIN	Sebastian PETERS
France	VEDECOM	Oyunchimeg SHAGDAR
China	DALIAN	Yanqiang LI
Korea	ETRI	Heesang CHUNG

Then main roles of the Project Management Team are as follows:

- Communicate regularly to monitor WP and trial site progress and to discuss potential issues
- Hold regular Teleconferences, at least every 2 weeks, as well as physical meetings, to:
  - Assess the status and progress of all the Project activities and results
  - Discuss issues and try to reach a consensus about the decisions for finding solutions and adapting the project plan as necessary
  - Assess the needs for changing the allocation of resources
  - Monitor the risks in the risk register and potential mitigation measures in place, and identify new risks
  - Discuss about the dates of the General Assembly and prepare the agenda and the presentations
  - Prepare the review meeting with the European Commission as well as the presentations
  - Prepare the meetings with the External Advisory Board
  - Discuss feedback from the European Commission or the External Advisory Board and propose corrective actions
  - Support the dissemination activities and in particular the preparation of events and demonstration
- Members of the PMT will attend the important coordination meetings of the project, particularly the official review meetings with the European Commission
- As necessary, the PMT may create and instruct task forces, particularly to efficiently solve cross work-package issues
- Act as intermediary in cases of conflicts that cannot be resolved at WP level
- Support the Project and Technical Coordinators with the necessary updates of the project plan and the GA amendment
- Assess and approve calls for extraordinary General Assembly meetings (beyond the required annual meetings)

3.1.3. Strategic bodies

In addition to the PMT, 5G-MOBIX will rely on two other strategic bodies that will perform a complementary role to guarantee transparency, accountability and expert topical knowledge.

3.1.3.1. General Assembly (GA)

The General Assembly is the highest decision-making body of 5G-MOBIX where all partners of the Consortium are represented. Upon recommendations from the Project Management Team, the Risk Manager and/or the Coordinator, the GA takes final decisions on the overall policy of the Consortium, on proposals for modifications or extensions of the Grant Agreement or of the objectives of the project. Decisions are reached by a GA vote of two-thirds of the membership voting in favour. The quorum for a legitimate vote is also set at two-thirds of the partners being present. The Project Coordinator chairs the

GA, which meets at least once a year physically if allowed by COVID-19 pandemic restrictions. Attendance at the GA is mandatory and requires at least one representative of each beneficiary to be present at the meetings.

3.1.3.2. External Advisory Board (AB)

The Advisory Board will act as external reviewer and offer non-binding advice and recommendations to the project. The purpose of the Advisory Board is to:

- Assist in aligning the Project with market and stakeholder needs and is developing according to industry standards
- Assist and facilitate the project coordination by providing assessments and recommendations about the project execution
- Assist and advise on the alignment of cross-border issues with the market needs
- Assist and advise on any project strategic decisions

Project coordination involves the Advisory Board in key strategic decisions and ways forward, for example when project (result) redefinitions or restructurings are necessary.

The AB will be open to other stakeholders from the global telecommunications and mobility community. Table 7 shows the current 5G-MOBIX Advisory Board, which includes public authorities and regulation authorities, vehicle manufacturers, telecom industry stakeholders and research organisations involved in the development of 5G deployment scenarios for automated mobility. The added value of the AB will be to offer insights from different links of the value chain, especially to support WP6 with the development of the deployment scenarios.

The Advisory Board will have access to the Project deliverables (with confidentiality agreements in place) and be available to answer specific questions from Consortium members on their specialty topics.

Table 7: 5G-MOBIX Advisory Board

Domain	Organisation	Name
City administration	City of Berlin	Bernd Lietzau
Government	Finnish Transport Safety Agency (TRAFICOM)	Eetu Pilli-Sihvola + (Tero Aulanko)
Government	GR Ministry of digital policy and telecommunication and media (YME)	Nadia Katsanou
Vehicle manufacturer	Renault Samsung Motors (RSM)	Young Su Kim
Research	AutomotiveNL (ANL)	Bram Hendrix
Government	Hellenic Ministry of Infrastructure and Transport (HMIT)	Konstantinos Papadimitriou

Government	The Information and Communication Technologies Authority (ICTA) of Turkey (BTK)	Ramazan Yılmaz Fethiye Çuhadaroğlu
Cross-industry organisation	5G Automotive Association (5GAA)	Maxime Flament
IT-industry suppliers	Qualcomm	Ralf Weber
Research	University of Zilina in intelligent Transport Systems (ERAdiate)	Tatiana Kovacikova

All newly recruited AB members must be approved by the GA and may be asked to sign a non-disclosure agreement (NDA). A travel budget will be managed by ERTICO to cover the members' travel costs to participate in Advisory Board meetings. At least three meetings will be convened with AB and representatives of the 5G-MOBIX Consortium as well as one mid-term demo and the final event.

Currently, the Advisory Board has convened in the following meetings:

- October 2019, Introduction to the project
- November 2020, Getting the message right, joint General Assembly meeting
- January 2022 Validation of restructuring after the ES-PT review

They will be invited for the public demonstrations in the GR-TR and ES-PT corridors.

3.2. Management processes and procedures

5G-MOBIX's Project Management Plan puts in place certain project-management processes and procedures to ensure that the workflow is smooth and that the Project delivers high-quality output and an outcome within the defined scope and time. These processes and procedures are intended to facilitate risk and quality management and to ensure that the innovation and deployment objectives of the Project are attained.

3.2.1. 5G-MOBIX administrative management processes

Three processes contribute to the efficient and dynamic management of the project: Progress reporting and evaluation of results; Planning and implementation of changes; Project administration and contract management; Project management tools and services.

3.2.1.1. Project administration and contract management

The conditions and procedures for a Grant Agreement amendment are set in Article 55 of the Grant Agreement. Requests for amendments to the Grant Agreement and significant Project changes and deviations must be submitted in writing to the Project Coordinator. The Project beneficiary or Work Package Leader requesting the change must indicate to the Coordinator the reasons for the proposed amendment and its consequences in terms of budget, work programme, etc. The Coordinator must be informed as soon

as a potential need for amendment to the Grant Agreement or a change to the Project plan is identified. Examples of subjects for contract amendment include (list not exhaustive):

- Partners joining or leaving the Project
- Re-allocation of budget
- Incorporation of requirements from the EC
- Extension of contract duration
- Modification of Description of Action (Annex 1 to the Grant Agreement, Milestones, Deliverables submission date, Partner tasks, etc.)

The amendment request must be approved by a General Assembly vote. It will then be forwarded by the Project Coordinator to the EC on behalf of the Consortium.

The Coordinator is responsible for updating the amendments in the Participant Portal.

3.2.1.2. Planning and implementation of changes

The Project Coordinator must be informed in writing of any request for change to the DoA of the Grant Agreement. The communication must include the following information:

- The proposed change
- Whether status of the contract must be changed
- Justifications for the change
- Impact of the changes on the project plan

Minor changes such as slight adjustments or internal shift of resources will be dealt with in the periodic reporting and do not require a Grant Agreement amendment. Such changes, however, must always be indicated to the PC and have the approval of the WP Leader involved.

3.2.1.3. Progress reporting and evaluation of results

5G-MOBIX is bound by the Grant Agreement to provide periodic reports on its progress towards the Project objectives. A Periodic Technical Report reflecting the progress until M18 and a Final Report for the end of the Project in M45 must be provided to the European Commission. To complement these reports, 5G-MOBIX will produce seven Internal Reports.

3.2.1.3.1. Internal Reports

These reports entitled *Project Coordination Internal Reports* (numbered IR1.1 - IR1.7) will be produced around every six months[3] (M08, M14, M20, M25, M32, M38, M47) to provide the status of each WP in terms of:

- Objectives of the period

[3] The exact periods are dependent on the moments of the official reports to ensure that an internal report overlaps with an official (interim/final) report.

- Progress towards objectives in this period, including milestones and deliverables
- Justification and impact of delays and objectives not achieved
- The situation regarding personnel and other costs
- Any changes or deviations in the use of project resources or organisation

The Internal Reports will be used to detect any need for corrective action and will also be the basis for preparing the EC periodic reports. A risk register will be presented to the European Commission as part of the periodic reporting process. Recommendations arising from project periodic reviews will also be added as items to be addressed in the following reporting period.

Work Package Leaders will be responsible for compiling the reports on work done by collecting status reports from their Task Leaders. When the timing overlaps with the official periodic report, the official report will serve as internal report as well.

Recommendations arising from project periodic reviews will also be added to be addressed in the following reporting period.

Currently, the following internal reports are available:

Table 8: List of internal and periodical project reports

ID	Months	SharePoint location
IR1.1	M01-M06	Folder
IR1.2	M01-M12	5G-MOBIX - IR1.2 - M01-M012 internal report.docx
IR1.3	M01-M18	5G-MOBIX - IR1.3 - M01-M018 internal report_ALL-final.pdf
IR1.4 / P1	M01-M23	5G-MOBIX - P1 report M01-M23 - Part B - v1.5.pdf
IR1.5	M24-M30	5G-MOBIX - IR1.5 - M24-M30 - Part B - final.pdf
IR1.6	M31-M36	5G-MOBIX - IR1.6 - M31-M36 - Part B final.pdf

3.2.1.3.2. Interim and final periodic reports for the EC

Article 20 of the Grant Agreement obliges the Coordinator to submit technical and financial reports to the EC. As with the Internal Reports, WP Leaders will work closely with Task Leaders to produce complete records of their activities and achievements towards objectives as well as the contribution of all the partners involved, as required by the Grant Agreement. These reports will also serve to justify Person Month (PM) costs reported by the beneficiaries. The reports will be sent to the Coordinator for submission to the EC.

The relevant text of Article 20 is reproduced below and will be the basis of 5G-MOBIX's reporting management plan. Below text *cannot* be used as substitute for the official text in the Grant Agreement and is for information purpose only.

ARTICLE 20 — REPORTING — PAYMENT REQUESTS

20.1 Obligation to submit reports

The coordinator must submit to the Commission (see Article 52) the technical and financial reports set out in this Article. These reports include requests for payment and must be drawn up using the forms and templates provided in the electronic exchange system (see Article 52).

20.2 Reporting periods

*The action is divided into the following '**reporting periods**':*

- RP1: from month 1 to month 23

- RP2: from month 24 to month 45

20.3 Periodic reports — Requests for interim payments

The coordinator must submit a periodic report within 60 days following the end of each reporting period.

*The **periodic report** must include the following:*

*(a) a '**periodic technical report**' containing:*

*(i) an **explanation of the work carried out** by the beneficiaries;*

*(ii) an **overview of the progress** towards the objectives of the action, including milestones and deliverables identified in Annex 1.*

This report must include explanations justifying the differences between work expected to be carried out in accordance with Annex 1 and that actually carried out.

*The report must detail the exploitation and dissemination of the results and — if required in Annex 1 — an updated '**plan for the exploitation and dissemination of the results**'.*

The report must indicate the communication activities;

*(iii) a **summary** for publication by the Commission;*

*(iv) the answers to the '**questionnaire**', covering issues related to the action implementation and the economic and societal impact, notably in the context of the Horizon 2020 key performance indicators and the Horizon 2020 monitoring requirements;*

*(b) a '**periodic financial report**' containing:*

*(i) an '**individual financial statement**' (see Annex 4) from each beneficiary and from each linked third party, for the reporting period concerned.*

The individual financial statement must detail the eligible costs (actual costs, unit costs and flat-rate costs; see Article 6) for each budget category (see Annex 2).

The beneficiaries and linked third parties must declare all eligible costs, even if — for actual costs, unit costs and flat-rate costs — they exceed the amounts indicated in the estimated budget (see Annex 2). Amounts which are not declared in the individual financial statement will not be taken into account by the Commission.

If an individual financial statement is not submitted for a reporting period, it may be included in the periodic financial report for the next reporting period.

*The individual financial statements of the last reporting period must also detail the **receipts of the action** (see Article 5.3.3).*

*Each beneficiary and each linked third party must **certify** that:*

- the information provided is full, reliable and true;

- the costs declared are eligible (see Article 6);

- the costs can be substantiated by adequate records and supporting documentation (see Article 18) that will be produced upon request (see Article 17) or in the context of checks, reviews, audits and investigations (see Article 22), and

- for the last reporting period: that all the receipts have been declared (see Article 5.3.3);

*(ii) an **explanation of the use of resources** and the information on subcontracting (see Article 13) and in-kind contributions provided by third parties (see Articles 11 and 12) from each beneficiary and from each linked third party, for the reporting period concerned;*

(iii) not applicable;

*(iv) a '**periodic summary financial statement**', created automatically by the electronic exchange system, consolidating the individual financial statements for the reporting period concerned and including — except for the last reporting period — the **request for interim payment**.*

20.4 Final report — Request for payment of the balance

In addition to the periodic report for the last reporting period, the coordinator must submit the final report within 60 days following the end of the last reporting period.

*The **final report** must include the following:*

*(a) a '**final technical report**' with a **summary** for publication containing:*

(i) an overview of the results and their exploitation and dissemination;

(ii) the conclusions on the action, and

(iii) the socio-economic impact of the action;

*(b) a '**final financial report**' containing:*

*(i) a '**final summary financial statement**', created automatically by the electronic exchange system, consolidating the individual financial statements for all reporting periods and including the **request for payment of the balance** and*

*(ii) a '**certificate on the financial statements**' (drawn up in accordance with Annex 5) for each beneficiary and for each linked third party, if it requests a total contribution of EUR 325 000 or more, as reimbursement of actual costs and unit costs calculated on the basis of its usual cost accounting practices (see Article 5.2 and Article 6.2).*

20.5 Information on cumulative expenditure incurred

Not applicable

20.6 Currency for financial statements and conversion into euro

Financial statements must be drafted in euro.

Beneficiaries and linked third parties with accounting established in a currency other than the euro must convert the costs recorded in their accounts into euro, at the average of the daily exchange rates published in the C series of the Official Journal of the European Union, calculated over the corresponding reporting period.

If no daily euro exchange rate is published in the Official Journal of the European Union for the currency in question, they must be converted at the average of the monthly accounting rates published on the Commission's website, calculated over the corresponding reporting period.

Beneficiaries and linked third parties with accounting established in euro must convert costs incurred in another currency into euro according to their usual accounting practices.

20.7 Language of reports

All reports (technical and financial reports, including financial statements) must be submitted in the language of the Agreement.

3.2.2. 5G-MOBIX management procedures

5G-MOBIX has defined a set of procedures to support the coordination tasks and to ensure the above processes are run efficiently. These procedures relate primarily to conflict resolution, resource management, and quality and risk assurance.

3.2.2.1. Conflict resolution

Consensus will be pursued as the general principle in the decision-making processes of 5G-MOBIX. Decisions in the Project will generally be taken at the lowest organisational level possible, i.e. starting with the Task Leaders. The PMT will be the preferred entity to solve most of the issues in a consensus-based manner. If the conflict remains unresolved at the PMT level, the General Assembly will be consulted and will vote a decision for resolving the issue.

3.2.2.2. Procedure for resource reporting and management

Project resources are managed by the Coordinator based on the Grant Agreement. 5G-MOBIX will provide the periodic reports required by the European Commission and also generate an internal report every six months about the progress of the work, the achievements, the risks as well as an overview of the resources spent. These internal reports (IR1.1 to IR1.7) will help in monitoring and controlling the Project and will be the basis for the provision of the EC periodic reports. They will also help in mitigating performance issues from participants or anticipating the need for updating the Project Plan, including the reorganisation of resources.

The internal reporting procedure will be based on the official periodic reporting requirements and include input from all Project beneficiaries. These reports will comprise two parts:

Part A will contain resource management reports for the period.

Part B will describe the work done during that period.

1. Towards the end of the reporting period (M01-M06, M07-M12, etc.), the Coordinator, ERTICO, will send out a request to all partners to provide input in the dedicated templates

2. For Part A, each beneficiary partner will report their resource use for the period based on a per task estimation of expected resource use; a summary of the activities performed will be provided along with justification for deviations
3. For Part B, WP Leaders will collect input from Task Leaders and other beneficiaries and report the progress made in the provided template. The contribution of all beneficiaries involved in the WP will be briefly summarised
4. The Coordinator will use this report to ensure that Project activities are on course and all beneficiaries are contributing as expected
5. Corrective action may include shifting resources (Person Months) from non-performing partners

3.2.2.3. Project meetings procedures

The procedures for organising meetings are part of section 6.2 – *General operational procedures for all Consortium Bodies* – of the 5G-MOBIX Consortium Agreement. It is essential to follow these procedures closely to ensure the validity of all decisions and actions of the Consortium.

3.2.2.3.1. Convening meetings

5G-MOBIX meetings will be convened at various representation levels from a GA to Task and WP level.

In order to create synergies, cooperate and organize activities, periodic meetings will be scheduled at the Tasks and Work Package levels. The frequency and timing of these meetings is set by the Task and WP Leaders as needed by their activities.

Management meetings will be held periodically to review the overall status of the Project. Such meetings are meant to ensure that the Project is on the right track and that the pace of work is on schedule. Table 9 lists the types of meetings and their frequency:

Table 9: 5G-MOBIX management meetings

Body	Ordinary meeting	Extraordinary meeting
General Assembly	At least once a year	At any time upon written request of the ***Project Management Team*** or 1/3 of the Members of the General Assembly
Project Management Team	At least every three months, preferably bi-weekly	At any time upon written request of any Member of the ***Project Management Team***

The chairperson of the Consortium shall convene these meetings. Unless otherwise agreed, the Coordinator shall chair all the Consortium bodies.

3.2.2.3.2. *Notice of a meeting*

The chairperson of the Consortium shall give notice in writing of a meeting to each Consortium member as soon as possible and no later than the minimum number of days preceding the meeting as indicated in table 10.

Table 10: 5G-MOBIX notification of management meetings

Body	Ordinary meeting	Extraordinary meeting
General Assembly	30 calendar days	15 calendar days
Project Management Team	14 calendar days	7 calendar days

3.2.2.3.3. *Sending the agenda*

The chairperson the Consortium shall prepare and send each Consortium member a written (original) agenda no later than the minimum number of days preceding the meeting as indicated in table 11.

Table 11: 5G-MOBIX agenda availability for management meetings

Body	Ordinary meeting	Extraordinary meeting
General Assembly	21 calendar days	10 calendar days
Project Management Team	7 calendar days	7 calendar days

3.2.2.3.4. *Adding agenda items*

Any agenda item requiring a decision by the Consortium must be identified as such on the agenda. Any Consortium member may add an item to the original agenda by written notification to all of the other members up to the minimum number of days preceding the meeting as indicated below.

Table 12: 5G-MOBIX agenda modifications for management meetings

Body	Ordinary meeting	Extraordinary meeting
General Assembly	14 calendar days	7 calendar days
Project Management Team	2 calendar days	2 calendar days

During a meeting, the Members of a Consortium Body present or represented can unanimously agree to add a new item to the original agenda.

3.2.2.3.5. *Representation in meetings*

All Consortium members should be present or represented at any meeting. They may appoint a substitute or a proxy to attend and vote at any meeting. Virtual representation, when possible, is permitted. Consortium meetings may also be held by teleconference or other telecommunication means.

3.2.2.3.6. Minutes of meetings

The Coordinator shall produce written minutes of each meeting which shall be the formal record of all decisions taken. He shall send the draft minutes to all members within ten (10) calendar days of the meeting.

The minutes shall be considered as accepted if, within fifteen (15) calendar days from sending, no member has sent an objection in writing to the chairperson with respect to the accuracy of the draft of the minutes.

3.2.2.4. Management of risks and quality assurance

The purpose of Quality & Risk Management is to guarantee the timely delivery of the Project results with high quality. As risks usually assess the quality of the project these two topics are usually combined. Within 5G-MOBIX this has not always been the case. For that reason, there is a specific quality management plan while risk management is part of the Project Management Plan (this Deliverable).

Risk management with a thorough analysis of potential risks and close monitoring of the defined corrective actions is an important factor in the 5G-MOBIX Project Coordination Plan due to the size and complexity of the project and the usage of novel technology. This is not only important in order to reach the objectives of 5G-MOBIX within the given time, budget and with high quality, but also to achieve a maximum of synergies with related projects and national 5G trial activities.

For above reasons, 5G-MOBIX will use the Failure Mode and Effects Analysis (FMEA)[4] as the basis for risk management. Although this process is usually employed for high risk projects (where loss of life may be an effect), this structured approach offers 5G-MOBIX tools for discovery of potential failures in the design and processes of the Project's activities. The process within 5G-MOBIX has been visualized in below diagram.

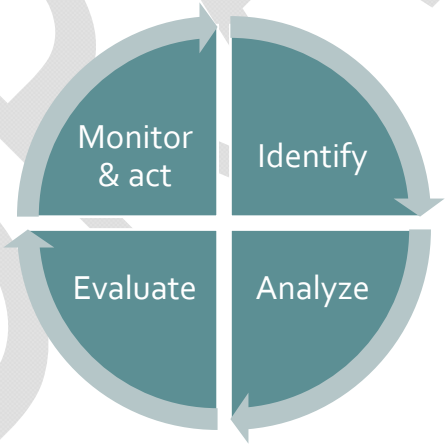

Figure 4: 5G-MOBIX risk management steps

As can be seen in figure 4, risk management is a cyclic process, for 5G-MOBIX the periodicity is related to the internal reports. As part of reporting, the risk management cycle will be executed as well, during the

[4] Raymond J. Mikulak, Raymond J. et al. 2017. The basics of FMEA (2nd ed.), Taylor and Francis; ISBN: 9781439809617.

process a dedicated risk session is held to identify and analyze the risks. A 'risk' is defined as a future event precluding the achievement of the objectives of a certain activity or task. Risks can be identified by any consortium member.

Within the risk management cycle the following steps are executed:

1. Identifying risks:

- WP, Trial Site and Task Leaders will identify the risks relevant to their activities or tasks and subsequently properly and promptly inform the Risk Manager who will add them to the risk register. For the identification, PESTLE[5] is used to extend the FMEA view adding behavioural and legal viewpoints.
- Risks will be formulated by using the sentence: "due to <cause> it may happen that <event/risk> resulting in <effect>." This will ensure a proper definition of all relevant items for the risk register.
- Identification of risks is performed continuously during the last step (monitoring and acting upon risks) and periodically in dedicated risk sessions.

2. Analysing risks:

- Analysing risks is performed during the dedicated risk sessions.
- During this step, all risks are assessed for their relevance. If a risk is no longer relevant it may be closed. An example is a risk related to the specifications phase when the specifications have already been delivered.
- Risks are assigned a risk owner/caretaker, being the *person* who will be able to detect and/or manage the risk best.

3. Evaluate risks:

- All risks are rescored using the FMEA scoring methodology. This methodology assesses Severity (S), Occurrence Probability (O) and Detectability (D) using pre-defined scales. The result is a Risk Priority Number (RPN). These elements are detailed in Appendix I.
- To facilitate scoring, a clean risk sheet is circulated amongst the partners with the request to score the risks. At least responses from all WP leaders and TMT members are necessary. The scores are averaged and consolidated.
- The risk register will be ordered using the RPN. For the top 20 risks, mitigating measures must be defined by the owner in cooperation with the PMT. Mitigating measures can be defined to influence cause, risk and/or effect.
- The new risk log has been uploaded to ECAS to allow for proper project monitoring by the PO and reviewers.

4. Monitoring and acting upon risks:

[5] Political, Economical, Soci(et)al, Technical, Environmental, Legal

- The top 20 risks are actively monitored during the PMT sessions. To ensure an even distribution of attention to the work packages' risks, the WPs will monitor their own top 3 risks.
- The top 10 risks will be actively managed. This means that any preventive mitigating measure will be put in place.
- When a risk occurs, the mitigating measure(s) will be put in place.

The risks are materialised in a risk register, which is based on the FMEA risk register. The risk register is updated by the Risk Manager.

The risk management process will be monitored in parallel by the Quality Manager. The complete list of quality management procedures is documented in D1.2 – *Quality Management Plan*. By defining clear procedures and establishing deadlines for deliverable production, review and submission, the Quality Manager will ensure low exposure to risk and the highest possible quality of 5G-MOBIX outcomes.

Table 19 in Appendix II presents the risks identified at the time of submitting version 4 of this deliverable, as of October 2019, an online version, on SharePoint, is continuously monitored and updated after this date.

3.2.3. Technical coordination

The Technical Coordination (TC) or Technical Management (TM) of the project is responsible for the technical aspects of the work performed in the project and needs to ensure that the solutions proposed and trials performed by 5G-MOBIX are technically sound, viable and in line with standardization activities. All Technical activities of the project under any CBC/TS should be organized under the leadership of the Technical Coordinator to make sure that the project follows a concise and coordinated technical approach. The technical coordination procedures are described below.

3.2.3.1. Technical coordination procedures

The Project's technical coordination takes place mainly in two different levels, via the Project Management Team (PMT) and the Technical Coordination Team (TCT).

- **The PMT** is comprised of the Project's Management Team, the CBC/TS leaders and the WP leaders and it meets (virtually) on a bi-weekly basis. In this forum, updates are exchanged among the leadership of the project and towards the PC and TC regarding progress achieved, issues and challenges on a per CBC/TS level and on per WP/Task level, as reported by the respective leaders. These regular updates are more targeted towards a higher management level and aim to ensure that all CBC/TS and WPs are following through with their technical tasks towards achieving their objectives on time. Based on the feedback received, coordinated guidelines and the next steps are transmitted back to the CBCs/TS and WPs, while when the need for a deeper technical session is identified the matter is passed on to the TCT.
- **The TCT** is a team of experts tasked with assisting the Technical Coordinator to monitor and align all technical activities across the project irrespective of WP/Task and CBC/TS. As the main technical issues to be addressed transcend the typical project structure and are equally important for all participating CBCs/TSs, the TCT offers a forum for technical discussions among the experts of the project. The TCT is comprised of five main technical expertise domains, led by five experts assigned by the TC, as detailed in the next sub-section. The TCT has more of an ad-hoc character as meetings among experts take place on a continuous basis throughout the project (led by the respective leader), while the domain leaders and

the TC meet at least once a month (with additional ad-hoc meeting when needed). Through this process any technical issue in any CBC/TS and/or WP is quickly detected, discussed and addressed while as an outcome the respective tasks in ClickUp (see Section 3.2.3.4) and the Risk Registry is updated from the respective experts and domain leaders.

3.2.3.2. Technical Coordination Team (TCT)

The role of the ***Technical Coordination Team (TCT)***, included in the Task T1.2 – Technical Coordination, is to assist the Technical Coordinator in keeping track of all the technical activities of the project, organize relevant tasks, identify risks and provide guidelines that will secure a solid outcome for the project. The goal is to have a much better oversight and be capable to offer assistance and guidance where needed.

3.2.3.2.1. Domain leaders

The ***Technical Coordination Team*** is composed of five people, each to lead and oversee the activities in five different domains / categories of technical activities. This TCT will be charged with communicating with the experts of each TS/CBC and get updates and help with issues irrespective of WP or Task or partner. They are also charged with being up to date with the current status of the project activities in their domain. The five domains and the people leading them are shown in Table 13.

Table 13: Technical Coordination Team Domains & Domain Leaders

Domain of Expertise	Domain Leader
5G Networks & Chipsets	Geerd Kakes (KPN)
Vehicles, OBU & RSI	Joao Almeida (IT)
Application / User stories	Emanuel Sousa (CCG)
Security / Privacy	Luis Bernal (UMU)
E2E Assessment	Dinos Katsaros (ICCS)

The domain leaders' general responsibilities are:

- Maintain the overview of activities in their domain across different WPs/Tasks and ensure that:
  - i) There is no duplication of work,
  - ii) All activities make sense and contribute towards a common objective,
  - iii) All activities are documented in respective deliverables (no repetition, no omissions)
- Check-in periodically (e.g. on a bi-weekly basis) with the CBC/TS experts of their field (each TS/CBC to nominate one) keep track of the progress and make sure they adhere to the plan (to be assisted by the Click-Up tool). It is very important that each Domain leader is always aware of the delivery dates, potential delays, etc. (when will each TS/CBC be able to deliver what)

- Participate in the TM Experts Group periodic telco where the experts update each other on the status of activities and take common decisions together with the TM about how to proceed further, or any other decision needed (frequency?)
- Double-check deliveries from TS/CBC and Tasks to make sure they adhere to the plan and are not just "procedural", and need to make sure that our deliverables make sense and are useful and that no relevant info is left out
- Monitor and update the Risk Matrix for their domain based on the feedback from the CBC/TS experts and the progress of work within the project

3.2.3.2.2. Domain Experts

For each of the above mentioned domains, the domain leaders have built a team comprised of one expert from each Trial Site and two experts from each CBC (one from each side of the border), who will be responsible to discuss and report to the domain leader for the activities and status of their respective domain in their TS/CBC. These experts need to be the real experts working on this domain and not management personnel, as they need to be discussing the technical details.
Expert's names and contact details, issues to be addressed by the experts and experts' responsibilities are described in dedicated tabs of an excel table for the project participants, available on the project repository, while an overview is presented below in Table 14.

Table 14: Domains Leaders and CBC/TS Domains Experts

Role	5G Networks & Chipsets	Vehicles, OBU & RSI	Application / User stories	Security / Privacy	E2E Assessment
Domain Leader	**Geerd Kakes (KPN)**	**João Almeida (IT)**	**Emanuel Sousa (CCG)**	**Luis Bernal (UMU)**	**Dinos Katsaros (ICCS)**
ES-PT Expert 1		Daniel Jáuregui (CTAG)	Daniel Jáuregui (CTAG)	Carlos Rosales (CTAG)	Marta Miranda (CTAG)
ES-PT Expert 2	Fernando Correia - RAN (NOKIA PT)	Tiago Dias (A-to-Be)	Emanuel Sousa (CCG)	Nuno Cruz (ISEL)	Emanuel Sousa (CCG)/António Serrador (ISEL)
GR-TR Expert 1	Ilker Yilmaz	Tahir Sari	Olcay Oztanir, George Vlachodimitropoulos	Effie Nikolitsa (COSM)	Serhat Çöl
GR-TR Expert 2	Ioannis Masmanidis	Seilendria Hadiwardoyo	Kostas Trichias		Spilios Evmorfos (ICCS)
DE Expert	Sebastian Peters (TUB)	Georg Pelzer (Valeo)	Gorka Vélez (Vicomtech)	Sebastian Peters (TUB)	Doruk Sahinel (GT-ARC)
FI Expert	Jose Costa Requena (AALTO)	Tapio Taipalus (S4)	Edward Mutafungwa (AALTO)	Jose Costa Requena (AALTO)	Edward Mutafungwa (AALTO)

FR Expert	Maissa Boujelben	Ahmed Soua	Oyunchimeg Shagdar	Marwane EL-BEKRI Mohamed El hadad	Sadeq Zougari (AKKA), Artiol Kalca (VED)
NL Expert	Marcel van Sambeek	Jos den Ouden	Emi Mathews		Bart Netten (TNO)
CN Expert	Liangjie Yu (SDIA)	Yanqiang Li (SDIA)	Lingling Lv (DUT)	Zihui Zhang (SDIA)	Yanjun Shi (DUT)
KR Expert	GOSAN Noh (ETRI)	YOU-JUN CHOI(KATECH)	YOU-JUN CHOI(KATECH)	Jungyu Cho(SnetICT)	Junhyeong KIM (ETRI)

3.2.3.3. Control of CBC and local TS contribution

The collaboration of CBCs with TS and the integration of TS solutions to the actual corridors of ES-PT and GR-TR are perhaps one of the most challenging activities within 5G-MOBIX. In order to guarantee that the envisioned contributions and integrations will go ahead as planned and that the CBC experts are in continuous discussions with the TS experts to guarantee interoperable solutions, the CBC/TS collaboration activities are monitored on two levels:

- ***From the TCT,*** the collaboration of CBCs and TSs fall under the responsibility of the "Application / User stories" expertise domain as the collaboration results from the defined User Stories in D2.1. The domain leader (Joao Mouthino) is tasked with monitoring the progress and discussions among the CBC and TS experts on their solution integration, offer advice and directions where needed and report any potential issues (and the achieved progress) back to the TCT.
- ***From the respective WP3 task (leaders)***, as most TS solutions to be integrated into the CBC user story and infrastructures are very specific in nature (i.e. Vehicle, OBU, RSU, application contributions) their development and progress is monitored and guided by the respective WP3 task (and its respective leader), responsible for this developments. All WP3 tasks have fixed bi-weekly calls where the experts of the CBC/TS report on their progress, including the activities around CBC-TS solution integration. As part of their WP3 task activities, each CBC/TS expert is required (followed up by each Task leader) to update the respective ClickUp task regarding the CBC-TS integration with the progress achieved, potential challenges, changes in dates, etc. Through the ClickUp tool the progress of each individual CBC-TS integration is visible to the entire management team.

As the TC receives regular updates both from the WP3 task leaders (via the PMT) and the TCT domain leaders, while the ClickUp tool is regularly updated to reflect the current status of activities, there is a very strong monitoring and guidance structure in place to guarantee the progress in the CBC-TS solution integration activities.

3.2.3.4. Tools

As 5G-MOBIX is a project of considerable size, with multiple sub-teams of experts and CBCs/TSs working in parallel and collaborating, management tools are employed to keep track of the progress achieved at each

CBC/TS in specific fields. These tools enable WP and Task Leaders to align, delegate and keep track of the work among the various partners. Additionally, the dependencies among the various activities of the different expertise groups and/or CBCs and TSs have to be clear, completion of certain tasks (affecting others) has to be tracked, and their progress has to be monitored. This will guarantee that 5G-MOBIX will deliver its output on time and with the correct technical specifications.

For these reasons the ClickUp[6] tool (project management & planning tool) has been employed within 5G-MOBIX to make sure that all required steps to reach our technical objectives have been thoroughly planned out and defined, their dependencies recorded and their progress monitored by the proper WP/Task leaders.

Within ClickUp, each CBC/TS breaks down their envisioned work per area of expertise (5G network, vehicles, OBU/RSU development, application development, Data monitoring & collection, etc.) into specific tasks and sub-tasks. Each (sub)task is defined with a start and due date, dependency with other tasks (if they exist), explanation of the implementation details of the task and they are assigned to a specific person within a 5G-MOBIX partner, who is responsible for making sure the task is completed on time and monitoring and updating its progress. The various inter-connected tasks provide an end to end picture of all the activities that need to be performed within a CBC/TS in order to deliver the networks, vehicles, applications and infrastructure needed for the trials, which can be viewed in a Gantt chart mode. Under the leadership of the Technical Management team and the WP and Task leaders, templates of Tasks have been created to guide the various CBCs/TSs and to guarantee the harmonization among the project's activities. Experts from each CBC/TS have declared when, how and by whom each task will be performed. Figure 5, figure 6 and figure 7 below provide some screenshots of the ClickUp tool and the various functionalities it supports.

[6] https://clickup.com/onboarding?fp_ref=48cb1

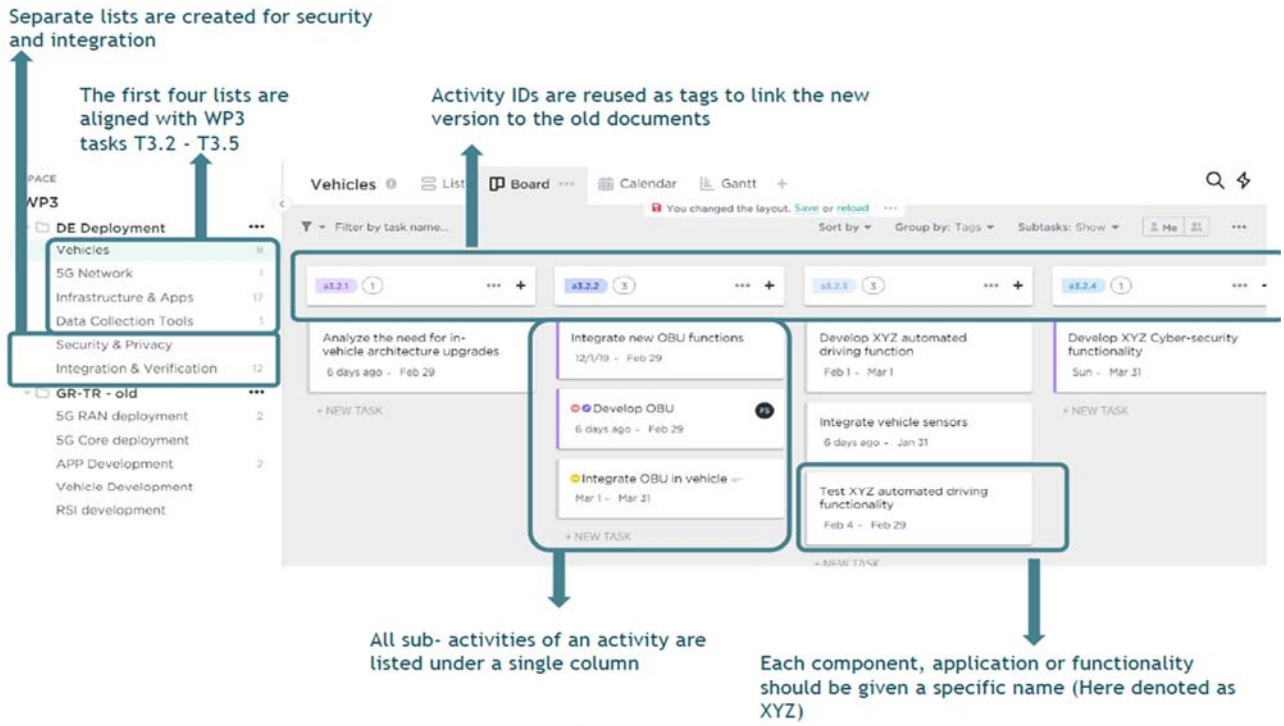

Figure 5: ClickUp tool – High-level activities example

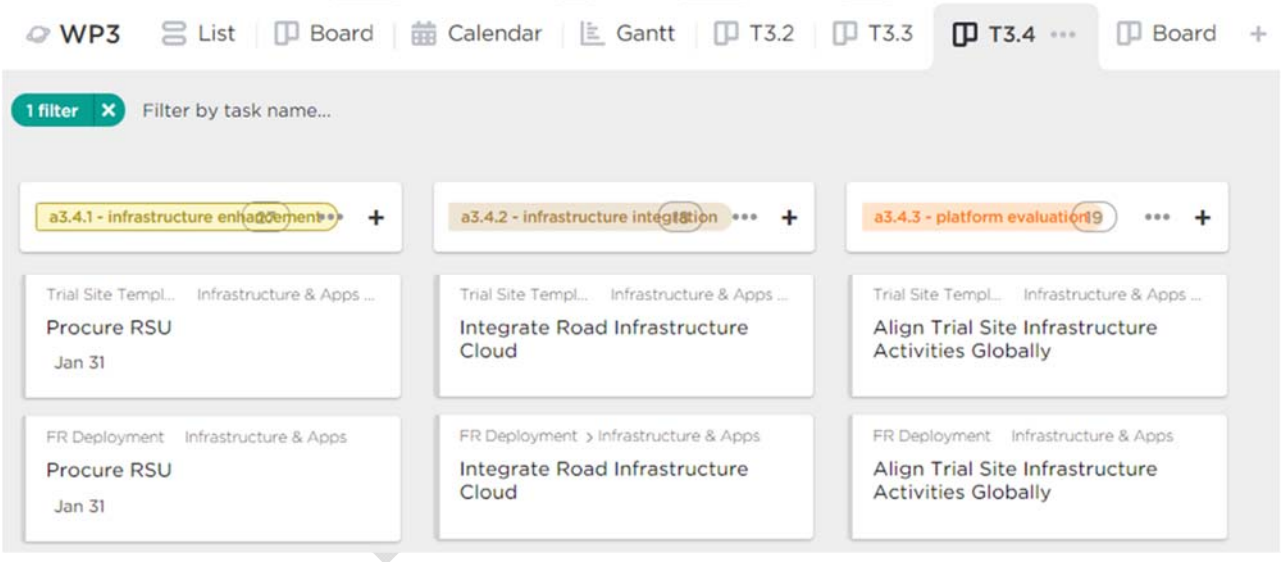

Figure 6: ClickUp tool – Task Overview of activities (Task Leader Board view)

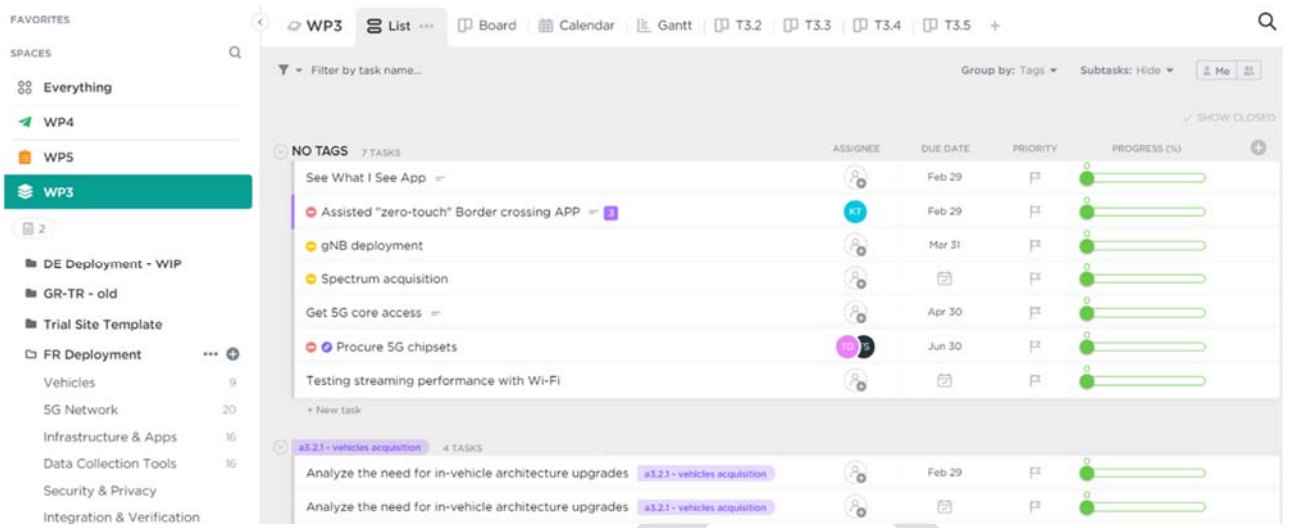

Figure 7: ClickUp tool – WP Overview of activities (WP Leader List view)

3.3. Project communication tools and services

The successful execution and culmination of a project depend to a large extent on participants having good tools and services at their disposal to facilitate project-internal communication and streamline workflow. For a large project such as 5G-MOBIX such management tools are indispensable and the Project has chosen a combination of tools for various purposes. The main among ones are:

- **SharePoint**: for sharing and archiving public deliverables, minutes and agendas, and for the IPR Registy
- **Sympa**: a listserv for targeted group-based internal communication
- **Website**: for newsletter-based internal communication and dissemination activities

To ensure that the Consortium receives relevant information in a timely manner, without an excessive use of email, Project communication will reflect the structure of the Project and will target the smallest possible group of members (via email or listserv). Targeted information sharing will be based on the classification of internal communication as 1) communication related to *project activity execution*, or 2) communication related to *administrative matters*.

Communication relating to administrative matters (financial statements, signature of contracts, payments, etc.) will be targeted to the administrative staff of each organization, which is not necessarily involved in the execution of project activities. To make sure that the information reaches all the staff involved in the administrative management of the project, the communication will be distributed to the contact persons identified as 5G-MOBIX contacts in the European Commission's participant portal (https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/myarea/projects).

When the Coordinator needs to communicate on administrative matters with the whole Consortium, he will address the list of contact persons downloaded from the EC participant portal. Therefore, in order not to miss any important administrative information, each partner has the responsibility to maintain this list up to date.

4. CONCLUSION

This document, deliverable D1.1 – *Project management plan*, is closely aligned with and takes as its starting point the Grant and Consortium Agreements of 5G-MOBIX. It details the roles and responsibilities of governance bodies as well as all beneficiaries and members of the Project Consortium. It describes the structures, tools, processes, and procedures that WP1 (*Coordination*) has instituted to ensure that the project runs smoothly and effectively and in accordance with the Grant Agreement.

An integral part of the *Project management plan* is 5G-MOBIX's risk management strategy based on the Failure Mode and Effects Analysis. It comprises these elements:

- Identification of risks, and registration of the identified risks in a risk registry available to all members
- Estimation of the probability of the occurrence of the risk event
- Estimation of the impact (i.e. the consequences) of the risk event
- Definition of the mitigation strategy and risk response plan
- Frequent updating and review of the risk registry by the Consortium management bodies, in particular through the regular PMT meetings

D1.1 is specifically relevant for the execution of Tasks T1.1 (*Administrative and financial coordination*) and T1.2 (*Technical coordination*). This deliverable will be complemented by the other deliverables in WP1, particularly D1.2 (*Quality management plan*) but also D1.3 (*Innovation management plan*) and D1.4 (*Data management plan*), as well as the communications plan of WP7.

Together with the Grant Agreement and the Consortium Agreement, this document is to be regarded as a reference for the overall project management of 5G-MOBIX, to ensure good organisation of work effort and high quality of Project results.

APPENDIX I. RISK MANAGEMENT BY FAILURE MODE AND EFFECTS ANALYSIS

5G-MOBIX uses the Failure Mode and Effects Analysis (FMEA)[7] for its risk-management as a basis. This structured approach enables discovery of potential failures in the design and processes of the Project's activities. By analysing the harmful effects of failures, the FMEA can identify, prioritise and ultimately mitigate the failure modes.

The risk assessment procedure by way of FMEA comprises four main steps with sub-steps:

- Step 1 – Identification and definition of the risks
- Step 2 – Risk validation
- Step 3 – Assignment of Risk Prioritisation Number
- Step 4 – Identification of risk mitigation strategy

In section 3.2.2.4 the implementation within 5G-MOBIX is described.

Step 1 - Identification and definition of the risks

WP, Trial Site and Task Leaders will identify the risks relevant to their activities or tasks and subsequently properly and promptly document them in the risk register. In addition to technical and organisational issues, possible risks will pertain to behavioural and legal issues as well. For each solution the following indicators should be provided:

1. Risk identification → What is the risk associated with the implementation of this solution?
2. Risk effect → What effect will the occurrence of this risk have?
3. Risk cause → What could be a possible trigger for this risk?
4. Risk detection and recognition → How would this risk be detected when it occurs?

Step 2 - Risk validation

All risks will undergo a validation process to rank them and assess their priority. This step involves assessing each risk based on a severity, occurrence probability and detectability index.

- ***Risk Severity (S)***

  The severity levels for technical and organisational failures are presented in table 15.

[7] Raymond J. Mikulak, Raymond J. et al. 2017. The basics of FMEA (2nd ed.), Taylor and Francis; ISBN: 9781439809617.

Table 15: Unmitigated severity levels for risks

Rating	Severity (S)	Technical / Organisational issue
9 – 10	Disastrous	The most serious effect of the failure mode would result in Project failure.
7 – 8	Severe	The failure mode would result in disruption of one or more of the items in terms of the Project's scope/time/resource definition and require serious reorganisation.
5 – 6	Moderate	Failure mode would result in considerable delays, reworking or reorganisation. Some changes to roles and responsibilities may be required.
3 – 4	Slight	Failure mode would cause some minor delays or reorganisation.
1 – 2	Irrelevant	There would be no discernible effect in terms of the Project's end goal.

- ***Risk Occurrence Probability (O)***

  The occurrence probability index, presented in Table 16 below, provides a ranking based on the probability that all the risk causes related to the risk modes described in the analysis can occur.

Table 16 : Risk occurrence indicator scale

Rating	Occurrence Probability (O)	Technical / Organisational issue
9 – 10	High	This failure mode is almost certain to occur.
7 – 8	Moderate	There is a moderate possibility for the failure mode to occur.
5 – 6	Occasional	There is a possibility of occasional occurrence of the failure mode.
3 – 4	Remote	There is a slight probability that the failure mode will occur.
1 – 2	Improbable	It is unlikely that a failure mode will occur.

- ***Risk Detectability (D)***

Finally, the detectability index (table 17) describes the probability of detecting the occurrence of a risk mode identified in Step 1 of the methodology. Detection of a developing risk is crucial for overall risk management and early detection is a prerequisite for the effective application of mitigation strategies. Using additional sensors and processing along with monitoring and feedback throughout the Project are important tools for risk detection.

Table 17 : Risk detectability indicator scale

Rating	Detectability (D)	Technical / Organisational issue
9 – 10	Low	It is impossible or improbable that the technical/organisational failure will be detected.
7 – 8	Fair	The issue is detected only in particular cases.
5 – 6	Moderate	It is probable that the technical/organisational issue will be detected.
3 – 4	Good	It is highly likely that the technical/organisational issue will be detected.
1 – 2	High	It is certain that the risk outcome will be detected.

Step 3 - Risk Prioritisation Number assignment

After each risk is classified based on the Severity (S), Occurrence Probability (O) and Detectability (D) indices, a Risk Priority Number (RPN) is assigned to it based on a straightforward formula:

$$\mathbf{RPN = S \times O \times D}$$

Based on this equation, the RPN of each risk will vary from 0 to 1000 and fall into one of five categories: disastrous, severe, moderate, slight, or insignificant as shown in table 18.

Table 18 : RPN and risk categorisation

Risk category	Risk Priority Number	Mitigation possibility
Disastrous	513 - 1000	Very High
Severe	217 - 512	High
Moderate	65 - 216	Medium
Slight	64 - 9	Low
Insignificant	0 - 8	Improbable

Step 4 - Mitigation strategies identification

The risk register will indicate the Work Packages or Trial Sites implicated by the risk and assign a caretaker for each risk, who will follow its analysis and mitigation. Mitigation of the risks adverse effects will rely on a risk reduction strategy by way of an iterative process. Some ways to do this will include:

- Reducing the probability of the hazard occurring
- Increasing failure detection speed and probability
- Reducing the magnitude (severity) of the consequences of the potential hazard
- Protecting against the risk-mitigating strategies to compensate for a failure (e.g. back-ups)

Table 19 presents the risks identified at the time of resubmitting this deliverable. As of October 2019, an online version, on SharePoint, is continuously monitored and updated after this date.

APPENDIX II. RISK REGISTER

Table 19: 5G-MOBIX critical risks and mitigation actions, sorted with descending RPN

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probability	Detectability	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker

U12	**19**	**Organisational (Evaluation)**	Erroneous/unreliable evaluation data.	Failure to deliver meaningful results.	Inadequate evaluation framework and experimental plans or wrong application of them across the sites. Failure in logging mechanisms.	While processing the collected data during field trials execution.	8,13	6,00	3,38	**164,53**	Multi-phase evaluation methodology: T2.5, T3.5, T4.1 and T5.1 iterative process, and verification (T3.6) as well as roll-out (WP3) is implemented to ensure the data collected is according to expectations. Clear and comprehensive data management plan. Dry runs of the overall evaluation process during the early trials phase. A comprehensive Technical Report/Living document maintained to keep up to date information regarding the Evaluation Framework consolidated and thus ensure smooth collaboration between involved WPs. Local Assessment process, based on local data format, aimed to enable early detection, before engaging in Global Assessement (across Test Cases).	WP2, WP3, WP4, WP5	**WP5 leader (ICCS)**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U30	40	Organisational / Technical	The network is not yet stable and HO has not yet been achieved in the border areas to allow the use cases to be completed. Need to define and work with network configurations. This affects both Agnostic Tests and Trials and therefore has a direct impact on the Evaluation.	Inability to properly proceed in the next phases (WP3 , WP4 and WP5)	The network is still experimental and commercial network work is ongoing on the Es side so changes cannot be immediate.	Continuous follow up and collaboration among CBC and TS experts	8,43	6,00	3,14	**158,94**	Continuous monitoring. Teleoperators work on solving network problems. The definition of the OP is awaited in order to propose an appropriate strategy.	**WP3, WP4 and WP5**	**NOKIA ES-PT, NOS, TELEFONICA**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U20	30	Technical	Change of the spectrum allocation in Spain, which has been pending since last year.	It may coincide with the trial period, which would imply a delay in planning.	Spectrum allocation	Mainly in task 4.3.	7,25	5,50	3,50	**139,56**	Depending on the assigned spectrum, the change may only involve an update in the configuration or changes in some of the equipment.	**WP4**	**ES-PT CBC Leader (CTAG)**
U34	44	Organisational / Technical	Lack of coordination between UCC/US-Agnostic verification testing and Evaluation process	Questionable generality of dellivered results and conclusions.	Two corresponding sets of Test Cases managed within different WPs (WP3 and WP5), building on different measurement practices.	Communicatio n between WP3 and WP5 leaders	7,00	5,57	3,43	**133,71**	Continuous and in depth monitoring and communication with CBC/TS testing teams. Elaborate discussions and clarifications on targeted KPIs. TM Experts Group level co-assessment of corresponding Test Cases.	**All**	**ICCS**
U22	32	Organisational	The amount of issues found during the trials that need to be fixed for continuation of the trials, is higher than anticipated, and available within the time and budget	Delays and overspending	Usage of the technology in the trials and subsequent increase in detected issues	PMT and status discussions, reporting, issue overview from technical management	6,88	5,50	3,38	**127,62**	Using continuous monitoring of progress and issues we create the possibility to shift budget towards the partners needed most in the tasks resolving the found issues.	**WP1**	**Project Coordinat or (ERT)**

U25	35	Technical	Due to unavailability of data (full or partial dataset), potential unavailability of evaluation of the results.	Inability to test the tool chain, potential delays in the production meaningful quantitative results and overall conclusions	Severe delays of trials	Frequent updates from trial sites needed	7,25	5,38	3,13	121,78	Define exact dataset necessary and its format, goes through WP3 in terms of deployment. Border tests next days. Deploy CTS before early trials is done.	WP5	WP5 leader (ICCS)

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U4	7	Technical	Due to limited scale of trials, evaluation data is not sufficient to build statistical confidence in results	Inability to produce meaningful results and overall conclusions regarding techncical evaluation, impact assessment and user acceptance.	Limited scale of project trials (number of vehicles, number of drivers, number of passengers, number of test iterations)	Continuous monitoring on a WP5 level, including meetings and discussions with trial sites and use case leaders, as well as frequent (weekly) reporting on evaluation progress	8,00	5,43	2,71	**117,88**	Continuous monitoring of evaluation scenarios and corresponding planning. Central assessment of CBC/TS trialling plans, as manifested in the Test Case Descriptions, regarding the number of iterations per Test Case. Plans for detailed recommendations regarding statistical confidence including suggest number of iterations according to the targeted KPI and Test Case nature, statistical processing of results and quantification of statistical confidence.	**WP5, T5.2, WP4, T4.2-4.9**	**WP5 leader (ICCS)**
U26	36	Dissemination	Standardisation: increase output of D6.3	Low output of T6.3	Lacking participation of partners in standardisation activities	Frequent updates from trial sites needed	6,17	7,50	2,17	**100,21**	Proper communication within the project (trial sites, standardisation partners and WP6)	**WP6**	**TURKCELL**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U29	39	Organisational	The authoritations for road closures for ES-PT trials are not being obtained.	Delays	Slowness in managing permits for road trials and disagreement on required closure times	Mainly in task 4.3 and Contributions.	7,92	5,00	2,50	**98,96**	Review and adaptation of proposals for the procurement of services. Changes in the order of tests, bringing forward those not dependent on road closures. Trial in the weekends/at night? In CW30 new meeting and resend a new proposal for all the trials planning. The permissions have arrived in week 37. That same week, the tests begin. It remains open as changes in dates or schedules may occur at the request of any of the authorities involved. The risk can be closed.	**WP4**	**ES-PT CBC Leader (CTAG)**
13	4	Technical	Verification Process is not completed on time, thus creating issues for the proper trialing of the Use Cases.	Inability to perform value adding evaluations. Inability to perform all scheduled evaluations (under all envisioned configurations)	Integration difficulties, bad planning, unavailability of equipment, unexpected malfunctions	Gradual verification process as part of T3.6 activities, following infrastructure deployment	6,56	5,44	2,67	**95,18**	Multiple experts from all CBCs/TS verify the suitability of each CBC/TS design for the proper evaluation of the undertaken UCCs, as part of T3.6. Assignment of specific TSs to assist a CBC in case of such an issue.	**WP3**	**T3.6 leader (VTT)**
U9	15	Organizational	Lack of participation of stakeholders (OEMs, Public Authorities, etc.) in questionnaires or any inquiry about their view on CCAM using 5G.	WP6 definitions not being adjusted to real scenarios or future demands.	Lack of availability, fear of sharing privileged information, not wanting to commit with any option at this point.	Not having any input from them after two consecutive deadlines provided; Getting a negative response from them.	5,50	6,17	2,67	**90,44**	Informing stakeholders about the advantages to them in participating in this early stage of definition. Involving them in the project (considering the limits of privileged information). See T6.2: second questionnaire is coming. Workshop and interviews completed. Webinar is being planned.	**WP6**	**WP6 leader (INTRASOFT)**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
12	9	Technical	Actual implementation deployment and roll-out of CBCs diverges from deployment planning. CBCs/TSs are not ready on time to perform the necessary trials.	Delays in trial executions	Equipment availability, roadmap updates, delays in development process, unforeseen technical issues discovered during final integration testing.	Regular updates of planning / actualization map	7,14	5,86	2,14	**89,65**	T3.1 performs a regular update of the actualization of the infrastructure deployment at the CBCs and compares to the planning. Constant communication among CBC/TS leaders. Updates in trial planning may allow for later trials (available time until the end of the project)	**WP3 (T3.1)**	**Technical Coordinator (WINGS)**
15	10	Economical, Technical, Organizational	We may not be able to, travel, work (as much as we want/need), develop, test, implement, trial and/or evaluate to deliver the results	Inability to deliver (parts of) the project, within the budget and/or on time impacting trials, results and achievement of objectives.	COVID-19 and related restrictions	Monitoring of (internal) milestones & quality (see quality management plan), specific agenda items in meetings (at least the PMT and TMT) and reporting	6,60	5,80	2,25	**86,13**	- Tight Coordination with the PO and the TS/CBC leaders. - The work will be performed remote when possible. - Plans B will be created for work that is either on-street and/or requires cooperation between multiple partners. - High frequency monitoring (see detection) will ensure a short reaction time. - Extending The project.	**All**	**Project Coordinator (ERT)**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probability	Detectability	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U6	**12**	**Technical**	Support of CTS and CDf from all TSs/CBC. Difficulty to align with all used tools. Upload of agnostic test measurements on the CTS under the CDF.	Not all data are collected at one central location. Difficult to perform comparisons and to gain insights from trials.	Different tools and methodologies used for data collection and processing at each TS/CBC. Adopted methodologies are hard to change. Very detailed data requested	Availability of a clear early design of the data collection requirements and agreement among CBC/TS leaders regarding tools	6,89	4,78	2,56	**84,11**	Participation of CBC/TS experts in the data collection and management tool design. Testing of compatibility during the various development phases. CTS and data logging formatting has been agreed among all partners.	**WP3**	**T3.5 leader (AKKA)**
U7	**13**	**Regulatory**	No or partial testing across the GR-TR border	Non-compliance with cross-border testing	The current measures against the COVID-19 pandemic, the refugee crisis between Turkey and the EU as well as some of the other tensions in the region may create political obstacles for cross-border tests.	Regulatory and legal compliance	8,75	5,25	1,75	**80,39**	Early contacts with authorities. Frequent engagement with the ministries and the public authorities to explain the importance of the project in order to secure their support. Written consent from the customs agencies on both sides of the border. Cooperation with the public personnel to comply with their directives and suggestions for making the tests.	**WP4**	**WP4 leader (VEDECOM)**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U13	20	Organisational (Exploitation)	Conflicts of interest between partners on commercial model	Delay in delivery of results and / or partners' withdrawal from the project.	No common understanding of project goals; lack / change of commitment.	Contribution to deliverables stops; technical / research work does not progress.	6,33	4,42	2,67	**74,59**	The Project Consortium was built with a variety of complementing stakeholders. All Project beneficiaries will have the possibility to contribute towards the development of the exploitation plan and list their interests. An IPR registry will be maintained to clearly list ownership and rights.	WP1, WP6, WP7	**Innovation Manager (VICOM)**
U35	45	Organisational	Lack of involvement of participants in the tests	Delay of local tests, trials and evaluation. Hence, delay of WP3-WP4-WP5 contribution.	User story tests at Ford Eskişehir test track is performed with limitted help. User story owners don't visit the test track to perform required tests.	Easily detected. Communication with risk owner and GR-TR leader (Nazlı)	7,60	5,40	1,80	**73,87**	Continuous monitoring of contributions at biweekly GR-TR meetings and WP3-WP4-WP5 meetings. Responsibles must be defined per user story. Mitigation plan is needed to be defined by user story owners.	**GR-TR, WP5**	**FORD**
U32	42	Organisational / Technical	Insufficient planning for Evaluation Activities	Delays to deliver proper results to WP5 Evalutaion	Insufficient planning for Evaluation Activities	Weekly communication in WP5 meetings, Input in Test Case Overview Excel Sheet	7,20	4,60	2,20	**72,86**	Conitnuous monitoring, adaptation of the trials activities to better take in account the evaluation activities and when data is collected;	**GR-TR, FI, NL, WP4, WP5**	**VEDECOM**
U27	37	Organisational	Increase activities in trial sites, result in potential delays (availability of WP6 partners)	Delays in WP6 results	Availability of key partners for interviews/data collection/validation activities	Easily detected	6,00	6,00	2,00	**72,00**	Keep the data collection balanced, targeted stakeholder activities. Ease interaction with non-WP6 partners.	**WP6**	**WP6 leader (INTRASOFT)**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U33	43	Technical	Insufficient coverage of XBI-CS pairs in Evaluation . Consistency and clarity of the examined XBIs and the specific CSs.	Unclear evlaution results and lack of interesting and impactful insights. Uncoordinated output of the project.	Unclear input form CBCs/TSs. Executing trials without specific evaluation targets. Not defining clear and detailed test cases.	TM Experts Group periodic inspection of TC plans	6,71	5,00	2,14	**71,94**	Continouous assessment of XBI/CS coverage by Test Cases on a central level i.e., WP5 and TM Experts Group. Recommendations for improvements towards CBC/TS.	**All**	**ICCS**

9	8	**Technical**	Lack of clarity regarding the contributions of TSs to CBCs. Lack of organized approach to offer isights on complementarity of solutions. Lack ofharmonized approach, offering harmonized evaluation conclusions based on cross-TS/CBC comparisons	Limited impact of evaluation of the applied solutions. No availability of cross-comparisons. Duplication of work	Lack of coordination between the TS & CBCs	Part of monthly dedicated telco. Updates during WP3 and WP4 telcos.	5,75	5,00	2,50	**71,88**	The User Stories have been defined in WP2 with the clear objective to highlight the added value of the trial sites to the cross-border corridors. Specific TS contributions to CBCs have been defined as Tasks in the ClickUp tool and assigned to specific people with given deadlines and dependencies. Much easier to track progress and guarantee significant contributions from TSs. Moreover, a special task force has been created, led by the TM Experts Group, to monitor the progress of all User Stories of the project and the collaboration between the CBC and TS User Story experts.	WP2, WP3, WP4, WP5	**UserStory /Applications technical coordinator (CCG)**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker

U31	41	Organisational / Technical	Lack of coordination and alignment with WP5 established processes and Evaluation Framework (High Risk Severity)	The data obtained might be incompatible with the rest of the consortia, limiting the evaluation data to that of the ES-PT CBC.	The initial planning during proposal preparation stage did not have enough participation in WP5 from the GR-TR CBC, and this was unnoticed until the second year of the project. The evaluation framework was already set then, and it was not possible to have the GR-TR network measurement capabilities accepted by the WP5. Moreover, the fingers were pointed only at the network experts while the evaluation has to be performed for the user stories, where in fact application and terminal-related tools and methods are necessary to deliver the measurement requested.	Weekly communication in WP5 meetings	7,60	5,00	1,80	**68,40**	Discussions among the GR-TR partners to assign tasks	**GR-TR CBC, WP5**	**TURKCELL**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probabilit	Detectabi	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
					Thus, the suggestions from WP5 were misleading.								
8	6	Organisational (Dissemination & Exploitation)	Limited dissemination & exploitation impact: Low interest or engagement of 5G-MOBIX target stakeholders	Low or no user/stakeholder acceptance. Low awareness of the Project and the Project results.	Lack of Project beneficiaries' commitment to dissemination and exploitation activities. Delay in planning of dissemination and exploitation activities (e.g. workshop, demonstration event) due to delays in e.g. pilots readiness, etc.	Low response rate / participation in the Project's dissemination channels & activities (newsletters downloads, webinars, social media followers, workshops), low interest of stakeholders especially towards the end of the project.	5,75	4,40	2,70	**68,31**	Targets (KPIs) for activities are clearly defined, shared with partners who are encouraged to contribute to the effort regularly, and monitored. The KPIs have been raised since the project start. The Dissemination & Exploitation plan includes a sound selection of channels and planned activities to keep all stakeholders in the value chain informed, involved, on a regular basis. The plan has been re-evaluated and updated periodically. Partners are regularly contacted for monitoring their planned activities, encourage them to look for new opportunities for presentations and publications. WP7 organises itself presentations at key events, webinars, interviews of partners to create more content for the communication & dissemination channels	WP1, WP6, WP7	**WP7 leader (ERTICO)**
U37	47		Risk to rerun things because something not going the way it was supposed to be (to be reformulated)				6,33	5,33	2,00	**67,56**		**DE**	**Dai labor**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probability	Detectability	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U3	3	Organisational	Non-attendance at consortium meetings	Project delays	Delays in decision-making	Delays in deliverables and milestones	5,20	4,83	2,50	**62,83**	Less project follow-up meetings. Offline monitoring.	**ALL**	**Project Coordinator (ERT)**
U38	48	Organisational / Technical	Lack of responses from ES-PT CBC concernant the requirement of public IP for Multi-PLMN tests.	Inability to make FR/FI common contribution to the ES-PT CBC.	Lack of effort to find a solution.	Communication between ES/PT and FR/FI TS.	6,50	5,50	1,50	**53,63**	Check if a ES-PT partner can open an public IP for these tests.	**FR, FI**	**VEDECOM**
U36	46	Organisational / Technical	Due to the continued development of the roaming standards, it may happen that the eventual standard arrives later than the trialing window, resulting in an inability to trial these roaming standards	Inability to trial roaming standards	Standard arrives later than the trialling window	Monitoring of roaming standards	5,60	5,60	1,70	**53,31**	We will continue trialing the concept versions of the standard as they arrive up to the end of February. Any adapted standards later cannot be trialed such that it can be part of evaluation	**NL, FI, all TS/CBC, WP3, WP6**	**VEDECOM**

Portal Id	ID	Category	Potential failure mode (risk)	Potential effect of FM	Risk cause	Risk detection	Severity	Probability	Detectability	RPN	Risk mitigation measures	Relevant WPs	Risk caretaker
U10	17	Organisational (Dissemination & exploitation)	Limited number of dissemination results published on the 5G-MOBIX website	Perceived low level of dissemination activities and thus of project's visibility and impact achieved	Dissemination activities performed by partners not systematically reported to WP7 and Task 7.2 Leader	Low number of dissemination activities reported. Low number of entries published in related 5G-MOBIX website sections	5,22	3,78	1,67	**32,88**	Partners' planned activities are regularly monitored. Clear procedures set in place to report dissemination activities as recorded in D7.3 and regularly reminded to partners. PMT meetings are used as internal information channel (and WP Leaders as relay) for reminders	**WP7**	**WP7 leader (ERTICO)**

APPENDIX III. D1.1 REVISIONS BASED ON THE REVIEWS

This appendix contains an overview of the changes made within D1.1 as a result of the reviews. The purpose is to assess the (completion of the) implementation of the recommendations to this deliverable.

III.1 Technical review #1

Feedback

A more concrete project management plan should have been elaborated at this stage considering the size and nature of the project (a). A more concrete risk management plan as well as a plan for the enforcement of the data protection and ethics requirements needs to be put into place and explained in the management plan (b). Some aspects, such as the organisation of the steering committee and the Advisory board members, remain unclear (c). The risk identification and mitigation measures are not acceptable and do not address the risks related to management the migration path from local to cross-border sites (d).

Response

NA

Implemented changes:

- Extension of governance (project decision making bodies and processes) (a)
- Detailing of the External Advisory Board (a, c)
- Detailing of resource monitoring (a)
- Implementation of data protection enforcement (b)
- Introduction of FMEA risk management and update of the risk log (d)

Resulting version

V2.1

III.2 Technical review #2

Feedback

This is a re-submission of the deliverable due in M2. The quality and depth of the deliverable has not improved (a). Most of the sections are still cut and paste from the proposal and even simple things such as an update on the list of members of the steering committee is not in place (b). The last reorganization of the management structure produced after the last review meeting is not reflected in the document either (c). The deliverable is, therefore, too high level and does not adequately describe procedures for managing consortium activities in such complex and risk scenarios such as those envisioned in 5G-MOBIX (d). This includes not only the management complexities of CBC conditions but also the need for local sites to contribute and integrate developments in CBC sites (e). The deliverable should better explain how the project leadership (admin and technical leadership) plans to organize and coordinate these activities to ensure maximum effectiveness (f). Risk management is yet too

general and not sufficiently strong considering the complexity and challenges of 5G-Mobix (g). Some parts are also inconsistent (h). For example, Table 6 contains two "most serious effects", the text uses failure mode and fault interchangeably although they should be clearly defined. Some risks, such as not having 5G frequencies and equipment for stand alone 5G (- > URLLC use cases) are insufficiently discussed (i). More specific and detailed management procedures are necessary to ensure project activities are under controlled, well monitored and collaboration/ integration is well planned and executed (j). The document still contains many typos and page 34 has broken sentences and unfinished paragraphs (k).

Response

Improving the deliverable is understood, but the fact that the governance is similar to the proposal seems logical, as the proposal includes the description of the project governance. Also the risk management has been improved significantly. Nevertheless, it is understood that the deliverable should be improved however, especially the discrepancies raised by the review report and the process of handling

Implemented changes

- Update of the management structure (a, b, c, h)
- Extension of the Technical Coordination team through the addition of TM Experts with specific areas of responsibilities (c)
- Update of Technical Coordination way of working, a.o. though the implementation of ClickUp (a, f, h, j)
- Update of the risks (g, h, i)
- Detailing of governance procedures (a, d, e, h)
- Update of the executive summary (a, h)
- Corrections of typos, sentences and consistency (h, k)

Resulting version

V3.1

III.3 P1 review

Feedback

This document has improved with respect to the previous versions and has been updated to incorporate the current changes in the management structure of the project. As a general comment, try to avoid writing lengthy deliverables without a substantial contribution to the project.

The report has been updated and the challenges of management and coordination of TS and CBCs have been redefined.

The project management should check whether the deliverable must be revised and resubmitted to include recommendations of the review and the extended impact of Covid-19 pandemic with regards to the project management. Figure 2 should be re-done considering the project extension. (a)

The milestones table should also be revised to reflect on the new time planning of the project. (b)

Monitoring and controlling the production of the deliverables and monitor the risk register should be tasks of the PC or PMC and not really the TC. (c)

Table 16 must be revised to include all risks and mitigation actions necessary due to the prolonged effects of Covid-19 pandemic. (d)

The additional steering board has been removed leaving GA and external advisory board, as suggested. Also a TCT (Technical Coordination Team) has been added.

The risk plan has been updated.

Response

NA

Implemented changes

- Simplification of Risk management to make it more pragmatic and consistent at the same time (c)
- Update of management structure and reasoning for it, e.g. Quality & Risk manager (c)
    - Risks have been raised to generic project management level
    - Clarification on the deliverable monitoring process (it is on PMC level)
- Update of timing of deliverables and milestones to fit with the project extension (b)
- Change in coordinator
- Update of the risk register (d)
- Check and clarification of COVID impact (a)

Resulting version

V4

III.4 Technical review #3

Feedback

This deliverable describes the management plan. The document is a re-submission from March 12th, 2021. In general, the deliverable is much better that it was but still not all recommendations from previous reviews have been taken into account (a). The deliverable still contains a lot of information that does not seem to be relevant for the reporting period and that are simple repetitions of the DoA (b). There is no information about the External Advisory Board other than the names of the members (c). It would be good to know how they are going to be engaged, what the project expects from them, etc. Risk management has been improved but the document still lists risks that have no IDs in the portal, meaning that the table has not been updated accordingly (d). Finally, there are still errors in the references, which means that the quality assurance process does not seem to be working as it should (e).

Response

The recommendations of the last reviews have been meticulously followed to ensure the deliverable was fitting to the needs of the reviewers (the document is already fitting for our needs).

Please clarify next time which specific remarks have not been taken into account.

The document is a plan for the full project and lists management processes, procedures, and mandates (and not specifically for a reporting period). There indeed is overlap with the DOA (as there should be) to ensure a complete, comprehensible, and usable plan that stands on its own.

For the resubmission we will:

- Re-check the remarks of earlier reviews (a, see next paragraphs).
- Copy the purpose of the AB from the Consortium Agreement.
- For Risk management we will ensure the EU portal's risk table is updated each time we have a new list.
- The errors in the references will be fixed.

Observations after check with earlier reviews

For each review listed within this Annex, markings are made in the review text (e.g. a). In the implemented changes, these markings are referred to as to ensure a full check.

- TR#1 - All items have been followed up
- TR#2 - All items have been followed up
- P1 - The P1 report does not mention omissions in following up earlier review feedback. Therefore TR#1 and TR#2 can be considered completed. The new items from the P1 review have been followed up.

At this point it is unclear what items have not been followed up as we also have indicated in the response. Furthermore, a review comment on overlap with the DOA (b) has been clarified in TR#2 already as being logical (and desirable).

Implemented changes

- Clarified the purpose of the Advisory Board (c)
- Addition of an additional step in Risk management to ensure the PO and reviewers have access to the latest risk log (d)
- Updated references

Resulting version

V5.0