SHared automation Operating models for Worldwide adoption

SHOW

Grant Agreement Number: 875530

D14.5: SHOW Project Management, Quality Assurance & Risk Assessment Plan – Second update

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement no 875530

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Executive Summary

This document, standing for *D14.5: SHOW Project Management Plan, Quality Assurance & Risk Assessment Plan – Second update* is the second update of *D14.1 SHOW Project Management Plan, Quality Assurance & Risk Assessment Plan*, which was submitted in M03 and followed by the first update provided in D14.4 submitted in M18.

The changes in comparison with D14.4 are highlighted in the whole document in grey.

D14.5 – similarly to the original version D14.1, and the first update delivered in D14.4 – outlines the project vision, aim, objectives, KPI's, key innovation and expected impacts, the internal governance procedures of the SHOW project, including detailed activities scheduling, allocation of responsibilities among Partners, Deliverables and Milestones planning, full definition of governance scheme layers with activities and roles assigned to each, addressing also the project Advisory Board and its liaison to the project. It also includes the Quality Assurance Plan and relevant quality conforming processes defined for the project, with definition of the Quality Control Board (QCB) and responsibilities assigned respectively. It finally encompasses the methodology for the risk assessment strategy (on project level) against which the annual project risk assessments are performed.

The main updates are related to:

- The Consortium, since some entities names have changed and an on-going Amendment procedure may affect the number of entities involved in the project
- The Gantt chart, with changes of the ending dates of Work Packages (Figure 2)
- The Demonstration Plan (Figure 3)
- The Demonstration Sites (Figure 4)
- The SHOW Objectives, KAIs, and KPIs (Table 1)
- Expected impacts as reflected in DR-ART-04-2019 vs SHOW (Table 2)

Document Control Sheet

Start date of project:	01 January 2020
Duration:	48 months
SHOW Del. ID & Title:	Deliverable 14.5: SHOW Project Management Plan, Quality Assurance & Risk Assessment Plan – Second update
Dissemination level:	PU
Work package:	WP14
Relevant Activities:	A14.1: Administrative, financial and strategic management - UITP A14.2: Technical and Innovation project management - CERTH/HIT A14.3: Quality & Risk Management – ERTICO
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Internal Reviewers:	Project Management Team
External Reviewers:	-
Due submission date:	30/06/2022 (M30)
Actual submission date:	30/06/2022
Status:	SUBMITTED
File Name:	SHOW D14.5_Project Management_Plan_Second_Update

Document Revision History

Version	Date	Reason	Editor
1.0	10/06/2022	Updated document sent for internal peer review and update by the Project Management Team	Henriette Cornet (UITP) Justyna Beckmann (UITP)
1.1	22/06/2022	Updated document with input received from the Project Management Team	Justyna Beckmann (UITP)
2.0	28/06/2022	Final version ready for submission by the Coordinator	Henriette Cornet (UITP) Justyna Beckmann (UITP)

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Abbreviation List

Abbreviation	Definition
5G	Fifth generation of wireless communications technologies
AaaS	Automation as a Service
AB	Advisory Board
AGE	AGE Platform Europe
AI	Artificial Intelligence
ALICE	Alliance for Logistics Innovation through Collaboration in Europe
API	Application Programming Interface
ARTS	Automated Rapid Transport System
AV	Autonomous Vehicle
CA	Consortium Agreement
CCAV	Cooperative Connected Automated Vehicles
CEO	Chief Executive Officer
C-ITS	Cooperative Intelligent Transport Systems
CLEPA	European Association of Automotive Suppliers
CO_2	Carbon Dioxide
CT	Cooperation Tool
DL	Deliverable Leader
DoA	Description of Action
DPIA	Data Privacy Impact Assessment
DPM	Data Management Plan
DPO	Data Protection Officer
DRT	Demand Responsive Transport
DSS	Decision Support System
EARPA	European Automotive Research Partners Association
EASME	Executive Agency for Small and Medium-sized Enterprises
EB	Ethics Board
EC	European Commission
ECE	Economic Commission for Europe
ECF	European Cyclists' Federation
ECTRI	European Conference of Transport Research Institutes
EDF	European Disability Forum
ERTRAC	European Road Transport Research Advisory Council
EU	European Union
EV	Electric Vehicles
FMEA	Failure Mode and Effects Analysis
GA	Grant Agreement
GDPR	General Data Protection Regulation
HMI	Human-Machine Interaction
IoT	Internet of Things
IPR	Intellectual Property Rights
IT	Information Technology
ITF	International Transport Forum
ITS	Intelligent Transport Systems
JRC	Joint Research Centre
Km	Kilometre
KPIs	Key Performance Indicators
L	Level
LaaS	Logistics as a Service
LoS	Letter of Support
MaaS	Mobility as a Service
MoU	Memorandum of Understanding
N/A	Non Applicable
NDA	Non-Disclosure Agreement
OECD	Organisation for Economic Co-operation and Development

Abbreviation	Definition
OEM	Original Equipment Manufacturer
ORDP	Open Research Data Pilot
PB	Partner Board
PC	Project Coordinator
PCG	Project Core Group
PDB	Project Demonstration Board
PERT	Project evaluation and review technique
PMT	Project Management Team
PO	Project Officer
POPD	Protection Of Personal Data
PPP	Public Private Partnership
PRM	Person with Reduced Mobility
PRT	Personal Rapid Transit
PT	Public Transport
PTA	Public transport authorities
PTD	Prior to Delivery
PTO	Public transport operators
QM	Quality Manager
QCB	Quality Control Board
QMR	Quarterly Management Reports
QoS	Quality of Service
RP	Reporting Period
SAE	Society of Automotive Engineers
SDK	Software development kit
SME	Small Medium Enterprise
SoA	State-of-Art
SP	Subproject
SULP	Sustainable Urban Logistics Plans
SUMP	Sustainable Urban Mobility Plans
TMC	Traffic Management Centre
UC	Use Case
VRU	Vulnerable Road Users
WBS	Work Breakdown Structure
WP	Work Package
WPL	Work Package Leader

1. Introduction

1.1 Purpose and structure of the document

This Deliverable is a second update of the D14.1 submitted in M3 of the project and followed by the first update provided in D14.4 submitted in M18.

This Deliverable defines the project governance, roles, responsibilities and processes in SHOW Consortium and describes different protocols and standards that will ensure the efficient workflow and communication amongst its participants.

Being a large project with a set of diverse experts from different fields and backgrounds, a core principle guiding internal processes is open participation and flexibility. Transparency about the project status is an additional principle that the project partners are committed to.

In order to ensure an efficient and timely implementation of the planned activities of SHOW's multidisciplinary team, we have defined and agreed on certain communication mechanisms and procedures, which will enhance the management and coordination of the project.

In addition to this deliverable, the project is also guided by important reference documents, which define the contractual objectives, the work plan and the operational procedures of the SHOW project. These documents are as follows:

- The SHOW Grant Agreement including its Annex I (Description of Action), Annex II (Estimated budget for the action), Annex 3 (Accession Forms), Annex 4 (Model for the financial statements), Annex 5 Model for the certificate on the financial statements and Annex 6 (Model for the certificate on the methodology)
- The Consortium Agreement (CA) as signed by all beneficiaries.
- Guidance documents provided by the European Commission, i.e.: Annotated Model Grant Agreement.

To sum up, the objectives of this Deliverable are the following ones:

- To update the information that has changed since D14.1, and D14.4
- To remind (based on D14.1, and D14.4):
    - the procedures and standards to be used in the SHOW project.
    - the management structure and key roles and responsibilities.
    - how the project will be carried out, measured, monitored, accounted for and safeguarded during the project.

These objectives are covered within the following chapters and appendixes of this deliverable:

Chapter 1 of the deliverable. which introduces the purpose of the document, the intended audience and the interrelations, **Chapter 2**, which presents the essential info about the SHOW project (vision, aim, objectives, key innovation and expected impacts), **Chapter 3**, which provides the key project features and work plan, **Chapter 4**, which elaborates on the project governance (layers, bodies and roles), **Chapter 5**, which details the key project management processes, **Chapter 6**, which includes the quality assurance policy and processes of the project, addressing also the Deliverables peer review process and **Chapter 7**, which describes the risk management approach of the project.

Moreover, **Appendix I** provides the SHOW Deliverable template, **Appendix II** provides the peer review plan for the Deliverables, **Appendix III** the form for the risk assessment process of the project, **Appendix IV** the internal reports template, **Appendix V**, the

consolidated peer review template, **Appendix VI** the meeting agenda template, in **Appendix VIII** the project meeting minutes template is provided, and in the last two Appendices, the forms for issuing request and decision on request for Corrective Actions are provided.

1.2 Intended audience

The main target group for this Deliverable is the Consortium partners themselves as this document defines the project internal processes for securing smooth overall management and internal communication performance. It serves as a reference document for all project team members and may be especially helpful for individuals or organizations joining in the project at a later stage. Each project beneficiary must ensure that every project team member is aware of the provisions of this document.

1.3 Interrelations

The current Deliverable is cross-cutting to the whole project work plan, as the activities described herein are referring to horizontal governance principles and mechanisms.

2. About the SHOW Project

The project 'Shared automation Operating models for Worldwide adoption' (SHOW) aims to support the migration path towards affective and persuasive sustainable urban transport, through technical solutions, business models and priority scenarios for impact assessment, by deploying shared, connected, cooperative, electrified fleets of autonomous vehicles in coordinated Public Transport, Demand Responsive Transport, Mobility as a Service and Logistics as a Service operational chains in real-life urban demonstrations in 5 Mega, 6 Satellite and 3 Follower Pilots (in addition to 9 Follower Sites resulted from an Open Call for Follower Sites launched in December 2021) taking place in 20 cities across Europe.

By deploying a fleet of at least 70 L4/L5 Autonomous Vehicles (AVs) of all types (buses, shuttles, pods, robo-taxis, automated cars connected with MaaS and cargo vehicles) and for all transport operators (passengers, cargo and mixed transport) in both dedicated lanes and mixed traffic, connected to a wide range of supporting infrastructure (5G, G5, IoT, etc.) and operating under traffic speeds ranging from 18 to over 50km/h, it aims to satisfy 3 UCs families and 17 single UCs[1]; that together cover all urban automated mobility needs and wants of the stakeholders (i.e. as reported within SPACE initiative and in ERTRAC roadmap).

Project pilots will last for 24 months, with real service seamless operation in each pilot site lasting at least 12 months and will transport with AV fleets over 1,500,000 passengers and 350,000 units of goods.

Being the bigger and more holistic ever real life Cooperative Connected Automated Vehicle (CCAV) urban demonstration initiative, it is user led (by UITP) and realised by a Consortium of 69 Partners, 10 linked third parties[2] and with the additional support of 60 stakeholders (connected through Letter of Support, including major stakeholder Associations) and twinning actions with 11 organisations the US, Japan, South Korea, Australia, China, Taiwan and Singapore.

2.1 Vision

SHOW vision is to support the deployment of shared connected and electrified automation in urban transport chains through demonstration of real-life scenarios to promote seamless and safe sustainable mobility.

SHOW project aims to support the migration path towards affective and persuasive sustainable urban transport through technical solutions, business models and priority scenarios for impact assessment, by deploying shared, connected, electrified fleets of autonomous vehicles in coordinated Public Transport (PT), Demand Responsive Transport (DRT), Mobility as a Service (MaaS) and Logistics as a Service (LaaS) operational chains in real-life urban demonstrations all across Europe.

2.2 Objectives and KPIs

SHOW objectives and related Key Achievement Indicators (KAIs) and Key Performance Indicators (KPIs) are described in Table 1.

[1] Since the proposal phase, the Use Cases have been updated and described in *D1.2 SHOW Use Cases*, submitted on M09 with a revision on M13

[2] Subject to change with the on-going Amendment procedure (status June 2022)

Table 1: SHOW Objectives, KAIs and KPIs (updated).

No.	Objective description	Key Achievement Indicators	Key Performance Indicators
1	To identify and specify priority urban automated mobility Use Cases (UCs) that guarantee high user acceptance, true user demand and cost-efficiency under realistic operation conditions; respecting the legal, operational and ethical limitations. - Subproject (SP)1	3 UCs families, 17 single UCs to work upon, each covered in at least one pilot site; all meeting local stakeholder interest and acceptance.	• **A5**: Operative costs • **A8:** Traveller acceptance • **A9:** Number of UCs success • **A10:** Realisation of each UC • **B48**: User reliability perception. • **B49**: User safety perception.
2	To identify novel business roles and develop innovative business models and exploitable products/services for sustainable automated fleet operations in urban and peri-urban environments. – SPs1 & 4	At least 7 existing (best practices) or novel AV deployment business models to be fully defined, including at least 2 new business roles; 5 models fully tested across the pilot sites.	• **A5**: Operative costs • **A11**: Number of novel business models created and tested • **A13**: Number of MoUs for services sustainability created between various stakeholders at SHOW or new follower cities • **A14**: Number of business models adopted that promote strategic partnering opportunities for local synergies • **B32**: Operative revenues.
3	To develop an open, modular and inclusive system architecture and the enabling tools for it; that supports all UCs and allows for cross-site, cross-vehicle and cross-operators data collection, analysis and meta services realisation. – SP2	Agreed System Architecture framework, able to be instantiated in each pilot site. SHOW Dashboard, big data collection platform and data management portal; able to collect and analyse all pilot site data. Big data analysis and AI algorithms leading to at least 5 AI new metadata services (on fleet operation or vehicle performance). Services Marketplace able to provide all operational, energy management and dynamic personalized services required at each site.	• **A12**: Number of SMEs using the SHOW marketplace
4	To improve the necessary functionalities to all vehicle types (shuttles and pods, buses and cars) to allow the demonstration UCs to	Fleet of over 70 EVs of all types (bus, shuttles, pods, cars), able to support the pilot sites according to the relevant UCs of WP1 and	• **A3:** Person km travelled by special groups • **A15:** SHOW deployed fleets

No.	Objective description	Key Achievement Indicators	Key Performance Indicators
	be realized, taking into account the local physical and digital infrastructure (5G, G5, …), weather and traffic conditions, improving their energy efficiency and safeguarding the safety of vulnerable and non-connected traffic participants through appropriated interfaces. – SP2	operational/ business scenarios of WP2 in a safe, secure and Legal/ethical manner and all required enabling infrastructure available at each site.	• **B25:** Energy use • **B49**: User safety perception.
5	To deploy demonstration fleets, infrastructure elements and connected services (DRT, MaaS, LaaS, etc.) to realise and validate seamless, personalized and shared electric Cooperative Connected Automated Vehicle (CCAV) services for all travellers in real urban and peri-urban traffic environments across Europe and, through a vast international collaboration at global level. – SP3	14 project sites[3] (5 Mega, 6 Satellite, 3 Follower), with 20 connected cities; transporting around 1500000 citizens and 350000 tons of goods by AV fleets.	• **A2:** Number of passengers • **A7:** Number of cargo transported • **A15:** SHOW deployed fleets
6	To assess the impact at city level of shared automated cooperative and electric fleets through holistic impact assessment. – SP3	Able through WP12 pilot gathered objective and subjective data and WP10 Pilot simulations to estimate all above impacts at Pilot (micro) and city (macro) level.	**Pilots** • **A2:** Number of passengers • **A3:** Person kms travelled by special groups • **A4**: Empty vehicle km • **A6**: Ratio of average load • **A7:** Number of cargo transported • **B1**: Road accidents. • **B2**: Conflicts. • **B3:** Illegal overtaking • **B7:** Average speed • **B8:** Acceleration variance • **B9**: Number of hard braking events per kilometre. • **B10**: Non-scheduled stops per kilometre.

[3] The demonstration sites are subject to change with the on-going Amendment procedure (status June 2022)

No.	Objective description	Key Achievement Indicators	Key Performance Indicators
			• **B11**: Scheduled stops per kilometre. • **B12:** Service reliability • **B13**: Kilometres travelled • **B25:** Energy use • **B30:** Shared mobility rate • **B31:** Vehicle utilization rate • **B35:** Punctuality of deliveries • **B36:** Precision of deliveries • **B38:** Unit cost of delivery • **B39:** Load factor patterns • **B42:** Number of accidents on site • **B43:** Accidents in AV UFT facility • **B35:** Number of incidents involving vandalism in AV UFT facility • **B46:** Loss and damaged parcels in AV UFT facility • **B47:** Fair and equal access to AV UFT facility • **B54:** Use of automated driving functions **Simulation (WP10)** • **A1:** Safety Enhancements • **B14:** Average speed • **B15:** Average vehicle delay • **B16:** Vehicle stops • **B17:** Hard braking events in traffic • **B18:** Total intersection delay • **B19**: Total network travel time per vehicle type • **B20**: Modal split • **B21:** Total mileage • **B22:** Total network delay • **B23**: Average network speed

No.	Objective description	Key Achievement Indicators	Key Performance Indicators
			• **B24:** Number of trips • **B26:** CO2, PM, NOx emissions • **B27:** Concentration of pollutants • **B28:** Noise levels • **B29:** Amount of travel **User surveys and subjective methods** • **A8:** Traveller acceptance • **B33**: Job loss. • **B34**: Job gain. • **B37:** Customer satisfaction (logistics) • **B40**: Public acceptance. • **B41**: Willingness to pay for AV urban deliveries/logistics. • **B48**: User reliability perception. • **B49**: User safety perception. • **B50**: Travel comfort. • **B51**: Perceived usefulness. • **B52**: Willingness to pay. • **B53**: Willingness to share a ride.
7	To transfer the outcomes through proof of alternative operational schemes and business models to replication sites across Europe and beyond. – SPs3&4	At least 10 more Follower sites and 15 replication schemes across various project sites/cities; 3 of which with extra European sites. At least 5 successful business models recognized and their bankable versions for at least the project 5 Mega sites.	• **A11**: Number of novel business models created and tested • **A13**: Number of MoUs for services sustainability created between various stakeholders at SHOW or new follower cities • **A14**: Number of business models adopted that promote strategic partnering opportunities for local synergies • **A16**: Future AV fleets after SHOW • **A17**: Number of alternative infrastructure schemes
8	To support evidence-based deployment of	At least 20 replication guidelines and 3 training	• **B55:** Number of external collaborations

No.	Objective description	Key Achievement Indicators	Key Performance Indicators
	urban traffic automation, through replication guidelines, road-mapping, reskilling and training schemes for the future workforce, input to certification and standardization actions and policy recommendations. – SP4	courses for AV fleet operation and control staff. At least 100 operators trained at Pilot sites. Proposed Roadmap adopted explicitly by at least 5 relevant user, industry or city/operator Associations and 5 National Ministries of Transport.	• **B56:** Number of UCs obtaining financial support after project implementation.

2.3 Key Innovation

SHOW encompasses a high number of novelties but its **key innovation is its holistic and integrated approach**, as it:

- Brings automated operation to all levels of city mobility from fixed route PT to DRT, connected MaaS and LaaS.
- Supports all urban traffic environments, from dense city traffic to remote peri-urban areas and neighbourhoods, specific environments (University campus, hospital areas, business districts, cargo depot, link to key multimodal hubs as airport or rail station…).
- Takes into account the needs and wants of all citizens (around 1,5 millions of citizens in 20 cities and 13 countries being transported by AVs of all kinds during its demonstrations), with specific consideration and demonstrations for specific user clusters, such as tourists, commuters, the elderly, PRM, students, children.
- Encompasses all different vehicle types (autonomous buses, shuttles, robo-taxis, cars, cargo vehicles, etc.).
- Develops, applies and validates alternative business models for automated urban transport sustainability, resulting to optimal models per city and application – service type.
- Develops an open and modular architecture and tools that allow data collection across 14 European and 11 potential extra European sites; thus offering a unique data repository for big data analytics and metadata services development as well as for future data analyses for research purposes.
- Develops a 5G control tower concept and system for teleoperation and supervision with the aim to safely remove the operator from the vehicle to a remote operator in a control tower.
- Develops AI algorithms and advances services for prediction of demand for CCAV while accounting for uncertainty in the predictions (i.e. how confident the models are), multi-output machine learning models for spatio-temporally correlated movements and interfacing with demand-responsive optimisation of supply.
- Develops innovative energy management schemes allowing modelling & maximizing automated fleets abilities.
- By supporting multi-operators, multi vehicle types, multi UCs big Pilots in resolves key interoperability issues and results in recommendations for relevant operational, legal and standardization actions.
- Enhances the traveller experience (both of automated fleet passengers and the rest non-connected-traffic participants) by developing, applying and assessing

technologies and measures to enhance mutual conspicuity and the actual and perceived level of travellers' safety and security.

- Develops a comprehensive simulation framework and uses a set of tools to assess (a priori and a posteriori) the impacts of automated transport services deployment in cities.
- Develops a comprehensive impact assessment framework and quantified connected KPI's to assess the impact of mass automated services deployment in cities, in terms of safety, citizen acceptance, traffic efficiency, energy efficiency, cost efficiency, etc.
- Provides structured replication models for cities to follow and a DSS tool to select the best measures for them.
- Engages all the ecosystem community across Europe (vehicle OEMs and their suppliers, infrastructure operators, transport service operators, cities and regions, governments and authorities, research performers, citizen representing associations) at each pilot site level and cumulatively within the project in a unique effort to bring sustainable urban mobility through automation from a dream to a living reality.

2.4 Expected impact

SHOW is expected to be a Game Changer in the path of urban mobility automation. This is to be achieved through:

a) Becoming the bigger ever showcase and living lab for AV fleets by transporting **over 1500000 people and 350000 containers** of goods through a combined AV fleet of **over 70 vehicles** (bus, shuttle, pod, car) in **20 cities** across Europe.

b) **Setting the relevant Industrial standard**, by enrolling the vast majority of AVs OEMs and operators (13 in total) in a single project and in many case in the same Pilot site (i.e. Transdev and KEOLIS in French and Swedish sites); thus resulting in a commonly accepted open system Architecture, widely adopted standardisation and policy recommendations and de facto proven interoperability protocols.

c) **Involving the full value chain of autonomous PT mobility services throughout the project and in each of its Pilot sites.** Thus, 15 OEMs and operators liaise with 5 tier 1 and Telco providers, 10 local authorities, 8 value added services industries and 6 SMEs, as well as 23 Research and Academia representatives[4] (reflecting the highly innovative nature of the issue). Also, each Pilot site constitutes a PPP integrating one or more OEMs and operators with the local society (municipalities and other authorities) including all key actors of the value chain (as full partners, associate partners, sub-contractors or through LoS).

d) **Being truly Europewide.** With 5 Mega Pilots, 6 Satellite Pilots and 3 Followers (14 in total) all geographical areas, city sizes, weather conditions, socioeconomic and cultural issues are covered. Local differences will be met by specific UCs adaptation, varying technologies (i.e. C-ITS or 5G enabled) and different business models.

The project is expected to have a relevant impact at different levels as set by the Call DR-ART-04-2019 and described in the following table. The impact assessment of the project will be held in WP13: Impact assessment. The following table also reflects the mapping to the latest full list of KPIs defined.

[4] Number of entities in the Consortium may be subject to changes with the on-going Amendment procedure (status June 2022)

Table 2: Expected impacts as reflected in DR-ART-04-2019 vs SHOW (updated).

Expected Impact: Proposals will test the overall mobility impact, in particular, how shared mobility solutions using connected and cooperative automated vehicles can contribute to a more sustainable, inclusive, and safe mobility system and help residents of a city/region (in particular less mobile persons, elderly and children) to increase mobility and improve urban freight transport efficiency.
SHOW tests **coordinated shared mobility chains** across its sites. It includes in its Pilots automated PT (buses and metros), automated shuttles for DRT services and automated MaaS fleets for passenger transport; as well as AVs for pure cargo delivery and for mixed **passenger/ cargo transport**; at different times of day and concurrently –using different vehicle compartments. Especially, the UC1.10 of SHOW on "seamless autonomous transport chains of Automated PT, PRT, MaaS and LaaS" covers fully and in a very innovative way the Call aim. Services tested are **sustainable** since they are applied under specifically designed or adapted business models (from WP2) and constitute part of wider local urban mobility automation initiatives and schemes; with guaranteed reserved funds and agreed stakeholder timeframes. Operations in planned demonstrations are **safe** as vehicles' robust performance is validated and guaranteed either by their OEMs or at the JRC AVs proving grounds before being commissioned for demonstrations. Furthermore, since over 90% of accidents are due to drivers errors; the extended use of AVs is expected to enhance traffic safety in cities of tomorrow. Dieter Zetsche CEO of Daimler AG stated that *"1 Million lives will be saved each year with AV. Today we have 1 accident each 100000 Km. Avs will reduce it to 1 each 10 million km."* Still, although up to date, no accident involving an AV shuttle of the Consortium OEM's and Operators has occurred despite the millions of Km driven, when the speed and the complexity of the traffic context enhance, AVs may introduce new types of accidents. The pilot demonstrations may provide hinges on that through reported incidents and conflicts that can be projected within WP10 simulation. VRU's safety impacts are included and will be also assessed in SHOW, measuring their situational awareness with respect to AVs (do they see them? How and in which timeframe do they react? Do they understand the warning provided to them and is it correct what they understand vs what it was intended for them to understand?). Still, so far there is no relevant baseline existing. What is available is assumption based (i.e. from CoExist project) or it is applied for a totally different context (i.e. for visibility of fire brigade vehicles). The available findings, also those coming from the on-going AVENUE - will be studied in depth for their relevance and if found applicable will be used as baseline for our studies. **Secure services are also promoted**, with due emphasis in cybersecurity (A4.4), as well as by supporting the operation of AVs through remote supervision in most cases properly integrated within the city TMC (UC1.7 of SHOW); with interaction to all city authorities (police, fire brigade, ambulance, etc.). Also, the perceived notion of security will be tested, having SAE L4/L5 vehicles in Copenhagen and Brainport Pilot sites operating with a redundant driver on board; to assess the subsequent behaviour and acceptance changes.
KPI's & their targets: **GA KPIs:** • KPI.1: Number of SHOW UCs successfully deployed and tested in Pilots (out of the 22 listed in Section 1.3.1.2). Target: At least 15 UCs (out of 22) are fulfilled and successfully demonstrated (at least in one site each); • KPI.2: Realisation of each UC, under the pre-defined in Section 1.3 operational and functional requirements (in terms of environment, speed, itineraries, etc.) in total (across all Pilot sites). Target: Realisation of UCs across Pilots, according to their plans and specifications > 70%; • KPI.3: Number of citizen and cargo transported throughout the project per automated vehicle/ service type (PT, DRT, MaaS). Target: Number of citizens transported>1500000 / Number of cargo transported>350000 containers; • KPI.4: Traveller acceptance rating of services (overall and of each specific group encompassing VRU groups). Target: Traveller acceptance rating (1-9 scale) over 7 (mean value); • KPI.5: >% expected safety enhancement (WP10 simulations). Target: >10% (as PT/ DRT urban accidents are scarce); in specific for the VRU groups the target is >15% enhancement of VRU conspicuity by the AV; through better sensing techniques (upon

test results of A7.5: Interaction between cooperative and non-cooperative traffic participants) and >25% enhancement of AV conspiquity by the VRU, through better HMI (upon test results of A7.4: HMI & Control/Handover strategies);
- KPI.6: Person km travelled by special groups of citizens (elderly, PRMs, children) transported throughout the project per automated vehicles/ service type (PT, DRT, MaaS). Target: >20% person kilometres travelled by special groups (in total, 5% for each sub-group);
- KPI.7: Concerning freight transport efficiency in last-mile deliveries: ratio of the average load to total vehicle freight capacity; percentage of vehicle-km run empty and operative cost of the travelled kilometre. Target: load factors of vehicles up to 70%; Empty haulage 20% or lower; operative cost of the travelled km; at least a reduction of 20% before-after Pilots

Non-GA KPIs[5]:

- KPI B1: Road accidents. **Research question:** What is the number of accidents that caused even the slightest of injury during the operation of the AV?
- KPI B2: Conflicts. **Research question:** What is the number of number of conflicts with other road users and infrastructure during the operation of the AV?
- KPI B5: Lateral/longitudinal distances. **Research question:** What is the lateral/longitudinal distance between vehicles (km)?
- KPI B6: Lateral/longitudinal headways. **Research question:** What is the lateral/longitudinal headway between vehicles (seconds)?
- KPI B9: Number of hard braking events per kilometre. **Research question:** What is the number of hard braking events per km?
- KPI B10: Non-scheduled stops per kilometre. **Research question:** How often does a pilot vehicle have to make a non-scheduled stop?
- KPI B11: Scheduled stops per kilometre. **Research question:** How often does a pilot vehicle have to make a scheduled stop?
- KPI B13: Number of travellers. **Research question:** How many travellers have travelled in a pilot vehicle?
- KPI B17: Number of vehicle stops (WP10 simulation). **Research question:** How does the introduction of pilot vehicles impact the number of stop in traffic?
- KPI B18: Number of hard braking events in traffic (WP10 simulation). **Research question:** How does the introduction of pilot vehicles impact the number of hard braking event in traffic?
- KPI B20: Total network travel time per vehicle type (WP10 simulation). **Research question:** How does the introduction of the new mobility system affect the total network travel time?
- KPI B21: Modal split (WP10 simulation). **Research question:** How does the introduction of the new mobility system affect the modal split?
- KPI B24: Average network speed (WP10 simulation). **Research question:** How does the introduction of the new mobility system affect the average network speed?
- KPI B33: Operative revenues. **Research question:** What is the revenue from the AV services?
- KPI B34: Job loss. . **Research question:** What would be the proportion of jobs and the type of jobs that would be lost because of AV services?
- KPI B35: Job gain. **Research question:** What would be the proportion of jobs and the type of jobs that would be gained because of AV services?
- KPI B36: Punctuality of deliveries. **Research question:** What is the proportion of deliveries and pick-up executed within the planned (scheduled) delivery time?
- KPI B37: Precision of deliveries. **Research question:** What is the proportion of packages reaching their destination without being lost, stolen or damaged?
- KPI B38: Customer satisfaction**. Research question:** What is the perceived satisfaction of customers with the AV delivery or pick-up service?

[5] Defined in addition to the KPIs list existent in the GA, in the context of WP13.

- KPI B39: Unit cost of delivery**. Research question:** What is the average unit cost of delivery/pick-up service (per km, per shipment, per vehicle)?
- KPI B40: Load factor patterns. **Research question:** What is the volume that is occupied by packages?
- KPI B41: Public acceptance. **Research question:** What is the public willingness to use the system and trust to the system?
- KPI B42: Willingness to pay for AV urban deliveries/logistics. **Research question:** What is the maximum (and average) additional price users are willing to pay for AV service?
- KPI B43: Number of accidents on site. **Research question:** What is the number of accidents during the operation of the AV?
- KPI B44: Accidents in AV UFT facility. **Research question:** What is the number of damaged parcels caused by the accident during the operation of AV service?
- KPI B45: Incidents of crime / theft in AV UFT facility. **Research question:** What is the number of incidents involving crime or theft of parcel or any part of the AV device during its operation?
- KPI B46: Number of incidents involving vandalism in AV UFT facility. **Research question:** What is the number of incidents caused by vandalism during the operation of AV service?
- KPI B47: Incidents of crime / theft in AV UFT facility. **Research question:** What is the number of loss and damaged parcels caused in AV UFT facility?
- KPI B48: Fair and equal access to in AV UFT facility. **Research question:** What is the public perception of Fair and Equal access to the AV UFT facility?
- KPI B49: User reliability perception. **Research question:** What is the perception by passengers of the travel reliability in AV transit services?
- KPI B50: User safety perception. **Research question:** What is the perception by passengers of vehicle safety in AV transit services?
- KPI B51: Travel comfort. **Research question:** What is the perception by passengers of travel comfort in AV transit services?
- KPI B52: Perceived usefulness. **Research question:** What is the perception by passengers of usefulness of the journey in AV transit services?
- KPI B53: Willingness to pay. **Research question:** What is the willingness to pay for AV services?
- KPI B54: Willingness to share a ride. **Research question:** What is the user willingness and user factors to share a ride in an AV?

Actions to reach target: Deployment of SHOW UCs in 20 cities Europe-wide across 5 Mega, 6 Satellite and 3 Follower Pilots (further extended through aligning with more self-financed Follower sites/ cities in the project). Pilot sites integration to last 24 months; including at least 12 months real life seamless service operation.

Obstacles/barriers to achieve impact & Mitigation actions: *Regulatory barriers*: Operation in some areas or at higher speed might not be allowed due to existing or emerging legislation. **- *Mitigation:*** *Demonstrate non-legal functions operations in other sites (where it is legal) or through out-of-road demos and reduce the actual operation to the legal constraints. The fact that 5 Ministries have provided explicit support (by LoS) reduces this risk.;* ***Operation & policy barriers***: Local communities may changes policies and priorities (i.e. new mayor and city council), reducing local Pilot support and contributing budgets and delaying or cancelling necessary procurement activities. - ***Mitigation:*** *The existence of multiple sites (and even cities within Mega sites) fits also this purpose; in case delays or cancellations are met in one city/ site, other cities/ sites may bridge the gap with transfer of funding* ***; Technical barriers:*** Difficulties in achieving the required functions to support all prioritised SHOW UCs. - ***Mitigation****: With 3 UC families and 17 single innovative UCs, even if some may not succeed fully, the project's impact will be enormous.*

Expected impact: Proposed actions will help to reduce the total number of passenger cars and goods km in cities, overall CO_2 and air pollutant emissions and energy consumption.

As the number of cars in cities represents an urgent problem, the operation of automated cars in fleets as service (MaaS) could be an alternative to car-ownership and thus a measure to reduce the number of cars in cities without reducing the accessibility – a clear contribution to SUMP objectives. Studies like the OECD/ITF "Lisbon Study" clearly show the potential. In the recent study of McKinsey, about half of the expected benefits of automated cars come from the real estate sector through reclaiming space by "use it – don't own it". On vehicle

level, predictive speed profiling and predictive route management will reduce energy consumption (for pure-electric vehicles) and emissions (for conventional and hybrid vehicles) significantly. With the technology introduced, we are aiming at a reduction of 15% in terms of energy consumption reduction and 10% in emissions, respectively. Though there is no stable baseline research for the energy reduction on vehicle level, initial findings from CM2 Trikala Pilot imply (when adding the assumption of existence of baseline scenarios with conventional diesel vehicle that did not exist in reality though) an energy consumption reduction of approximately 35%. On city level, the overall number of vehicles on the roads will be remarkably reduced thanks to intelligent combination of smart PT solutions (conventional PT assisted by first-mile and last-mile mobility solutions realized through autonomous shuttles) and with individual mobility offering, by autonomous car sharing services. For example, the total number of passengers transported during the AVs demonstration in Trikala for CM2 was 12,138, with an average of 8.15 passengers per route. This indicates around 75% occupancy rate for the vehicle, as its capacity is 11 passengers (6 seated, 4 standing, 1 wheelchair user). In parallel, SocialCar project proved that using the RIDEMYROUTE app (the carpooling application developed by the project) carpooling will increase from 9% up to 19%, commuting trips would be reduced from 10% (in Zagreb) to 45% (in Edinburgh) and PT users would increase from 7% (in Zagreb) to 35% (in Brussels). This impacts global energy demands in many ways: Less vehicles on the roads means less traffic jams, thus improved traffic flow and less stop/go maneuvers which are energy-consuming and emission-relevant.; Less vehicles on the road means less vehicles to be produced, thus less energy used for vehicle production. According to SocialCar project results, carpooling has resulted in a CO2 emissions reduction and a fuel consumption decrease from 12,5% (in Brussels) to 50% (in Zagreb). In addition, results from the analysis of 4 different level-of-use scenarios (see below) in 6 municipalities of West Corso Francia showed that the overall emissions could be reduced from 1.1% up to 8.6% with 2 persons per carpool trip and from 1.9% up to 15.2% with 3 persons per carpool trip. The Annual car-km saved (in millions) could be from 2.82 up to 22.60, with 2 persons per carpool trip, and from 4.97 up to 39.80 with 3 persons per carpool trip. Car sharing, compared to individual vehicle ownership, means more effective utilization of the vehicle, thus less battery leakage and increased battery lifetime. There is not yet a stable baseline for PT quality-of-service (QoS) enhancement; the assessment is done based on a global model representing the current share of different vehicle types in the city which is then compared to a variety of alternative scenarios for smart transportation solutions. Depending on the mobility needs of the citizens, several solutions might be found which increase the QoS while maintaining the number of PT units, or which in turn maintain the present QoS with less PT units. For example, the estimates of STIB (50k passengers from 2020 to 2023 during the SHOW project) is actually in line with their first results of their first test launched in June 2019. In Trikala CM2 service, though again there was no direct measurement for the PT QoS enhancement per se, still the findings revealed that 9 out of 10 users (91%) thought it would be useful to implement the ARTS (Automated Rapid Transport System) service on a permanent basis in the City. Users rated the ARTS usefulness as more than Good (the weighted average of responses was 4.29 in a 1-5 Scale), while they rated the comfort in terms of seat availability, crowding, temperature and outside view as Good (weighted average was 3.95). The information provision was rated as almost Good (weighted average was 3.86). The respondents' satisfaction as regards the jerks, namely the harsh accelerations or decelerations of the ARTS, was again rated as almost Good (weighted average of responses was 3.91), while their satisfaction from the frequency of decelerations (number of times that the vehicle had stopped, additionally to stops and traffic lights) was a bit lower, although positive (weighted average was 3.45). Their satisfaction from the level of service, in terms of waiting time and on-board time, and from the ARTS integration with other transport modes, was again rather Good (the weighted average of responses was 3.59 and 3.57 respectively). The use of less vehicles, less Km per vehicle and the fact that the used vehicle fleets are all electric will significantly reduce the overall CO_2 and air pollution of the cities. Furthermore, the noise levels (especially in the low- and medium-speed range) will decrease heavily (up to 50%) in comparison to combustion engine vehicles; but even up to 30% in comparison to trams and trolleys that have noise inducing infrastructure. Tightly connected to that is heat reduction. Especially during summertime, buses are a source for heat for the city that adds to the climate warming effect and discomforts citizens. Electrified PT will greatly improve this. In addition, the optimisation of load factor and minimization of

loading energy requirements of FURBOT (UNIGENOVA) cargo AVs and others in the SHOW pilots may reduce freight delivery energy requirements up to 40%.

KPI's & their targets:

GA KPIs:

- KPI.8: % reduction in CO_2 and air polluted emissions, as well as noise levels. Target: 90% for CO2 at city level, 30% for noise
- KPI.9: % reduction in energy consumption, compared to existing conventional alternatives. Target: 20% for passengers transport, 40% for freight.
- KPI.10: % reduction in energy consumption, compared to non-use of SHOW energy management services. Target: 10%
- KPI.11: % increase in single vehicle kilometres travelled: shared mobility modes will increase the % of AV usage and therefore cut the number of parked vehicles, reducing land occupation. Target: 35% increase in AV kilometres travelled comparing to the average vehicle kilometres travelled before the Pilots.
- KPI.12: % increase in average vehicle occupancy: pooling strategies will increase AV occupancy rate and therefore cut the number of vehicles in use, reducing traffic levels and congestion. Target: increase of at least 25% for AVs in low density areas comparing to the average vehicle occupancy in the same areas before the Pilots
- KPI.13: % of PT QoS enhancement. Target: increase by 20% in terms of area coverage and by 10% in terms of time-to-target.

Non-GA KPIs:

- KPI B4: Traffic flow. **Research question:** What is the number of vehicles per km?
- KPI B7: Average speed. **Research question:** What is the average speed of pilot vehicles on the pilot route?
- KPI B8: Acceleration variance. **Research question:** How does the acceleration of pilot vehicle vary on the pilot route?
- KPI B12: Service reliability. **Research question:** How often did the pilot vehicle arrive/depart as scheduled?
- KPI B14: Kilometres travelled**. Research question:** How many kilometres did the pilot vehicle travel?
- KPI B15: Speed per vehicle type (WP10 simulation). **Research question:** How does the introduction of pilot vehicles impact the average speed for all vehicle types?
- KPI B16: Average vehicle delay (WP10 simulation). **Research question:** How does the introduction of pilot vehicles impact the average vehicle delay for all vehicle types?
- KPI B19: Total intersection delay (WP10 simulation). **Research question:** How does the introduction of pilot vehicles impact the vehicle delay on intersection?
- KPI B22: Total mileage (WP10 simulation).. **Research question:** How does the introduction of the new mobility system affect the vehicle kilometres travelled per mode?
- KPI B23: Total network delay (WP10 simulation). **Research question:** How does the introduction of the new mobility system affect the total network delay?
- KPI B25: Number of trips (WP10 simulation). **Research question:** How does the introduction of the new mobility system affect the number of trips performed? (e.g. caused by induced demand)
- KPI B26: Energy use. **Research question**: How does the introduction of the new mobility system change energy consumption of vehicles?
- KPI B27: CO_2, OM, NOx emissions. **Research question**: How does the introduction of the new mobility system change the amount of vehicle emissions related to transport in the area of interest?
- KPI B28: Concentrations (air quality). **Research question**: How does the introduction of the new mobility system affect the air quality in the area of interest?
- KPI B29: Noise level. **Research question:** How does the introduction of the new mobility system affect the traffic noise in the area of interest?
- KPI B30: Amount of travel (WP10 simulation). **Research question:** How would kilometres travelled by people in an area with shared AV services change?

- KPI B31: Shared mobility rate (WP10 simulation). **Research question:** What is the proportion of trips where the vehicle is shared between passengers not travelling together?
- KPI B32: Vehicle utilization rate. **Research question:** What is the proportion of time that the AV is not parked and how was the vehicle being used when in motion?

Actions to reach target: Data stemming from the Pilot sites, using the A4.1 system Architecture and A4.3 Dashboard. Analysis and extrapolation of data at city level through WP10 simulations. Fleets energy management efficiency enhancement through A6.4 tools.

Obstacles/barriers to achieve impact & Mitigation actions: ***Operation barriers***: In spite of significant fleets and long Pilots durations, the Pilots will not have a measurable impact at city level. - ***Mitigation:*** *Use of simulations (of WP10) to extrapolate the locally gathered data and user acceptance increase over time results from demonstrations (A13.5). However, in some smaller cities (i.e. Trikala) or specific areas (i.e. hospital/ University campuses) it can be expected to have a measurable impact in local traffic and CO_2/ air pollution levels.* ; ***Maturity bias barriers:*** When fully applied and mature, the Piloted services are expected to lead to modal shifts from passengers cars to PT or/and shared mobility means. However, this will not happen overnight and thus may not be reflected in Pilot gathered data. - ***Mitigation****: The long duration of Pilots and the citizen familiarisation during the pre-Pilot period will allow such trends to surface even during the project.*

Expected impact: They will improve market opportunities for SME's and new-entrants by addressing and developing innovative cross-sector business models.

SHOW aims to analyse existing and emerging best practice business models, as well as develop and apply novel ones at each of its Pilot sites (WP2). Even if the same model is applied in two cities, its relevant parameters, fee levels, stakeholder groups, etc. will differ. Also, new business roles (i.e. of AV services aggregator) and even game changing concepts (AaaS – Automation as a Service) are expected to emerge through project's work. The development of an open System Architecture and a supporting dashboard in WP4 will allow SMEs to get access to a rich set of data to realise their added value services. A whole WP (WP6) is devoted to exploring such opportunities and creating a Marketplace in the form of an open community, algorithms and tools to allow SMEs (primarily) and Industries to develop and deploy cross-side and pan-European services for AV fleets and autonomous urban mobility applications.

KPI's & their targets:

GA KPIs:

- KPI.14: Number of novel business models created and tested. Target: > 5
- KPI.15: Number of SMEs (internal and external to the project) that will use the SHOW services Marketplace to develop services (during project's duration). Target: > 3 internal, 15 external.

Non-GA KPIs:

KPI B57: Number of UCs obtaining financial support after project implementation. Target: 40% of UCs tested

Actions to reach target: Through the project's System Architecture and the SHOW dashboard, real service data will be aggregated across the sites. The big data and AI toolboxes of A5.2 will allow their metadata analyses. A big part of these data and tools will be open to third party service providers (mainly SMEs) to allow services creation. The project has already conducted 1 Ideathon, and 1 Hackathon, which will be followed by 2 additional Ideathons and 2 Hackathon during its course, the first one already being organised; in order to inform and train the local site providers' communities (as well as relevant pan-European developer groups) on the emerging opportunities and guide them towards added value services requested by Pilot sites and other stakeholder communities. They will be also allowed to be offered during SHOW pilots, under their developers' responsibility and conditions.

Obstacles/barriers to achieve impact & Mitigation actions: ***Legal and operational constraints***: Both service operators and OEMs are not willing or even legally able to provide access to a series of data both for commercial interest and for security of service reasons. - ***Mitigation:*** *Nevertheless, several data on O-D and routes, transported volumes, citizens'*

expectations and experience feedback, etc. will be made public through the project's marketplace; leading to many valuable data and metadata pools for third parties (mainly SMEs). Which data will be opened has been defined in the project's Data Management Plan (D14.2) on M06 and in Data Management Plan final version (D14.3) in M27.

Expected impact: Actions will create strategic partnering opportunities between public agencies and the private sector for developing sustainable and scalable business models.

SHOW Pilots constitute already strategic Partnerships; involving in each one the local Municipality and/ or transport operator(s), the vehicle OEMs, local traffic infrastructure developers, service providing SMEs and Industries and local Integrators/ Research Performers. Thus, PPP collaborative schemes provide the governance and are de facto developed in each Pilot site. The role of IT infrastructure operators, is also an important business player (e.g. ERICSSON in Sweden, SIEMENS[6] in Austria, T-Systems in Germany). Such business models will be proposed in WP2, tested at Pilots and evaluated in A16.3. Their transferability to other cities/ sites will be performed within A12.7. Furthermore, A17.2 is analysing the "urban dimension" - impact of the SHOW demonstrators on SUMP and explicit call 4-10 criteria and further potential by upscaling in Delphi method and cross-site comparisons. SUMP scenarios will present interaction between automation and framework setting in urban and regional (spatial) planning, street design, fiscal and legal framework.

KPI's & their targets:

GA KPIs:

- KPI.16: Number of MoUs for services sustainability created between various stakeholders at SHOW or new Follower cities. Target: >15
- KPI.17: Number of business models adopted that promote strategic partnering opportunities and are multi-actor based. Target: > 3 Actions to reach target: Relevant business models are instantiated per site in A2.3

Non-GA KPIs:

KPI B56: External joint collaborations with third parties. **Research question**: What is the number of external partnerships achieved during the number

Actions to reach target: Relevant business models are instantiated per site in A2.3 and extended to followers in A12.7. Also, the developed services at each site will be correlated to current SUMP methodologies and city plans (in A17.2) and lead to specific recommendations for local synergies.

Obstacles/barriers to achieve impact & Mitigation actions: ***Lack of full ecosystem at local level***: A city/ country may lack local OEMs, IT industries or other key stakeholders to fulfil the optimal strategic partnership; thus follow the best business model. - ***Mitigation:*** *The project brings cities and other authorities and operators from all across Europe with Europe-wide strategic players (AV OEMs and big AV fleet operators, Tier 1 suppliers, Telcos and other big IT industries); thus allowing those that lack appropriate local partnerships to formulate/ negotiate such with big players.*

Expected impact: They will also support the accelerated deployment of electrified vehicles for shared automated mobility services and integrated strategies for a smart and multi-modal mobility system and urban development, including land use and ITS and infrastructure development.

SHOW will be a real thrust in AVs' deployment acceleration in Europe, since it will create - through 20 connected cities from 13 countries 74 automated vehicles of all kinds and an estimated 1500000 transported passengers and 350000 cargo units – the critical mass and the reference cases across Europe. All its AV fleet constitutes of electric vehicles; the management operation and charging models being part of the project's Pilots. Multi-modal mobility is strongly facilitated by staring or ending Pilot journeys in major multimodal hubs (airports, train and metro stations), as well as by automating fleets of different characteristics in each Pilot site (busses, shuttles and people movers, private cars as MaaS fleets). Link to land use is performed within A17.2 and A17.3; linking to project's findings, business models and recommendations to local SUMP/ SULP, as well as elements of future SUMP/ SULP

[6] The ITS activities of Siemens Mobility Austria GmbH was transferred to Yunex Traffic Austria GmbH. This change has been communicated to the PO and has been integrated in Amendment #2 of the GA.

creation, in order to incorporate optimally automation related services in them. ITS infrastructure development plans are strongly supported by the SHOW Pilots, as all different automation enabling infrastructure types are used and comparatively tested in different or even within the same site (C-ITS, IoT, 4,5 to 5G, etc.); allowing to each city ecosystem to include in its business model the most appropriate for its infrastructure status and future development plans. The whole process will conclude in bankable exploitation and business plans per site, to be issued within WP16.
KPI's (GA) & their targets: • KPI.18: Number of SHOW deployed fleets remaining at service after project end. Target: > 50 vehicles in at least 10 Cities • KPI.19: Number of AV fleets planned to be deployed within 3 years after the project by SHOW sites and liaised followers (with relevant funding secured). Target: > 200 vehicles • KPI.20: Number of alternative infrastructure schemes to support deployment. Target: > 3 different schemes
Actions to reach target: Alternative ITS infrastructure solutions will be surveyed within WP8 and deployed at Pilot sites (in several multiple ones) depending on the part of the journey, as well as for comparison of performance and cost). Land use will be covered in A17.2 scenarios and correlated to local SUMP/ SULP. Both parameters will be related to the proposed/ assessed business models per site (WP2). Also, in A17.2, future deployment schemes of big fleet and infrastructures will be correlated to each site business plans, SUMP and SULP. Finally, relevant evidence-based correlations will be included in the DSS of A17.3.
Obstacles/barriers to achieve impact & Mitigation actions: *Lack of enabling infrastructure*: If a site has no plans to deploy 5G in the near future or C-ITS deployment scheme, it might be difficult to deploy AV fleets. - ***Mitigation:*** *The project will couple sites with relevant Telco and infrastructure providers to find solutions through shared resources and PPP schemes, as well as novel business actors/ models; such as outsourcing operations to an AaaS vendor. The local SME community will also be supported to make apps to promote accurate satellite-based services and promote use of distributed sensor networks (IoT or others).*

The full KPI's list is described in deliverable *D9.2: Pilot experimental plans, KPIs definition & impact assessment framework for pre-demo evaluation.*

3. Project features and work plan

3.1 Grant Agreement

The Grant Agreement (GA) for SHOW has been signed by all partners and the European Commission. It is accessible on the Cooperation Tool and in the EU Portal Funding & Tender Opportunities.

The GA is composed of the following reference documents (not referring to amended GA):

Table 3: Grant Agreement overview.

Page No.	Chapters	Description
Page 7	Terms & Conditions	Official EU rules, rights and obligations under the project
Page 89	Annex 1	Description of the Action (DoA) PART A contains the work plan (description of the work packages, deliverables, milestones, etc.) PART B is the text of the proposal (detailed description of how the consortium will complete the work plan)
Page 629	Annex 2	Estimated budget for the action
Page 639	Annex 3	Accession Forms (partners' signatures)
Page 709	Annex 4	Model for the financial statements and audit certificates
Page 710	Annex 5	Model for the certificate on the financial statements
Page 735	Annex 6	Model for the certificate on the methodology

3.2 Subprojects and Work Packages

SHOW is built around four (4) cascading phases called Subprojects (SP):

1- **SPI: Use Cases s and Business Scenarios**
2- **SPII: System architecture, technologies and tools**
3- **SPIII: Evaluation, demonstration and impact assessment**
4- **SPIV: Horizontal Issues**

It consists of 18 closely interrelated WPs, as shown in the Pert chart below.

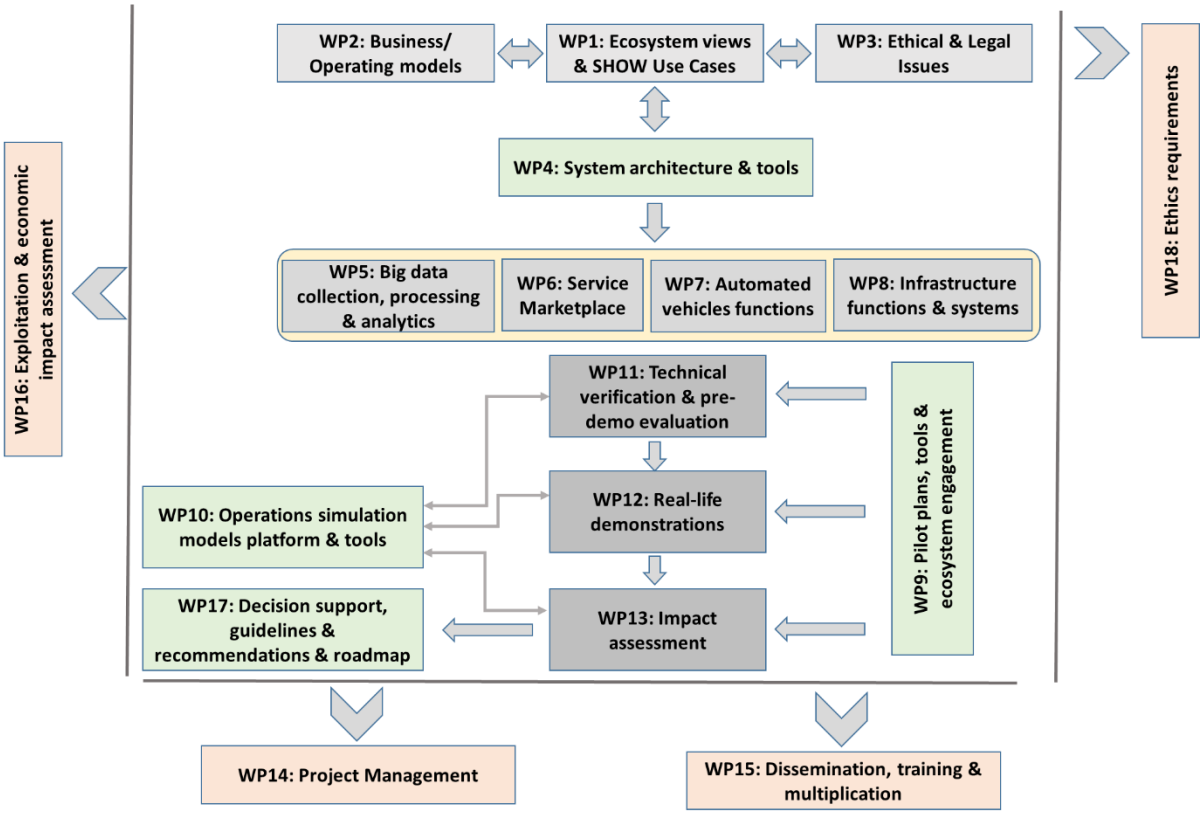


Figure 1: SHOW PERT chart.

The Work Packages of SHOW and Work Package leaders are listed below. In each case, a proxy has been defined. Start and end month for each are defined in the Gantt Chart following.

Table 4: SHOW Work Packages (WPs) and WP leaders.

SP/ WP No.	SP/WP title	Lead beneficiary entity	Lead physical person	
SPI	**Use Cases and Business Scenarios**	**Leader: CERTH/HIT Subleader: ATE**	**Leader: Maria Gkemou Subleader: Alexander Fürdös**	
WP1	Ecosystem views & SHOW UCs	2 – CERTH	Maria Gkemou	
WP2	Business / operating models	42 – IESTA	Jörg Worschech	
WP3	Ethical and Legal Issues	54 – ATE	Alexander Fürdös	
SPII	**System architecture, technologies and tools**	**Leader: NAVYA Subleader: ICCS**	**Leader: Pierre Chehwan Subleader: Anastasia Bolovinou**	
WP4	System architecture & tools	57 – ICCS	Anastasia Bolovinou	
WP5	Big Data collection, processing and analytics	2 – CERTH	Josep Maria Salanova Grau	
WP6	Services Marketplace	2 – CERTH	Konstantinos Votis	
WP7	Automated vehicles functions	4 – NAVYA	Pierre Chehwan	

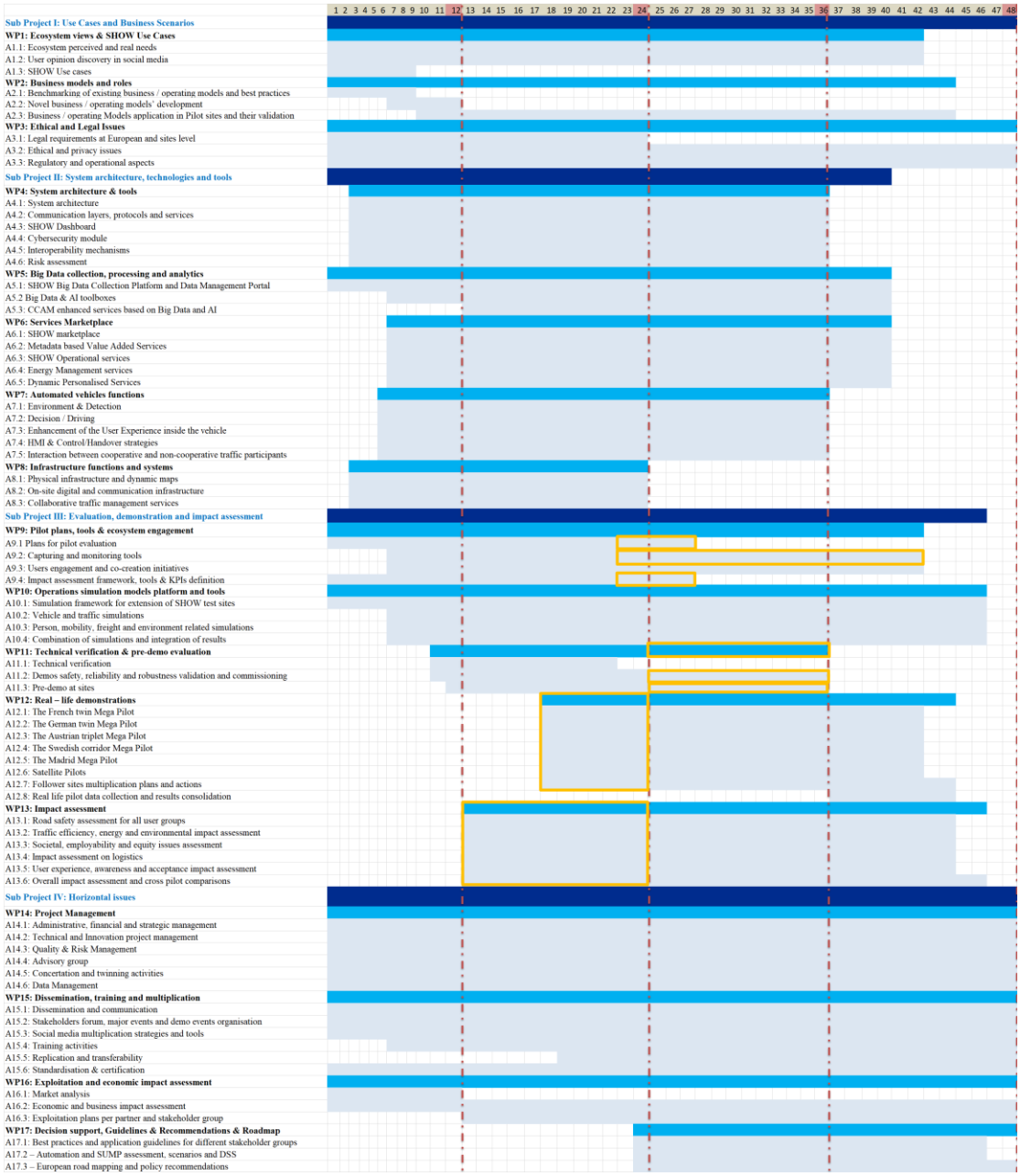
SP/ WP No.	SP/WP title	Lead beneficiary entity	Lead physical person	
WP8	Infrastructure functions and systems	55 – AIT	Christian Stefan	
SPIII	**Evaluation, demonstration and impact assessment**	**Leader: TNO Subleader: VTI**	**Leader: Tariq van Rooijen Subleader: Anna Anund**	
WP9	Pilot plans, tools & ecosystem engagement	49 – VTI	Anna Anund	
WP10	Operations simulation models platform and tools	68 – VIF	Joachim Hillebrand	
WP11	Technical verification & pre-demo evaluation	56 – IDIADA	Jordi Pont	
WP12	Real – life demonstrations	21 – EUROCITIES	Peter Staelens	
WP13	Impact assessment	52 – VUB	Evy Rombaut	
SPIV	**Horizontal Issues**	**Leader: UITP Subleader: ERTICO**	**Leader: Henriette Cornet Subleader: Nikolaos Tsampieris**	
WP14	Project Management	1 – UITP	Henriette Cornet	
WP15	Dissemination, Training and Multiplication	3 – ERTICO	Nikolaos Tsampieris	
WP16	Exploitation and economic impact assessment	19 - T-Systems	Ralf Willenbrock	
WP17	Decision support, Guidelines & Recommendations & Roadmap	21 – EUROCITIES	Peter Staelens	
WP18	Ethics requirements	1 – UITP	Henriette Cornet	

The time plan timing (Gantt Chart) of the project has been updated to reflect more accurately the actual progress and planning of it, as depicted in Figure 2.

In comparison with D14.1 and the Grant Agreement, two WPs started earlier[7]:

- WP12 has started on M18
- WP13 has started on M13

[7] Amendment #1



Yellow boxes are starting and ending dates extension.

Figure 2: SHOW Gantt scheme (updated).

SHOW piloting and demonstration plan consists of **five (5) distinct phases**, namely:

- **Licensing/Authorisation**, where the respective permissions, if required, for real-life demonstrations are acquired,
- **Technical validation**, that are held either in OEM's and other site labs and/or at JRC site at Ispra,
- **Pre-demo evaluation (1st Pilot round),** that all intended demonstration is operated for the first time in context and in real traffic but with no passengers (representatives internal to the Consortium from demo sites will participate in this phase), aiming also to serve as a rehearsal for the coming phase in all aspects (evaluation and impact assessment protocol, solutions performance and user acceptance),
- **Real-life demonstration (2nd pilot round)**, where the real-life demonstrations will take place in the demo sites endorsing the optimised as of the previous phase

solutions and protocols, for a series of months and according to the specific plan of each test site and,

- ***Post-demo services replication**, where the SHOW solutions will be replicated in the follower sites – internal and external to the project – on City and region level (specific activities in the project work plan are dedicated to this cluster of actions).*

The **Technical Validation** and **Pre-demo evaluation** phases encompass in their duration the optimisation that is required before moving to the next phase, while the **Real-life demonstration** phase encompasses the data collection part that is expected to start around 2-3 months after the launch of each real-life operation, to ensure stabilised and smooth process.

SHOW defines a validation and commissioning framework to be implemented for all demonstrations planned in Mega and Satellite sites, regardless of each site's traits. It follows an integrated approach including functional safety, safety performance and security, application to vehicles, infrastructure and supervision systems. There is a 2 level approach: 1) "Market deployment" level – commercial deployment oriented; 2) "SHOW deployment" level – to ensure the quality of the pilot operation and outcomes in the scope of the project. Focus is mainly on procedures, not in technical results; each provider ensures the achievement of the defined level. Confidential information under Intellectual Property Rights (IPR) is specially considered and protected. Validation tests are performed by each provider (e.g., fail-operational) of the demo sites and/or in cooperation with JRC at Ispra site. The demonstration plans are equally based on a common parametric evaluation framework that respond to the fulfilment of a minimum common set of KPI's defined for the impact assessment phase.

The SHOW Demonstration Plan (Figure 3) has been updated in D14.4 because of delays for obtaining licensing and authorisation on vehicles and city permits level, that are in turn have been heavily affected by Covid-19 and the subsequent restrictions in several aspects (working routines, bureaucratic processes, mobility of any type, supply chains, financial crises on local or broader level, etc.). Still, the overall plan is not affected, as the licensing is secured to have closed before the pre-demo launch in all sites, which in the vast majority of the cases were launched for all test sites in 2021[8].

Consequently, the Technical Validation and the Pre-demo evaluation phases have been extended in D14.4 to enable all sites to be ready for the real-life demonstration starting in M25[9], as it was originally expected, for those sites that will be ready to move on and the rest of the sites progressively joining.

[8] It is important to stress that the first pre-demo trials of the project have been indeed held in the first semester of 2021, whereas an advantage is that this phase and according to the evaluation protocol of D9.2 (Pilot experimental plans, KPIs definition & impact assessment framework for pre-demo evaluation) corresponding to the pre-demo phase and that has been submitted to the EC, the pre-demo phase can be held in a condense experimental way so as to meet all protocol requirements in order to shift as soon as possible to the final optimisation round and the real-life trials. In more specific, there is no duration criterion set for the pre-demo phase (as there is for the real-life one), as long as all criteria are met.

[9] The changes of the demonstration plan were presented to the PO during the Interim Review in July 2021

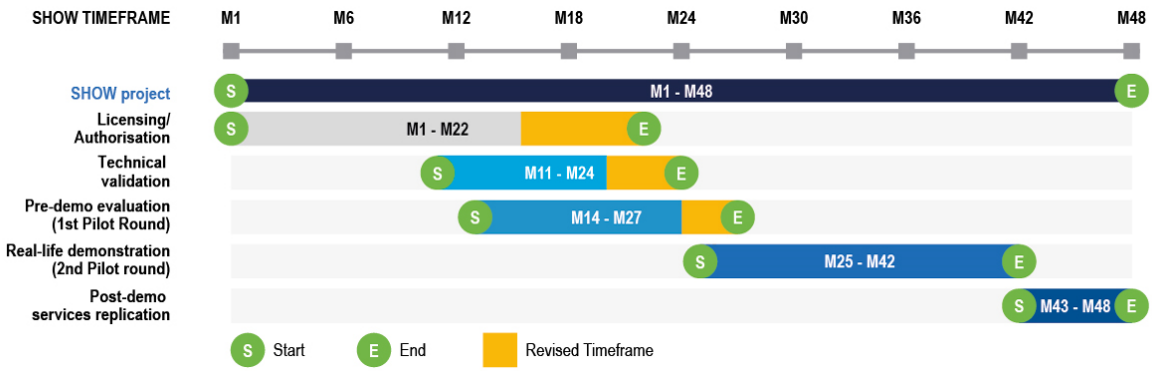


Figure 3: SHOW Demonstration Plan updated (yellow highlights reflect the shifts in relation to the original plan).

The location of the SHOW Demo sites is shown in the following figure.

Figure 4: SHOW Demonstration Sites (updated June 2022).

Some of the Demonstration Sites are pending approval: Crest, Frankfurt, and Monheim.

4. Consortium governance

4.1 SHOW Governance scheme

As mentioned before, SHOW project encompasses **69 partners**[10] and **18 interdependent Work Packages (WPs)** clustered under **4 Subprojects (SPs)**. Hence, it is important to establish a governance and management structure that is able to meet the challenges of a successful project implementation. It is designed in such a way in order to achieve the following goals:

- Lean structures and procedures for agile and cost-effective project management;
- Balanced distribution of activities & responsibilities among all partners;
- Efficient vertical and horizontal information flow, especially between Subprojects and Work Packages;
- Proactive conflict resolution mechanisms;
- Thorough assessment of potential risks involved;
- Optimal assignment of experienced personnel to the scientific, technical and managerial tasks.

The project structure (Figure 5) is defined as to allow reliable overall coordination, efficient communication, clear decision procedures, workflow giving rise to Deliverables meeting time and quality requirements, all performed in accordance to the European Commission Grant Agreement (GA) and the project Consortium Agreement (CA).

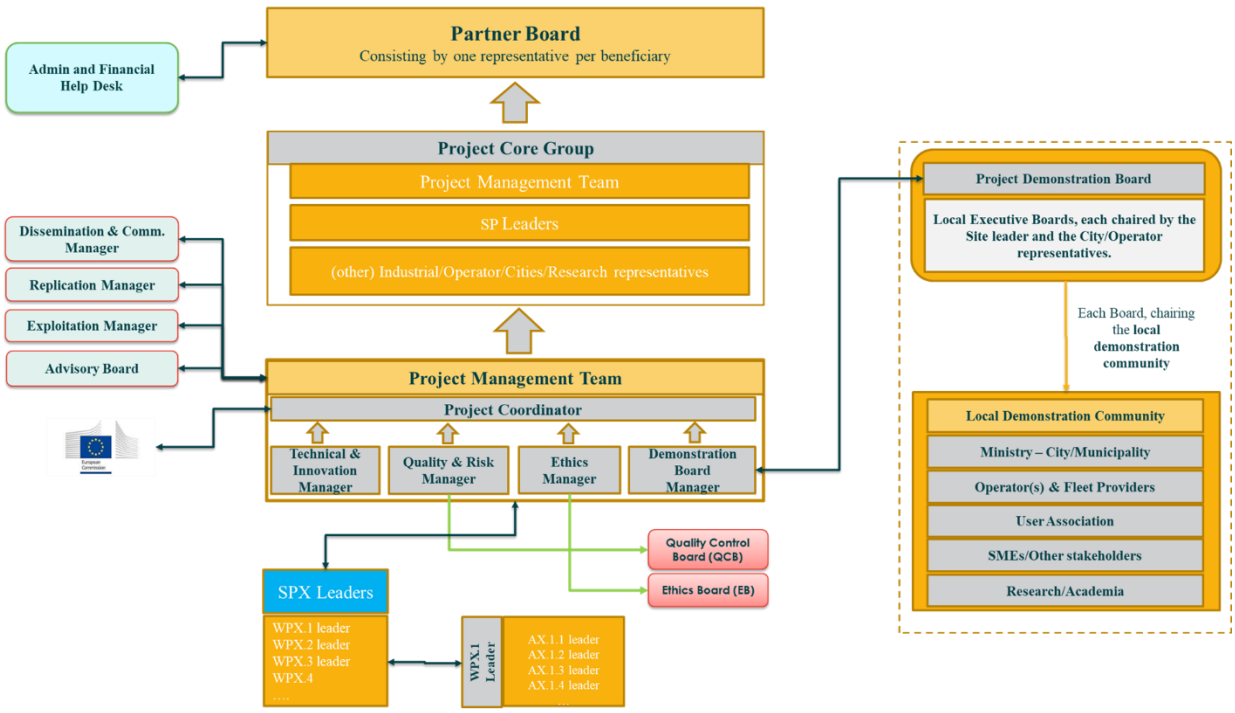


Figure 5: SHOW Project Management structure.

[10] Subject to changes with the on-going Amendment #2 procedure

4.2 The Consortium

The Consortium includes **34 Industrial entities** (15 OEMs and operators, 5 Tier-1 and telcos, 6 SMEs and 8 other industries) and **33 society related entities** (10 local authorities or their associations and other citizen engagement groups and **23 research performers**) as listed in the following table.

Highlighted in grey are the entities that have either expressed their intention to leave the Consortium (or the LTPs) or from whom the company name has changed. All changes are already included in Amendment #1, and in the on-going Amendment #2 procedure (status June 2022).

Table 5: The Consortium.

Type	Name	Short Name
Stakeholder representatives	UNION INTERNATIONALE DES TRANSPORTS PUBLICS	UITP
	EUROCITIES ASBL	EUROCITIES
	(LTP) CITY OF BREMEN	*CITY OF BREMEN*
	INTERNATIONAL ROAD FEDERATION	IRF
	EUROPEAN PASSENGERS' FEDERATION IVZW	EPF
	POLE DE COMPETITIVITE IDFORCAR	ID4CAR
	(LTP) GRUAU LAVAL SAS	*GRUAU*
	EUROPEAN ROAD TRANSPORT TELEMATICS IMPLEMENTATION COORDINATION ORGANISATION - INTELLIGENT TRANSPORT SYSTEMS & SERVICES EUROPE	ERTICO
Cities, authorities and users	STADT AACHEN	AACHEN
	(LTP) AACHENER STRASSENBAHN UND ENERGIEVERSORGUNGS AG	*ASEAG*
	TRAFIKSELSKABET MOVIA	MOVIA PTA
	BALLERUP KOMMUNE	BALLERUP
	ANAPTYXIAKI ETAIREIA DIMOU TRIKKAION ANAPTYXIAKI ANONYMI ETAIREIA OTA - E-TRIKALA AE	E-TRIKALA
	STATUTARNI MESTO BRNO	BRNO
	CENTRE HOSPITALIER UNIVERSITAIRE DE RENNES	CHU RENNES
	AUSTRIATECH – GESELLSCHAFT DES BUNDES FUR TECHNOLOGIEPOLITISCHE MASSNAHMEN GMBH	AUSTRIATECH
OEMs and Operators	NAVYA	NAVYA
	EASYMILE	EASYMILE
	TRANSDEV GROUP TRANSDEV GROUP INNOVATION	TRANSDEV TDGI
	(LTP) TRANSDEV SWEDEN	*TRANSDEV SWEDEN*
	(LTP) TRANSPORTS EN COMMUN DE L'AGGLOMERATION ROUENNAISE	TCAR
	(LTP) TRANSDEV NORMANDIE VAL DE SEINE	TNVS
	KEOLIS	KEOLIS
	KEOLIS SWEDEN	*KEOLIS SE*
	~~WIENER LINIEN GMBH &CO KG~~	~~Wiener Linien~~
	~~*(LPT) UPSTREAM-NEXT LEVEL MOBILITY GMBH*~~	~~*UPSTREAM*~~
	RHEIN-NECKAR-VERKEHR GMBH	RNV
	E.GO MOOVE GMBH	e.GO Moove GmbH
	(LTP) ZF FRIEDRICHSHAFEN AG	*ZF FRIEDRICHSHAFEN AG*
	(LTP) E.GO MOBILE AG	*E.GO MOBILE AG*

Type	Name	Short Name
	EMPRESA MUNICIPAL DE TRANSPORTES DE MADRID SA	EMT
	IRIZAR E-MOBILITY SL	IRIZAR
	(LTP) DATIK INFORMACION INTELIGENTE S.L.	*DATIK*
	SENSIBLE 4 OY	SENSIBLE 4
	SOCIETE DES TRANSPORTS INTERCOMMUNAUX DE BRUXELLES SSF	STIB
	Gruppo Torinese Trasporti S.P.A.	GTT
	PDCP GMBH	PDCP
	BAHNEN DER STADT MONHEIM	BSM
	BETI	BETI
	RHEIN-MAIN-VERKEHRSVERBUND SERVICEGESELLSCHAFT MBH (RMS) GMBH	RMS
	TRAFFIQ LOKALE NAHVERKEHRSGESELLSCHAFT FRANKFURT AM MAIN MBH (RMV FRANKFURT)	traffiQ
	ROBORIDE OY	ROBORIDE
Tier1 & Telcos	VALEO VISION SAS	Valeo Vision
	SIEMENS MOBILITY GMBH replaced by YUNEX TRAFFIC AUSTRIA GMBH	SIEMENS YUNEX
	ERICSSON AB	EAB
	(LTP) ERICSSON GMBH	*EAG*
	T-SYSTEMS INTERNATIONAL GMBH	T-Systems
	ROBERT BOSCH GMBH	BOSCH
	(LTP) ROBERT BOSCH CAR MULTIMEDIA GMBH	*BOSH CM*
Other Industry	KAPSCH TrafficCom AG	KTC
	AVL LIST GMBH	AVL
	(LTP) AVL SOFTWARE AND FUNCTIONS GMBH (AVL SW)	*AVL SW*
	FEV EUROPE GMBH	FEV EUROPE GMBH
	(LTP) FEV.IO GMBH	*FEV io*
	SWARCO MIZAR SRL	SWARCO MIZAR
	COMBITECH AB	COMBITECH
	OBJECTIVE SOFTWARE ITALIA SRL changed name to LUXOFT ITALY SRL	OBJECTIVE
	INDRA SISTEMAS SA	INDRA
	SITOWISE OY	SITOWISE
	IOKI GmbH	IOKI
SMEs	BESTMILE SA	BESTMILE SA
	EUROMOBILITA SRO	EUMO
	BAX INNOVATION CONSULTING SL	Bax & Company
	IESTA - INSTITUT FUR INNOVATIVE ENERGIE - STOFFAUSTAUSCHSYSTEME	IESTA
	ARTIN SPOL. S R.O.	ARTIN
	INFORMATION TECHNOLOGY FOR MARKET LEADERSHIP	ITML
	CTLUP SRL	CTLUP SRL
Research & Academia	ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS	CERTH
	JRC - JOINT RESEARCH CENTREEUROPEAN COMMISSION	JRC
	NEDERLANDSE ORGANISATIE VOOR TOEGEPAST NATUURWETENSCHAPPELIJK ONDERZOEK TNO	TNO
	STATENS VAG- OCH TRANSPORTFORSKNINGSINSTITUT	VTI
	INSTITUT VEDECOM	VEDECOM
	TEKNOLOGIAN TUTKIMUSKESKUS VTT Oy	VTT

Type	Name	Short Name
	VRIJE UNIVERSITEIT BRUSSEL	VUB
	RISE RESEARCH INSTITUTES OF SWEDEN AB	RISE
	AIT AUSTRIAN INSTITUTE OF TECHNOLOGY GMBH	AIT
	IDIADA AUTOMOTIVE TECHNOLOGY SA	IDIADA
	INSTITUTE OF COMMUNICATION AND COMPUTER SYSTEMS	ICCS
	FZI FORSCHUNGSZENTRUM INFORMATIK	FZI
	NATIONAL TECHNICAL UNIVERSITY OF ATHENS - NTUA	NTUA
	COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	CEA
	FUNDACION TECNALIA RESEARCH & INNOVATION	TECNALIA
	SALZBURG RESEARCH FORSCHUNGSGESELLSCHAFT M.B.H.	SRFG
	FONDAZIONE LINKS – LEADING INNOVATION & KNOWLEDGE FOR SOCIETY	LINKS
	DANMARKS TEKNISKE UNIVERSITET	DTU
	UNIVERSITA DEGLI STUDI DI GENOVA	UNIGENOVA
	CENTRUM DOPRAVNIHO VYZKUMU v.v.i.	CDV
	UNIVERSITE DE GENEVE	UNIGE
	VIRTUAL VEHICLE RESEARCH GMBH	VIF
	DEUTSCHES ZENTRUM FUER LUFT -UND RAUMFAHRT EV	DLR

In addition to the above beneficiaries, **SHOW** has **10 Linked Third Parties associated**[11] (indicated in Table 5 in italics) and a wide **associated supporting stakeholder ecosystem.** SHOW has engaged through Letters of Support/Commitment a long list of stakeholders. In specific: **18 Cities/Municipalities/Regions** [MobilitymoveZ.NL & City of Eindhoven (NL), Stadt Mannheim the Metropolregion Rhein-Neckar and the City of Mannheim/Chair of EUROCITIES Mobility Forum (DE), Region of Zealand & Capital Region of Denmark (DK), Municipalities of Trikala and Thessaloniki (GR), City Council of Madrid, Mobility Management and Technology (ES), the Development of Urban Environment and Infrastructure (FI), Region Normandie and Rennes Metropole (FR), the Turin City Council (IT), Linköping Municipality (SE), the Federal State of Salzburg, Directorate of Infrastructure and Transport, the Municipality of Koppl and the City of Vienna (AT)], **7 Ministries** [the Federal Ministry for Transport, Innovation and Technology for the Republic of Austria, the Czech Republic Ministry of Transport, the Finnish Ministry of Transport and Communications, the Mobility Management and Technology, Directorate General for Traffic Madrid and the Danish Ministry of Transport, Building and Housing, the Greek Ministry of Infrastructure and Transport and the Brussels Ministry of Mobility and Public Works], **12 Operators** [Konstantinos Mesimertsis, KTEL TRIKALON and Kouremenos Georgios S.A. (GR), Västtrafik AB (SE), Nobina Denmark, Copenhagen Metro and Autonomous Mobility A/S (DK), Hanseatische Fahrzeug Manufactur, Karlsruher Verkehrsverbund GmbH, Verkehrsverbund Rhein-Neckar GmbH and Verkehrsvertriebe Karlsruhe GmbH (DE) and Holding Graz - Kommunale Dienstleistungen GmBH and Österreichische Bundesbahnen (AT)], **9 Stakeholders** [DIGITAL CITIES OF CENTRAL GREECE, Anytime (Interamerican Property & Casualty Insurance Company S.A.), Vodafone Greece (GR), The Finnish Transport and Communications Agency (TRAFICOM), Hanseatische Fahrzeug Manufaktur GmbH (DE), the Salzburg Transport Authority, Business Ballerup (DK) and Città della Salute e della Scienza (Hospital Management Agency) in Italy], **12 Umbrella**

[11] Subject to change with the on-going amendment procedure (status June 2022)

Associations (CLEPA, ECTRI, EARPA, Y4PT, ALICE, EDF, AGE, European Cyclists' Federation, Information Technology for PT and Walk 21 in Belgium, VDV in Germany and AEVAC in Spain), **3 Cities that have pre-agreed for replication** (Málaga Municipality, City Hall of Palma de Mallorca and BKK Centre for Budapest Transport), and, finally, **11 entities around the world having pre-agreed in twinning** (Texas A&M Transportation Institute, Iteris, Contra Costa Transportation Authority from the US, China Automotive Technology and Research Center in China, the Australian Road Research Board, the Curtin University in Perth and Roads Australia from Australia, TUMCREATE and Centre for Excellence for Testing and Research of AVs in Singapore, the Advanced Public Transportation Research Center, National Taiwan University in Taiwan and the European Department of Korea Institute of Science and Technology Europe). **All Letters are attached as Annexes of the project Grant Agreement.**

In addition, SHOW has been endorsed since the proposal phase by a series of European bodies, namely: **AGE, ALICE, ECF, CLEPA, EARPA, ECTRI and EDF.**

4.3 Consortium bodies

4.3.1 The Partner Board (PB)

The Partner Board (PB) in the Consortium is the ultimate and top level decision body where each project beneficiary is represented by one person (and a proxy). The PB has the overall responsibility for the direction of the project, and has the power to agree upon its proposals for the allocation of the project's budget in accordance with the EC Grant Agreement; actions affecting defaulting partners; participation of new partners in the project, by entering into the EC contract and the Consortium Agreement; changes to technical specifications in Annex 1 of the GA and exchange of activities between partners. Recommendations for amendments to the work plan, major technical, financial and resource allocation decisions along with periodic and final reports will be submitted to the GA for ratification, including without limitation, decisions regarding technical and business direction of the project, amendments to the DoA and effort allocation, specific contractual issues with the EC, policies for promotion and exploitation of results and financial planning and control and other administrative arrangements.

The main PB duties are:

- Define and maintain overall project objectives, targets, general directions, implementation plans;
- Evaluate the progress of the project & approves progress reports and milestone;
- Elaborate actions needed to be taken in case of deviation;
- Approve changes to Consortium Agreement and contracts. Decide on new consortium partners;
- Handle defaulting parties (if required);
- Agree on (re-)allocation of budget;
- Act on conflict resolution (highest level);
- Maintain procedures for knowledge management;
- Establish quality procedures;
- Review risks;
- Develop dissemination and exploitation plans;
- Coordinate external relations (press, standardization, etc.);
- Coordinate operational matters, including reporting and calls for meetings.

4.3.2 The Project Core Group (PCG)

The Project Core Group (PCG) makes executive decisions on strategic issues and has a major impact on the overall outcomes and success of the partnership. Major decisions concerning overall technological, innovation and exploitation direction of the project are taken herein. Policies, standards, quality and IPR/knowledge management and publishing procedures will be approved by the PCG. It will also make recommendations for amendments of the EC GA towards ratification by the PB. Overall, the PCG is subject to the decisions made by the Partner Board.

The PCG consists of:

- the **Project Management Team** (PMT) that will chair the Board;
- the **Sub-project** (SP) Leaders, which are responsible for the overall monitoring and performance of the SP they are responsible for and will report on a monthly basis about it to the PMT. In a subsequent way, WP leaders report to SP leaders, whereas Activity leaders report to WP leaders.
- **Other Industrial representatives**: TRANSDEV, KEOLIS, EASYMILE, VIF, FEV, AVL & Other Research/Academia & end-users representatives: VEDECOM, AIT, VTI, TECNALIA, RISE, EUROCITIES. From time to time, the PCG may include additional members, to ensure that all major project perspectives will be covered. The PCG composition will be ratified by the Partner Board.

The leaders (proxies will be defined to replace the leaders whenever needed) of each project SP are as follows, as listed also in Table 4:

- **SP I**: Use Cases and Business Scenarios - Leader: CERTH/HIT; Subleader: ATE;
- **SP II**: System architecture, technologies and tools - Leader: NAVYA; Subleader: ICCS;
- **SP III**: Evaluation, demonstration and impact assessment - Leader: TNO; Subleader: VTI;
- **SP IV**: Horizontal issues - Leader: UITP; Subleader: ERTICO.

4.3.3 The Project Management Team (PMT)

The PMT will be responsible for the day-to-day project management and the follow-up of decisions and directions derived from the EC, the PCG and the Partner Board meeting the GA and other EC requirements.

The PMT shall report to and be accountable to the Partner Board.

It consists of:

- the **Project Coordinator** – Dr. Henriette Cornet, UITP
- the **Technical & Innovation Manager** – Dr. Evangelos Bekiaris, CERTH/HIT
- the **Quality & Risk Manager** – Dr. Nikolaos Tsampieris, ERTICO
- the **Ethics Manager** – Anna Anund, VTI
- the **Demonstration Board Manager** – Peter Staelens, EUROCITIES

The Project Coordinator (PC) and the Technical & Innovation Manager activities are outlined in WP14. The PC who is responsible for the overall project execution chairs the PB.

The Quality & Risk Manager chairs and interacts on a weekly basis with the Quality Control Board (QCB). He will assist the Project Coordinator and the Technical and

Innovation manager in the overall monitoring and control of the project. The relevant activities are outlined in WP14.

The Ethics Manager chairs and interacts on a weekly basis with the Ethics Board (EB).

The Demonstration Board Manager works closely together with the Project Demonstration Board formed by the demonstration leaders, the local operators, authorities and the local community needed to perform the demonstration.

4.3.4 The Project Demonstration Board (PDB)

The Project Demonstration Board (PDB), reports to the Project Core Group on a monthly basis through TNO (SP3 leader) and EUROCITIES (Demonstration Board leader) and consists of the Executive Boards of each Mega and Satellite demonstration site of the project; each one being represented by the denoted leader and a City or Operator representative.

EUROCITIES, as the PDB leader, is responsible for the upper-level coordination and monitoring of all demonstration activities in SHOW in close consultation with the Technical Coordinator (CERTH) and the Project Coordinator (UITP). As mentioned in the project Governance Scheme, the Executive Boards of each Site consist of the site leader and the City/Operator representative in each case. The Executive Boards are defined in the following table and are subject to changes/replacements in the course of the project. It should be noted that the City/Authority/Operator representatives are in some cases from entities internal and in other cases external to the project. The latest reveals that SHOW has started from the beginning the engagement of the wider communities.

Table 6: The Project demo Executive Boards of Mega and Satellite sites (updated).

Mega/Satellite demo site	Demo Site Executive Board	
	Site Leader	**City/Authority/Operator representative**
Chair of the PDB	Peter Staelens, EUROCITIES	-
Leader of the French twin Mega Pilot [12]	Nadège Faul, VEDECOM	• Catherine Goniot, Rouen Métropole • ~~Florent Poiret, CHU Rennes~~ • ~~Gwénaël Bodo, Rennes Métropole~~ • TBC pending the approval of the replacement site
Leader of the German triplet Mega Pilot	Katharina Karnahl, DLR	• Isabelle Pitre, City of Aachen • Michael Fritz, City of Karlsruhe • ~~Tim Neugebauer, City of Mannheim~~ • Alexander Bergweiler, BSM • Sofia Pavlakis, RMS
Leader of the Austrian triplet Mega Pilot	Alexander Fürdös, ATE	• ~~Martin Demel, Wiener Linien~~ • ~~Susanne Pröstl, Wiener Linien~~
Leader of the Swedish corridor Mega Pilot	Tor Skoglund, RISE	• Mattias Näsström, Östgötatrafiken • Jonas Sjödin, City of Linköping

[12] Subject to change with the on-going Amendment procedure (status June 2022)

Mega/Satellite demo site	Demo Site Executive Board	
	Site Leader	**City/Authority/Operator representative**
Leader of the Madrid Mega Pilot	Lucia Isasi, TECNALIA	• Julian del Olmo, EMT • Cesar Omar Chacon, EMT
Leader of all Satellite sites	Pekka Eloranta, SITOWISE	-
Leader of the Tampere Satellite site	Pekka Eloranta, SITOWISE	Mika Kulmala, City of Tampere
~~Leader of Copenhagen Satellite site~~	~~Anette Enemark, MOVIA~~	~~TBC~~
Leader of the Brainport Eindhoven Satellite site	S.T.H. (Sven) Jansen, TNO	TBC
Leader of the Trikala Satellite site	Anna Antonakopoulou, ICCS	• Odysseas Raptis, e-Trikala • Giorgios Klonaris, e-Trikala
Leader of the Turin Satellite site	Brunella Caroleo, LINKS	Nicola Farronato, Città di Torino
Leader of the Brno Satellite site	Marek Vanžura, CDV	Ivan Hlousek, City of Brno

In turn, each Executive Board chairs the local demonstration board that – in a superset – consists of the following local entities:

- Ministry
- City/Municipality
- Operators and Fleet Providers
- User Association
- SME's and other stakeholders
- Research & Academia entities that participate in the SHOW project either as full beneficiaries or through Letter of Support/Commitment.

The full contact list of each SHOW demo site local board is available upon request and is considered a living document during the project.

4.3.5 The Quality Control Board (PCB)

The Quality Control Board (QCB) is responsible for supervising the high quality and in-time implementation of the SHOW work plan and its planned outcomes (milestones & deliverables). The QCB consists of the following members:

- the **Quality and Risk Manager** (ERTICO),
- the **Project Coordinator** (UITP),
- the **Technical & Innovation Manager** (CERTH/HIT),
- **one internal expert** (or more) assigned by each project beneficiary

The internal expert(s) assigned by each partner is at least a Senior Researcher or Project Manager, not directly involved in the project, with extensive know-how in the topic of the specific deliverable, excluding its authors. Members of the different forums of the project are considered as potential reviewers especially for the public deliverables. Also, as indicated in Appendix II that provides the peer review plan of the Deliverables, for some selected Deliverables, Advisory Board members will be asked to provider their review in addition.

The QCB ensures the conformity of all project Deliverables with their respective requirements (i.e., the SHOW GA and the current Quality Plan).

4.3.6 The Ethics Board (EB)

The Ethics Board (EB) ensures the compliance of the project to Ethical issues and requirements. Its upper goal is to guarantee that all evaluation and demonstration activities planned abide to regulation.

Chaired by VTI, it consists of one representative by each site of the project assigned with the task to oversee the compliance of activities held to the ethics related principles set.

Within A3.2 “Ethical and privacy issues”, the Ethics Board has issued an **Ethics and Data Privacy Manual** (D3.2) in M05, which has been enriched in D3.4 (submitted in M13) and in D3.5 Final SHOW Ethics manual, Data Protection Policy and Data Privacy Impact Assessment (submitted in M26).

The Ethics and Data Privacy Manual covers both the ethical requirements for setting up the demonstration’s sites including all cities involved, but also the final evaluations and (if needed) ethical approval to collect data on humans. It also includes the overview of external and internal to the project ethical requirements for countries and organizations involved, whilst it finally provides a detailed Data Privacy Impact Assessment (DPIA).

Furthermore, within WP18 “Ethics requirements”, UITP confirms the appointment of a **Data Protection Officer** (DPO) and the availability of the contact details of the DPO to all data subjects involved in the research.

D18.1 “**Protection Of Personal Data** (POPD) – H – Requirement No. 1” (submitted M05) provides templates for internal project ethical applications forms, informed consent, data privacy, protection forms, data management plan, etc.). The signed informed/consent forms (in case this is used as lawful basis on then sites) throughout the project are collected herein and presented to the Commission upon request. In D18.2 “POPD – Requirement No. 3” (submitted M05), it is explained how all of the data that SHOW intends to process is relevant and limited to the purposes of the research project (in accordance with the ‘data minimisation ‘principle).

Within A14.6 “Data Management”, a **Data Management Plan** (DMP) has been issued in D14.2 (submitted M06) and updated in D14.3 DMP Final (submitted in M27). The DMP details what data the project generates, whether and how it is exploited or made accessible for verification and re-use, and how it is curated and preserved following the FAIR principles, defining their way/means of collection (against enhanced General Data Protection Regulation (GDPR) compliant templates) and identifying the open access layer. For more detail on data management, refer to the section 2.2.1.2 “Knowledge and data management and protection” of the GA, p.252.

Furthermore, the SHOW Ethics Board defines the overarching procedure and criteria for identification and recruitment of participants across pilot sites and pilot testing activities and includes them in D3.5. Within this task, the collection and monitoring of ethical approvals (if needed), before and during project pilots, is included.

The Ethics Board issues regular updates of the project Data Protection Policy and it ensures that the involved Partners are getting familiarized with the process of Data Privacy Impact Assessment (DPIA) of the project.

Also, it defines and ensures the implementation of the security measures required to **prevent unauthorised access to personal data** or the equipment used for processing. Description of the anonymization and pseudonymisation techniques that will be implemented and detailed information on the informed consent procedures regarding data processing are included.

Gender and equity issues are monitored to guarantee equal (to the maximum extent) representations of genders, age groups, mobility limitations and socio-economic groups, especially in relation to the demonstration's sites evaluations.

If deviations are identified from the defined principles, feedback is given to the relevant partners for mandatory adjustments and the monitoring procedure templates and approvals received from the regional authorities in each site/country. All requirements emerging from the ethics report of the proposal are continuously addressed and monitored in the context of this task.

4.3.7 The Advisory Board (AB)

The Advisory Board (AB), led by ERTICO continuously provides its consultation to the PMT, throughout the whole project course. It consists of high-level experts and ensures that the project is aligned and up-to-date with the other related activities and projects internationally, encompassing also in this respect representatives from the key twinning actions planned in the project.

The Advisory Board members (updated list) are namely:

- **Tom Voege**, independent advisor in the area of transport policy;
- **Christos S. Xenophontos**, Assistant Director, Rhode Island Department of Transportation, US and Co-Chair of the International Committee at TRB;
- **Julia Wadoux**, Policy Coordinator for Health, ICT and Accessibility, at AGE;
- ~~**Adam Bodor**, Advocacy and EuroVelo Director, European Cyclists' Federation, -~~
- **Endre Angelvik**, RUTER Oslo, Chair of the UITP Combined Mobility Committee and UITP SPACE;
- **Georgios Giannopoulos**, Professor emeritus Aristotle University of Thessaloniki, cor. Member Academy of Athens;
- **Suzanne Hodley**, Senior Manager at Polis Network;
- **Dr. Young-Jun Moon**, Chief Director in Korea Transport Institute (KOTI);
- **Timothy Papandreou**, Founder Emerging Transport Advisors.

Other international experts will be considered as part of an extended Advisory Board when necessary and, also, in case of liaison for international cooperation (twinning activities) with US, Korea, Japan, Singapore, Australia and China.

A number of experts already expressed the interest to support SHOW's activities through a Letter of Support, as listed below. The list will be revisited during the course of the project.

- Yu, Director of Intelligent Vehicle and Automotive Software Testing Office in CATARC, China.
- David Stuart – Watt, President of Roads Australia.
- Young-Kyun Lee, Executive Director of ITS Korea, Republic of Korea.

Key layers of collaboration with the members of the AB have been defined:

1. Review of selected SHOW Deliverables, as noted in the Appendix II.
2. Review of the risk mitigation strategies of the project on annual basis.
3. Participation to demo and other events organised by the project.
4. Participation in the Stakeholder Forum.
5. Consultation on key extraordinary challenges emerging during the course of the project.

4.3.8 Other Bodies

Other bodies participating in the project governance are as follows:

- **Dissemination & Communication Manager:** Rita Bhandari, Programme and Project Communication Manager at ERTICO ITS, will coordinate all dissemination activities of the project
- **Exploitation Manager:** Ralf Willenbrock; ITS Product Manager of T-Systems, being responsible for coordinating the business models development, application per site, validation, optimization as well as coordination of the exploitation plans of all Partners.
- **Replication Manager:** Odisseas Raptis, CEO of eTrikala –Trikala City development agency, being responsible for the coordination and monitoring of all replication activities in the project, starting from its early beginning with the contribution in needs inventory to the end of the project with the issue of the follower sites replication plans.

5. Key project management processes

5.1 Introduction

The project management approach is based on management plans and techniques used successfully for other European projects coordinated by UITP and CERTH/HIT. SHOW project has a complex organisational structure including partners with complementary and interdisciplinary expertise. It requires an efficient management structure, which can handle the complexity and assure a smooth implementation and achievement of its ambitious goals. The aim of the management structure and procedures is to organize and manage the foreseen resources in such a way that the project is completed within the defined scope, quality, and time and cost constraints.

The general purpose of the project management activities are financial, administrative, scientific and knowledge & innovation aspects, i.e. coordination of activities, analysis and design of objectives and events, planning the work according to the objectives, risk management, allocation and controlling of resources, assigning tasks, controlling project executions, tracking and reporting progress, analysing the results based on the facts achieved, forecasting future trends in the project, quality management, conflict resolution, identifying, managing & controlling changes, project closure, coordination of dissemination activities, management of intellectual property.

5.2 Decision process and conflict resolution

The PCG provides a forum for the discussion of major management issues and technical issues. Their decisions are binding for the project and will be based on recommendations from the PMT. The PCG decides on the work plan and prepares proposals to the Commission.

All reports, including the Progress Reports and the Deliverables are discussed and approved before being sent to the Commission.

The procedures for decision-making within the PCG are following a majority vote, with the Project Coordinator having the casting vote. Each entity participating in the Partner Board has one vote. It can also amend PCG's decisions with a 2/3 majority.

The Partner Board serves as an overall monitoring board and holds a decision-making role mainly when a serious disagreement occurs in the PCG.

Day-to-day decisions at the technical level are taken by the PMT. When it comes to more serious decisions affecting the overall project, the WP leaders provide input to the SP leaders, who in turn participate in the PCG.

For any conflict or dispute that arises in the work of one or more partners, first, the partner or partners involved make an effort to immediately deal with the contingency. In case this is not achieved, the steps listed below will be followed in their respective order:

1) Involvement of the WP leader (if applicable) to resolve the issue.
2) Involvement of the Subproject (SP) leader.
3) Involvement of the Technical & Innovation Manager.
4) Involvement of the Project Coordinator.
5) Notification to the Project Core Group.
6) If resolution is not achieved after all the above steps are taken, the issue will be brought to the attention of the EC.

5.3 Activity and Resource Management

In order to manage and document the project's results in the most efficient way, activity execution and management are organised in a distributed way, following the project structure defined in the DoA, by the leaders of activity management at each level as seen below:

- **1st level:** Activity
- **2nd level:** Work Package (WP)
- **3rd level:** Subproject (SP)
- **4th level:** Project Management Team (PMT)
- **5th level:** Project Core Group (PCG)
- **6th level:** Partner Board (PB)

Progress, activity execution, use of resources and risk management involved in the preparation of each Deliverable is followed by Activity, WP and SP leaders. Each Partner involved in a given Activity is required to report to the Activity leader on progress and achievement of targeted outcomes in which they are involved according to the work programme and of the DoA. These targeted outcomes include, but not be limited to, the following:

- Deliverable and Activity objectives for the period;
- Work progress towards objectives over the time period covered (including meetings and teleconferences);
- Internal Control Points/Milestones/Deliverables achieved in the period;
- Explanation of the gaps and their impact on other tasks;
- Reasons for failing to achieve critical objectives and/or not being on schedule, and impact on other tasks as well as on available resources and planning;
- Level of Success Criteria and foreseen Innovation fulfilment;
- Corrective actions planned or taken.

Work Package leaders oversee the Activities' progress and use of resources, and report the advancement to the Subproject leader and the Technical and Innovation Manager. The Technical and Innovation Manager liaises with the Coordinator and bring in his attention the progress, risks and issues that need to be managed at that Project Management Team level. Key strategic and critical issues are also brought in the attention of the project Core Group. Finally, management of Consortium level issues is done at the level of the Partner Board.

5.4 Process for initiation / planning of WPs and tasks

1. Technical and Innovation Manager in synergy with the SP leaders request WP leaders to initiate their WPs.
2. WP leaders request Activity leaders to initiate tasks.
3. Activity leaders come back with working document/detailed plans.

5.5 Process for WPs and tasks performance

1. Each partner responsible for performing part of a task prepares an internal report with the results obtained as soon as the task finishes. This internal report is sent to WP partners.
2. WP partners send comments, if any, on this report within 5 days. The author revises the report and submits the final one to the WP leader with copy to all partners.

3. If one or more activities result into a Deliverable, the Deliverable main author synthesises the tasks internal reports into the expected Deliverable.
4. The Deliverable main author submits the Deliverable for peer review with a notification to the Quality Manager, the respective WP and SP leader and the Technical & Innovation Manager.
5. The Quality Manager follows the process as defined in section 6.
6. The Deliverable Author sends the Deliverable for submission to the Coordinator, after conforming to the Peer Review process outcomes, with notification to the Quality Manager, the respective WP and SP leader and the Technical & Innovation Manager.
7. The Coordinator submits the Deliverable to the European Commission, with notification to the Author, the Quality Manager and the Technical & Innovation Manager.
8. As soon as all Deliverables and their official/unofficial updates in a WP are submitted to the European Commission through the Coordinator (after having been peer reviewed), the WP is considered closed.

5.6 Communication tools and mechanisms

In order to avoid an excessive use of email that would result in a potential loss of information, especially in such a big Consortium, and having in parallel the need to keep the whole Consortium well informed and always up to date of the project progress, the project communication mechanisms reflect the structure of the project, and is targeted as much as possible to an as much as possible dedicated group of members in each case.

To obtain maximum flexibility, transparency and awareness, all the documents in the project shall be transmitted and published via the **project management tool (Cooperation Tool[13]).** In addition and on complementary basis, direct transmission of information to the partners is used where appropriate via email.

The objectives and advantages of such a tool are namely:

- Targeted team communication
- Centralised meeting information: agenda, minutes, etc.
- Document repository
- Multi-platform / multi-device access
- Flexible and customizable

Cooperation Tool (CT) is a Web application aimed at supporting the collaborative work of geographically distributed research teams involved in European research projects (*CT4-Cooperationtool4*, n.d.). SHOW Project has its own domain at the CT that is open only for the project's participants.

For access to the website, users are provided with a username (e-mail address) and password (automatically created by the website during the first registration). Beneficiaries who do not have access to the website can ask the Coordinator to open an account. The CT serves as a repository for all documents, including confidential ones.

[13] https://www.cooperationtool.eu

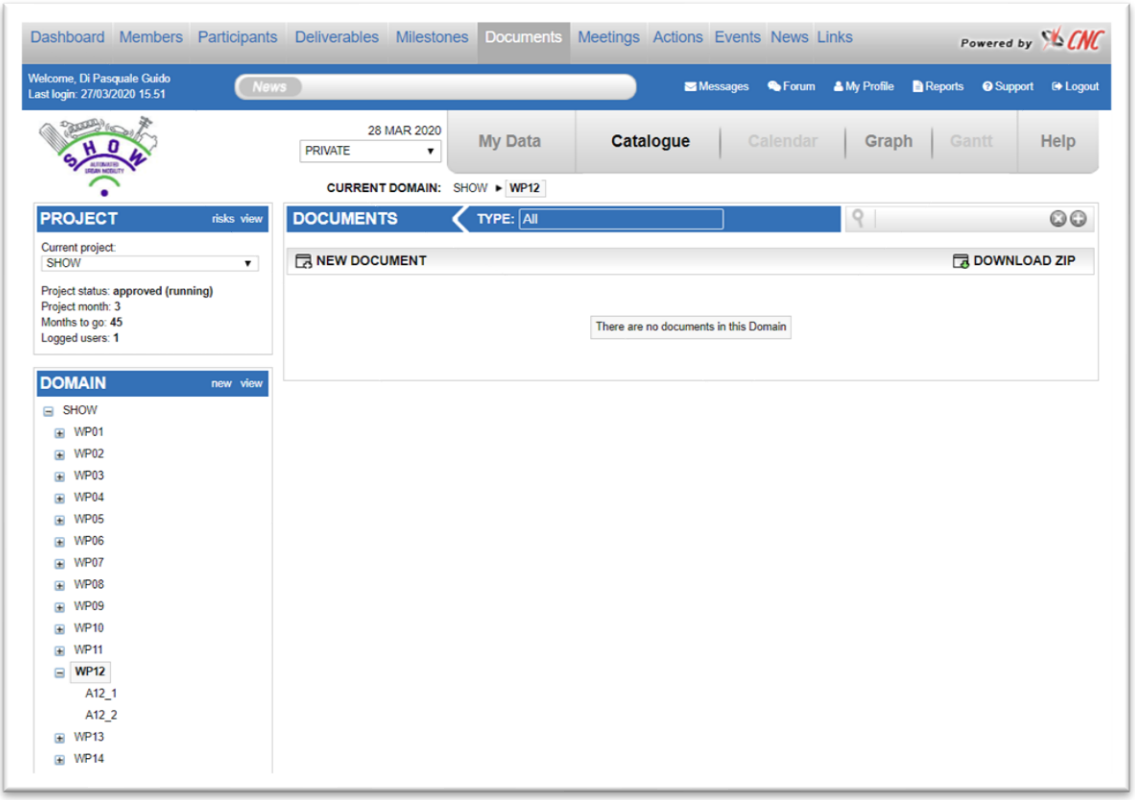


Figure 6: Cooperation Tool for SHOW document sharing.

Internal reporting includes management (progress, conflict handling, etc.) and other reports produced by the SP/WP Leaders. The SP/WP/Activity Leaders produce the minutes of their own WP/Activity meetings and contribute to periodic reports, as appropriate.

In addition, every official meeting of the project should be traceable on the Cooperation Tool in the Meetings section (Minutes of meetings and Agendas), allowing the members to be informed about meetings and allowing them to claim those travel costs when applicable.

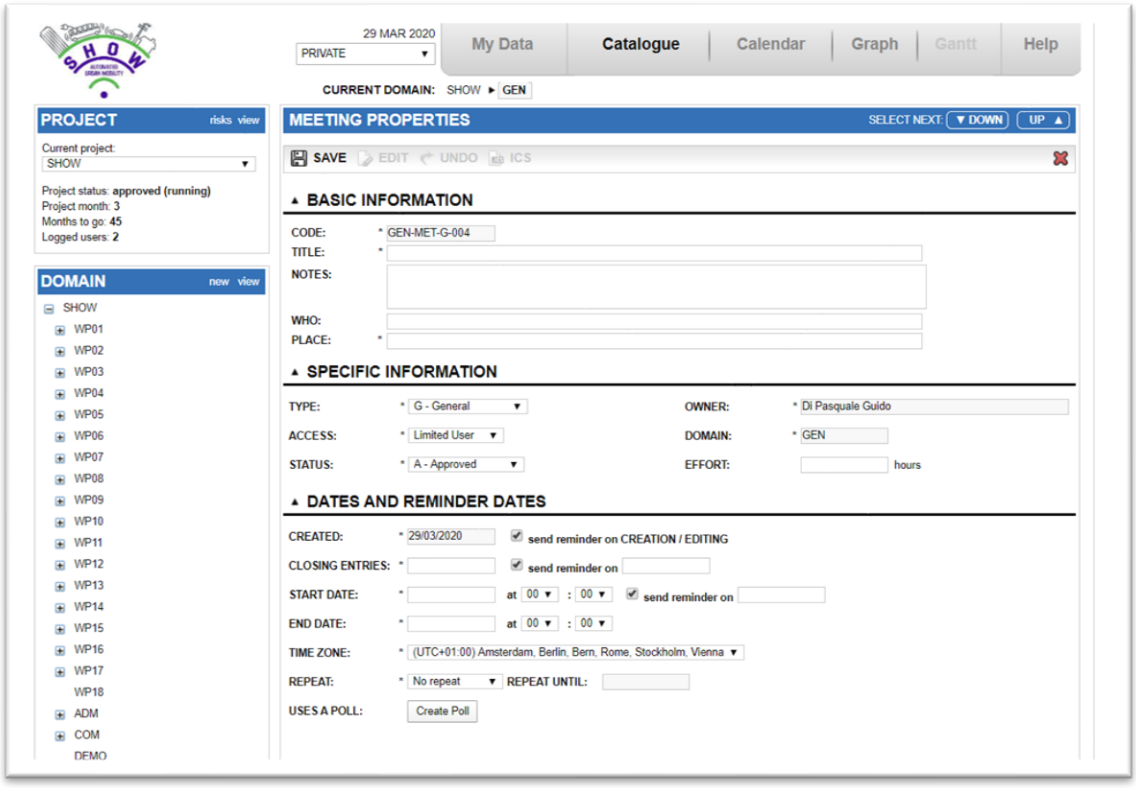


Figure 7: Cooperation Tool for management of SHOW meetings.

All project's bodies, as listed in section 4.3, have dedicated mailing lists generated by the Cooperation Tool, e.g. SHOW.GEN.GU@cooperationtool.eu for the email distribution to all partners.

The coordinator ensures a continuous support to partners through dedicated experienced persons acting as "**Help Desk**". The Help Desk monitors the status of the partners and support on demand any project management and administrative request in order to anticipate critical issues and mitigate any type of risk related to the management of the project's partners.

The Help Desk is (currently) formed by:

- Henriette Cornet, Justyna Beckmann, Helmut Berends, and Sylvia Derveaux (UITP)
- Maria Gkemou, Matina Loukea, Anastasia Kostouli and Mando Karvelli (CERTH/HIT)

In addition, a specific section in the Cooperation Tool has been reserved to serve as a repository for the documentation to be accessible by the Project Management Team. A respective dedicated place has been reserved to be accessible only by the Project Officer and another one by the Advisory Board.

As such, all project documentation is stored in the corresponding Cooperative Tool domain (there is one dedicated for each WP and Activity) following the versioning system that is supported therein (with respective notifications to the members, also supported by the tool). The Coordinator has already trained the Consortium members on the Cooperation Tool through a webinar.

Each partner is responsible for hosting code developed for the project in specific repositories (e.g. gitlab, github, other git clients). Access to this code to other project

partners is specified and clarified between the partners and the WP leader, the SP leader and the Technical Manager in case code sharing is extended between multiple WPs. In any case, links to external repositories will always exist in the respective domains of the Cooperation Tool to allow centralized knowledge retrieval throughout the project.

Cooperation Tool Posts (or e-mails) headings in SHOW follow the convention below:

- "SHOW - PMT – title of message": for posts/e-mails concerning only the PMT.
- "SHOW – All – title of message": for posts/e-mails concerning all project participants.
- "SHOW – PCG – title of message": for posts/e-mails concerning only the Project Core Group.
- "SHOW – SPx/WPx/Ax – title of message": for posts/e-mails concerning specific SPs/WPs/Activities.
- "SHOW – Demo sites – title of message": for posts/e-mails concerning demonstration sites and their activities.

5.7 Project meetings

In order to ensure a rapid and efficient launch of the project tasks, dedicated management tools and procedures, fitting all specific management requirements are proposed from the start of the project. These tools are placed under the responsibility of the Project Core Group, the Project Management Team, the Work Package Leaders and the Activity Leaders. As mentioned in the previous section, the Cooperation Tool is the tool to be used for meeting management and record keeping.

To ensure the project maintains rhythms and a team dynamic, the project is oriented around team meetings on several layers, as listed in Table 7. Overall, the following process will be followed for any type of meeting.

1. Before each scheduled meeting (of any type), the initiator prepares a draft agenda (using the format of **Appendix VI**) and sends it to expected participants for revision and finalisation.
2. During the meeting, the initiator/chair of the meeting (of any type) is responsible for keeping minutes, which are following the template of **Annex VII**. Minutes are sent within **7 calendar days** after the meeting end and comments from participants are accepted within **14 calendar days**.
3. The meeting initiator/chair sends the final revised meeting minutes to the whole team concerned in each case within another **2 calendar days**.

In specific, the Coordinator announces the Partner Board meetings at least four months in advance, except for extraordinary cases in which meetings may be called at short notice. **Partner Board Meetings minutes**, as an exception to the above schedule, are produced by the PMT and distributed to all for review within **15 calendar days** as of the meeting realization date. Comments are received in a timeframe of another **15 calendar days**.

The anticipated meetings flow in the project upon the various layers is as follows.

Table 7: Meetings frequency, goal and participants per consortium body.

Consortium body	Frequency	Goal	Participants
Partner Board (PB)	1 physical meeting twice per year (up to 1 more extraordinary meeting may be convened upon the PMT or the PCG decision); in	Partner Board (PB)	1 physical meeting twice per year (up to 1 more extraordinary meeting may be convened upon the PMT or the PCG decision); in

Consortium body	Frequency	Goal	Participants
	addition, 2 virtual meetings yearly.		addition, 2 virtual meetings yearly.
Advisory Board (AB)	1 physical and 1 virtual meeting per year.	Advisory Board (AB)	1 physical and 1 virtual meeting per year.
Project Management Team (PMT)	4 physical meetings annually – may be convened in conjunction with PB and PCG meetings (extraordinary meetings may be convened upon the Coordinator request) – and 1 virtual meeting per month.	Project Management Team (PMT)	4 physical meetings annually – may be convened in conjunction with PB and PCG meetings (extraordinary meetings may be convened upon the Coordinator request) – and 1 virtual meeting per month.
Project Core Group (PCG)	4 physical meetings annually – may be convened in conjunction with Partner Board and EB meetings – and 1 virtual meetings every 2 months.	Project Core Group (PCG)	4 physical meetings annually – may be convened in conjunction with Partner Board and EB meetings – and 1 virtual meetings every 2 months.
Project Demonstration Board (PDB)	3 physical meetings annually with the whole of the local community and 1 virtual meeting monthly.	Project Demonstration Board (PDB)	3 physical meetings annually with the whole of the local community and 1 virtual meeting monthly.
Technical & Innovation Management	4 physical meetings annually – may be convened in conjunction with PB meetings (extraordinary meetings may be convened upon the Technical and Innovation manager request) – and 1 virtual meeting once per month.	Technical & Innovation Management	4 physical meetings annually – may be convened in conjunction with PB meetings (extraordinary meetings may be convened upon the Technical and Innovation manager request) – and 1 virtual meeting once per month.
Subprojects	4 physical meetings annually – may be convened in conjunction with other meetings (extraordinary meetings may be convened upon the respective SP leader request) – and 1 virtual meeting per month.	Subprojects	4 physical meetings annually – may be convened in conjunction with other meetings (extraordinary meetings may be convened upon the respective SP leader request) – and 1 virtual meeting per month.
Work Packages	Physical meetings are convened as many times required and upon decision	Work Packages	Physical meetings are convened as many times required and upon decision

Consortium body	Frequency	Goal	Participants
	and request by the WP leader, in conjunction with other physical meetings.		and request by the WP leader, in conjunction with other physical meetings.

Extraordinary meetings for all project's bodies can be called anytime by the PC to handle extraordinary situations, e.g. discussing and assessing the impact of COVID-19.

As mentioned in the previous section, (all types of) meetings information are stored in the Cooperation Tool. PMT meetings are kept confidential to the PMT members. Deviations from the frequency abovementioned meetings will be investigated and updated (if needed) in PR2, once the Coordinator and the PMT have a full picture of the actual necessity of in-person project meetings following two years of virtual meetings through COVID.

5.8 Reporting processes

5.8.1 Internal Report

Every 6 months, the Project Coordinator (UITP) coordinates the production of an Internal Report (financial and technical) in collaboration with CERTH/HIT on the basis of a template that will follow the guidelines provided by the PO and will follow the same principles – though in a lesser extent – as the formal mid and final progress reports. The template is made available before each Internal Report is due, as it may be subject to small changes from one internal reporting period to the other depending also the comments and requests of the PO.

Content of the template is as follows:

- Summary on progress and highlights
- Progress towards the planned objectives
- Deviations from Annex 1 of the GA
- Statement on the use of resources
- Critical implementation risks and mitigation actions
- Dissemination activities, scientific publications and intellectual property rights
- Gender balance
- Future steps for the next 6 months

All partners will send their completed templates back to the Project Coordinator who reviews them. Once approved, they are collated into a comprehensive Internal Report. This report is then submitted to the European Commission as they are also deliverables and made available to the Consortium.

The financial figures are collected every 6 months via the Cooperation Tool, which includes functionalities developed for the financial management of EU funded project. Each periodic report is divided into internal accounting periods of the duration of six months. The collection of financial figures every six months is providing the Coordinator with an accurate tool to keep track of the project expenditures and to identify and prevent possible problems that might arise during the lifetime of the action.

Each beneficiary is responsible to report cost & explanation incurred during each accounting period. Costs and efforts are to be reported at least at WP level, which is the minimum level required according to the H2020 Periodic Report Template. The Cooperation Tool is used to submit the data from the partner to the Coordinator, once

the operation is complete. The operation is triggered by a notification that is generated and sent to partners when approaching the end of each accounting period, as a reminder for the submission of expenses account and explanations.

Costs to be eligible for reimbursement must be actually incurred by the beneficiary during the action duration, entered as eligible costs in the estimated budget of the action, connected to the action. Moreover, they are to be identifiable and verifiable. Categories of costs include (but are not limited to): personnel costs, travel, durable equipment, other goods and services, subcontracting, accordingly with the project needs and the content of budget reported in the grant agreement. The Coordinator will follow-up, collect, and check information following the notification issued by the tool. Beneficiaries are responsible for the prompt delivery and correctness of the financial figures provided.

Following the submission, the Coordinator might send to the beneficiaries' requests of clarification or comments based on the reported expenses account. These communications are executed via email. Once the clarifications are sent, and possible modifications are implemented, the interim periodic report is ready to be completed and introduced to the governing bodies of the action, as required.

By the end of each Reporting Period, the Beneficiaries have to draft and submit the Financial Statement via the Participant Portal of the European Commission. This process is facilitated by the use of the Cooperation Tool which is supporting Partners with a summary of their financial reporting along the relevant Internal Accounting Periods. Beneficiaries must fill out the individual financial statement and then sign and formally submit it to the Coordinator. The Coordinator has the responsibility of consolidating costs figures received from the partners and the relevant explanations into the financial section of the periodic report to be then uploaded in the Participant Portal.

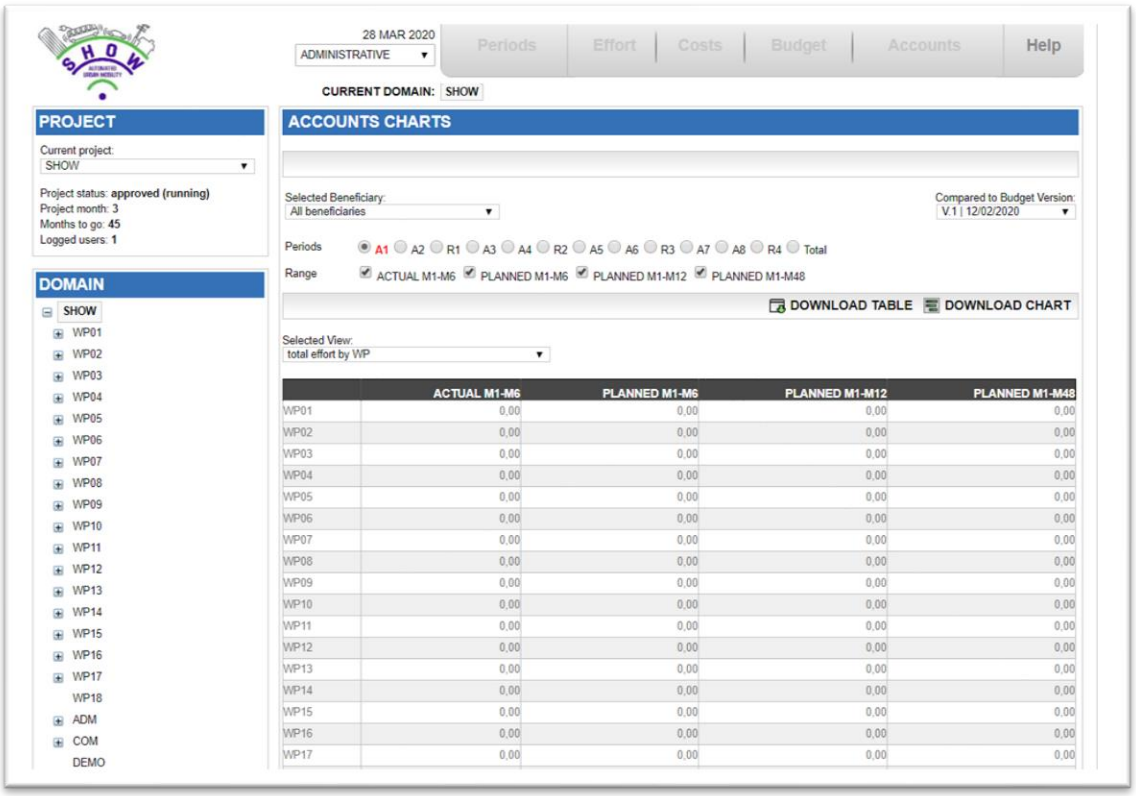


Figure 8: Cooperation Tool for financial reporting.

To ensure the understanding from the whole Consortium of the activities to be performed for financial and administrative reporting, the Coordinator organizes training sessions at the beginning of the action, in order to illustrate the fundamentals to input all relevant data into the tool. The training session are delivered by live webinars. This ensures smoother and more effective data collection for reporting throughout the whole duration of the action.

5.8.2 Periodic Reports

There are three official reporting periods in SHOW. The official reporting periods end with the submission of a periodic report to the European Commission. The different components of the periodic reports need to be submitted at once (single submission system), and within 60 days of the end of the reporting period.

The reporting periods are:

- RP1: from month 1 to month 18
- RP2: from month 19 to month 36
- RP3: from month 37 to month 48

A periodic report is composed of two main reports:

- Technical report
- Financial report

In the last Periodic Report, there will be an additional section on the overview of results, conclusions of the Action and the socio-economic impact of the Action.

5.8.2.1 Periodic Reports

The Project Coordinator (UITP) in collaboration with the Technical Manager (CERTH/HIT) is responsible for submitting the periodic report to the European Commission.

The Technical Manager circulates a template “Partner Template” to all partners to collect the necessary information, in order to compile the Technical Report.

The template is similar to the one for Internal Reporting described in Section 5.8.1, but covers the whole Reporting Period instead of six months. The template is made available 70 days before each Periodic Report is due, as it may be subject to small changes from one periodic reporting period to the other.

Partners will have 40 days to complete the Template and return it to the Project Coordinator and the Technical Manager who perform the check and validation and iterate the process as needed until the submission date.

5.8.2.2 The Financial Report

The Financial Report is distinct from the Technical Report insofar as each partner will need to complete individual financial statements online.

Personnel Costs

- All personnel whose time is claimed on the Grant should be recording the time they spend working on SHOW in a time recording system (e.g. timesheet, see the Template given as a model by the European Commission).

- The following information needs to be added to each staff member's cost claim: a brief description of the activities they carried out, the work package(s) and the amount of Person Months associated with these activities.
- A beneficiary can only claim time from staff that is effectively employed by their organization.

For further information on Personnel Costs, refer to the Grant Agreement Article 6.2 A. (pp.19-23).

Other Direct Costs

- Travel costs and related subsistence allowance are eligible if they are in line with a beneficiary's usual practices on travel.
- Furthermore, only trips that are directly linked with SHOW are eligible (e.g. annual projects meetings, WP meeting, conference in which SHOW and/or its results are presented, etc.).
- Equipment, goods, services, and consumable costs are eligible only if they are purchased and used specifically for SHOW e.g. computers, tablets, etc. are typically rejected because they are not exclusively used for the project, and therefore considered as being covered by the 'Indirect Costs'.
- Only the depreciation cost of equipment is eligible (not the full purchasing price).
- All 'Other Direct Costs' will need to be broken down when reported online.

For further information on Other Direct Costs, refer to the Grant Agreement Article 6.2 D. (pp.23-25).

5.8.3 Amendments

Though deviations vs Annex 1 – technical and financial – are reported in the periodic reports, a specific process is administered on a yearly basis in the project respectively. The goal is to reflect all requests for deviations, communicate to the PO so that he responds which of them adhere to official amendments or not.

The process is triggered and organized centrally by UITP through the Cooperation Tool, via the following table once a year (unless an extraordinary urgent/blocking case arises). Consolidation and communication to the EC is held by UITP.

Prior to any consolidation and communication to the EC, the PMT in first place and in turn the PCG review the beneficiaries' request and may accept or not the request. If accepted, it is moved forward to the next phase which is the inclusion in the consolidated table for the EC.

Table 8: Indicative table for deviation/amendment requests.

Request ID	Partner / Initiator beneficiary	Request Category	Initial state (per GA)	Proposed Change	Justification for Shift or Difference	Affected Task(s)/WP(s)	Other affected Beneficiaries	Expected impacts

5.8 Corrective and preventive actions

The formal description of the procedure is given below.

1. The PMT identifies need for corrective actions (i.e. could be originated also from a beneficiary/CG request).
2. The Coordinator notifies the PMT, the PCG (if not the initiator) and the respective SP and WP leader. The relevant request is documented in the appropriate form of **Appendix VIII**.
3. The WP leader discusses the issue with the respective Activity leader and beneficiary and comes up with the proposed solution. The proposal on corrective action is also using **Appendix VIII** form.
4. The solution is communicated to the PTM and is forwarded to the PCG via the Coordinator.
5. The PCG decides on the matter. The decision shall be documented according to the template of **Appendix IX**. The Coordinator sends this to all involved and checks that the actions decided are implemented. If the corrective action adheres to an amendment, the process described in the previous section is followed.

6. Quality assurance processes and principles

6.1 Quality policy

Quality planning is an integral part of management planning. As a pre-requisite to its preparation, the Quality Manager has reviewed all requirements in order to determine the necessary activities that need to be planned. This Quality Plan has been prepared early in the project in order to demonstrate and provide the Consortium with the assurance that:

a) the contract requirements and conditions have been reviewed;
b) effective quality planning has taken place;
c) the quality system is appropriate.

The Consortium quality policy is as follows:

- To implement and maintain a quality system according to ISO 9001:2015.
- To identify for all involved their responsibilities regarding quality.
- To ensure that all Deliverables and other tangible outcomes comply with the contract.

To ensure relevance of the quality plan during the project lifespan, the Quality Manager conducts quality reviews, throughout the duration of the contract and when contractual changes occur. The Quality Manager shall ensure that the quality plan is available to all concerned and that its requirements are met.

Quality assurance is cross-cutting to all distinct processes that are identified in this and the previous chapter (Key project management processes). The responsible Partners for ensuring that the required activities are carried out according to the principled defined are recognized in each corresponding chapter.

6.2 Quality System Review

The Quality System is to be reviewed within the Project Core Group meetings. In subsequent reviews the following will be taken into account:

- the results from project audits;
- the results from internal audits;
- the official project Deliverables (reports and prototypes);
- the corrective action requests;
- the preventive actions taken/proposed;
- any project prototype/solution deficiencies and subsystems/parts problems;
- project participants staff training and adequacy for the tasks undertaken;
- level of used resources per category and adequacy of spent resources for the particular task/activity.

Decisions on the above shall be discussed at Project Core Group meeting, will be minuted and will encompass:

- Level of satisfaction with the audits, corrective actions and the results of complaints;
- Requirements for further auditing or more corrective actions;

An agenda of such a meeting may include indicatively the following topics:

1. Results of Internal Audits
2. Corrective actions requests received
3. Equipment deficiencies
4. Defects in prototypes / solutions/ demonstrators/ deliverables

5. Complaints
6. Results of external audits
7. Supplier problems
8. Health and Safety
9. Training including needs and resources
10. Preventive actions
11. Review of quality policy and objectives
12. Introduction of new quality plans

Records to be kept are the minutes of the meeting which are to record those attending and the summary of the points raised/resolved. The records are to be produced and archived by the Quality Manager.

6.3 Deliverables preparation guidelines

All project results are materialized through a total of 82 Deliverables that have to be submitted to the European Commission during the SHOW lifespan.

To ensure optimal, smooth and timely delivery of every Deliverable, as well as homogeneous presentation, this section defines the structure, the layout of project report Deliverables as well as the procedure to be used for their development. The list of Deliverables to be generated in this project is available in section 1.3.2 of Annex 1 (part A) of GA (p.96), whilst they are also repeated in Appendix II of the current document.

6.3.1 Deliverable type and confidentiality levels

The Deliverables are classified according to the following types.

Table 9: Deliverable type references.

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

The following document confidentiality categories are defined for SHOW project.

Table 10: Deliverable Confidentiality Level References.

Reference	Meaning	Description
PU	Public	Fully open, e.g. web
CO	Confidential	Confidential, only for members of the consortium (including the Commission Services)

6.3.2 File naming convention

The Deliverable file naming follows the convention below.

"SHOW_D.No_short name_VERSION_STATUS.extension"

Table 11: Deliverable file naming convention.

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

The objective of the naming convention is to simplify and to make the identification of a document produced by the project self-explanatory. This naming convention is applicable to the official documents defined in the Grant Agreement and in the DoA (Deliverables, Periodic and Final reports to the European Commission), as well as to internal documentation of the project (i.e. that one related to project meetings, internal reports, etc.). The document naming convention is formed by the above elements, separated by "_". For instance, the first draft version of this document in PDF format is SHOW_D14.1_Project Management Plan_0.1_DRAFT.pdf.

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

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

6.3.3 Deliverables format & layout

All project report documentation (of any type) uses the template produced by the project. These can be found in the SHOW Cooperation Tool domain in the "COM/TEMPL" folder. The key ones are annexed to this Deliverable. The dissemination related ones will be annexed to the WP15 respective Deliverables.

All the 82 official Deliverables to be submitted to the EC should be formatted according to the Deliverable template of Appendix I of this document. This template is also available in the Cooperation Tool. The template provides a Deliverable structure and specifies formatting for the most commonly used elements of the Deliverable report. The partners responsible for the Deliverable are required to ensure that before releasing the first Deliverable draft to partners, it is in the correct template and specified format. The Quality Manager is the final responsible for conforming this consistency.

Apart from that, Deliverables should follow the rules and avoid some frequent mistakes, as listed below:

- Deliverables should have the quality of a book.

- Deliverables should include all the outcomes of all associated tasks to them. It is upon the responsibility of the Main Author (as assigned in the DoA) to collect from other beneficiaries their input, evaluate their quality and, if needed, ask for revised versions and critically synthesize them in order to reach the expected goal.
- There is no rule in size of Deliverables; still, excessive verbalism should be avoided. Analytical information that go in depth in one topic should be put in an Annex and only a summary of them should be included in the main body text.
- UK English is the official language of the European Union and, as such, the working language of the Deliverables.
- The standard format to be followed is the one provided in Appendix I.
- Header and footer and headings should follow the pattern of the current Deliverable.
- Acknowledgement to the EC should be included in the cover page, as in the current Deliverable and as follows:

This report is part of a project that has received funding by the European Union's Horizon 2020 research and innovation programme under Grant Agreement number 875530

Frequent mistakes that will be avoided in SHOW are as follows:
- Start with content without purpose nor initial Table of Contents.
- Executive summary looking like introduction or conclusion.
- Purpose looking like introduction.
- Conclusion looking like Executive Summary.
- No logic in the document structure – no methodological sequence - no relevance to the project.
- Not reflecting a global vision but aggregating different visions from different beneficiaries, without logic.
- Copy / paste – plagiarism - poor English - wrong usage of style.

All official Consortium documents in the previous section, except from the Deliverables, are cumulatively characterised hereafter as Project **Internal Reports (IR)** and follow the template of **Appendix IV.** Whenever applicable, they follow the same rules as defined above for the Deliverables.

Project meeting agendas follow the template of **Appendix VI.** Project meeting minutes follow the template of **Appendix VII**.

6.4 Deliverables quality review and roles

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

1. By the **Quality and Risk Manager** (ERTICO)
2. By the **Project Coordinator** (UITP),
3. By the **Technical & Innovation Manager** (CERTH/HIT),
4. **By two experts from entities internal to the Consortium**, as indicated in Appendix II
5. **Selectively for some Deliverables, by some of the Advisory Board members** depending their know-how and their availability

The peer review template of **Appendix V** will be used for this purpose.

As seen in Appendix II, a series of Deliverables (i.e. the managerial Deliverables including the current D14.4) are excluded from peer review.

6.4.1 The Quality Manager & his responsibilities

The Quality Manager (Dr Nikolaos Tsampieris - ERTICO) is the person who has the authority to manage all quality processes taking place in the project.

Dr Nikolaos Tsampieris is a Senior Manager in ERTICO ITS Europe. He Holds a MEng in Electronics & Computer Engineering, an MSc in Digital Communication Systems and a PhD in Digital Signal Processing Techniques for Communication Systems. Prior to his engagement at ERTICO, he was heading INLECOM IoT and security division and he was the project manager for SELIS, a flagship EU program in T&L. He has served as the International Programs Director at INTRACOM Defence Electronics, and as the General Manager of INFITHEON Technologies overseeing the development of Technologies, Products and execution of European R&D programs and ESA projects and the development of disruptive smart IoT security products. Nikos has, more than twenty-year experience in senior R&D positions, in the areas of Wireless Communication Technologies, Digital Signal Processing for Communication systems, Wireless Sensor Networks (WSN), IoT, embedded Security Systems, and Cryptography. He holds a patent for an Autonomous VSAT System, a patent for an Integrated Security System, a Patent on Content based Routing, and he is a senior visiting Research Fellow at Cranfield University.

His tasks are as follows:

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

Specifically for Deliverables, the final consolidated review of each Deliverable is conducted by the Quality Manager. He is responsible for collecting all feedback from all individual (internal and external) peer reviews, consolidate them in one consolidated form for the author(s) that are sent to them for finalising their Deliverable and addressing the comments listed, providing for each revision made according to them an answer, as listed in the peer review template of Appendix V.

During this consolidation process, the Quality Manager should also focus on the following aspects:

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

In addition, the Quality Manager is responsible for checking/ensuring that the final Deliverable returned by the author(s) upon the peer review comments are conforming to the consolidated peer review comments and, if not, a proper justification is provided in the author(s) response part of the form.

Also, the Quality Manager is responsible for monitoring the overall process and managing the relevant documentation in the Cooperation Tool as defined in section 6.6.

6.4.2 Peer Review by internal experts

The internal peer reviewers have to review each Deliverable (they are assigned with according to Appendix II) with respect to the following topics, concluding, finally, whether the Deliverable is accepted or not.

General comments

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

Specific comments

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

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

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

6.4.3 Peer Review by external experts

Certain *high importance* deliverables will go through an additional external review process by the Advisory Board members in addition to the internal peer review. In Appendix II, it is defined which Deliverables will be externally peer reviewed by the Advisory Board. As soon as the Deliverable is sent for peer review by the author(s), the Quality Manager is responsible to send it also to the Advisory Board members selected in each case and include their returned comments, in the consolidated peer review form.

The external review, to be conducted by the Advisory Board experts will be requested to focus in addition to the standard elements to the following:

- **Level of innovation**
  - Is the report at the cutting edge of the market?
- **Technical content focused review**
  - Content with regards to the objectives of the deliverable
  - Well-founded argumentation
- **Structure**
  - Logical structure and organisation
- **Clarity and straightforwardness**

6.4.4 Review to be conducted by the Technical Management team

In addition to the internal peer reviewers, the technical management team, led by the Technical and Innovation Manager, Dr Evangelos Bekiaris, also reviews each Deliverable upon the following principles:

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

6.4.5 Review by the Project Coordinator and submission

The final stage before submission of the Deliverable is its final check by the project Coordinator (UITP) upon receipt by the author and confirmation by the Quality Manager (ERTICO) that it is ready for submission.

The Coordinator quickly reviews the document and if it has no objection, proceeds with the submission of an electronic copy to the EC via the online Funding & Tender Opportunities Portal within the appropriate timeframe and in the necessary format.

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

6.5 Deliverable peer review process

The SHOW Consortium has to reach a common understanding that the Deliverables are the tangible outcomes of the project and, as such, they have to be of the highest quality possible. This is upon the responsibility of the Quality Manager and the Project Management Team to convey this message to all beneficiaries and assure that this is indeed the case in the project duration. The quality processes defined in this document is a control measure towards the achievement of this goal. In this context, Deliverable Author(s) but also peer reviewers have to respect some basic rules and avoid frequent mistakes, as listed in the sections of the current chapter. The exact stepwise process to be followed for the peer review process is as follows:

1. The Deliverable Main Author issues the provisional ToC of the Deliverable and uploads in the respective folder of the Cooperation Tool, **4 months before the final deadline provided in the G.A.**, notifying the PMT, the respective Activity and WP leader.
2. As soon as the ToC is agreed, the Deliverable main Author shares responsibilities among participants/Co-Authors and monitors progress of contributions along with the respective Activity and WP leaders, with a notification to the PMT.
3. The Deliverable Main Author, in agreement and collaboration with the other Co-Authors, iteratively and progressively updates purpose, audience and ToC as well as content.
4. **Two months before the official deadline of the Deliverable**, a complete draft is sent out by the Deliverable main Author for internal (to the WP) comments and revision with a notification to the PMT.
5. **One month before the official deadline of the Deliverable**, the Deliverable lead author uploads the draft Deliverable for peer review in the respective folder of the Cooperation Tool and notifies respectively the Quality Manager.
6. **The Quality Manager** informs respectively the internal and external peer reviewers as well as the Technical Manager that the **peer review process** can start, **giving 15 calendar days for this.**

7. All assigned peer reviewers have to return the peer review form with their comments in the given timeframe and the Quality Manager **consolidates** them using the respective form **(Appendix V)** and provides them to the lead author(s).
8. **The lead author(s) are responsible to return the Deliverable back** together with their response to the comments **in one week time (Appendix V) acknowledging to the Quality Manager and the whole PMT.**
9. **The Quality Manager checks conformity in two calendar days** and acknowledged the Coordinator.
10. **The Coordinator reviews in one calendar day and proceeds with submission**, acknowledging to the whole Consortium the submission of the Deliverable.

It should be also noted that in order to ensure the timely submission and safeguard the high quality of the 82, in total, SHOW deliverables, the Peer review process has been strengthened even further: An extra measure has been injected in the process between steps 9 and 10. A final review check is performed by the Technical and Innovation Manager (CERTH/HIT) before the Coordinator final review and submission.

If a non-conformity issue is noticed in steps 9 and/or 10, the Quality Manager/Coordinator request the author(s) for corrective actions before closing the Deliverable.

6.6 Monitoring and List of Deliverable Reviewers

The deliverable preparation and review process are continuously monitored by the Quality Manager, as mentioned in section 6.4.1, to ensure the timeline is kept and the risks are minimised. In order to keep deadlines and deliverables status up to date, there will be a working document on the Cooperation Tool, that keeps up to date information regarding Deliverables due dates, reviewers assigned to them, status of peer review completion and submission. The Quality Manager (ERTICO) manages and monitor this working document in continuous collaboration with the deliverable leaders.

6.7 Common s/w and tools

The main software tools and standards have been defined as follows for the project (for common use):

- Operating Systems: Windows 8, 10, Mac OS X 10.10 or later, Linux stable distros
- MS Office 2010 or later for
  - Textual Deliverable (MS-Word)
  - Textual Deliverable support, cost statements (MS-EXCEL)
  - Transparencies, Slides, Posters (MS-POWERPOINT)
- Google Docs and OneDrive (latest version)
- GoToMeeting (latest version)
- GoToWebinar (latest version)
- Cooperation Tool (latest version)
- Microsoft Teams (latest version)
- Microsoft SharePoint (latest version)
- All operating systems and tools compliable with the aforementioned

7. Project Risk Management

The work on risk identification commenced during the proposal preparation phase and it has continued since then as it is a key task for the SHOW Project. All project governance related risks and mitigation measures are and will be addressed as part of the Risk Management procedure of the project.

The Risk Management procedure defines how risks have been and will be identified, assessed, controlled and communicated upon the following methodology:

1. **Identify** the risks that could affect the project (threats and opportunities). Risks are recorded in the current Risk Management Plan that is updated on annual basis through the form provided in Appendix III. New risks can be added at any time during the project life-time and can be included in the risk register accessible to all project partners.
2. **Assess** the risks in terms of their probabilities, impact and proximity (the likelihood of the risk happening and the impact of the risk on the project if it happens).
3. **Plan** the specific responses to the threats (to help reduce or avoid the threat), and/or opportunities (to maximize the opportunities) if the risks happens.
4. **Implement** the planned responses if risks occur, appoint Risk owners and Risk actions.

Those four interlinked elements are constantly monitored by the Quality and Risk Manager (ERTICO) and communicated by the Project Coordinator to ensure an effective communication among the Consortium members and EC through:

- Update of the risk register (internally with the contribution of all Activity leaders and then in the respective table of the Participant Portal)
- Regular status reports – in Periodic Reports on 6 month basis
- Annual formal project risk assessment (tackling management and strategic risks; not technical ones)
- Lessons learnt log/report

Table 12 below presents a list of strategic and management risks which could pose a threat to the SHOW project in fully achieving one or more of its objectives, and a corresponding mitigation strategy for each of these risks. As mentioned above, those will be revisited in the context of the risk assessment plan.

Table 12: Risks at project level.

Risk No	Description of risk	Probability/Impact	Proposed risk-mitigation measures	Materialisation status
1.	Defaulting partners	Low/Major	Consortium encompasses multiple OEM's and operators (even at pilot site level), research performers, Cities and Authorities (including over 60 connected through LoS and ready to enter the Consortium - if needed) minimizes the risks of defaulting Partners or Parties leaving the Consortium.	This risk has been indeed materialised. "Defaulting" in this case so far implies Partners that have withdrawn for several reasons. Indeed, as it has been explained, the project management team has put in force all the formal processes in place to address each of those cases. The key principle has been based indeed on the mitigation strategy identified, according to which, solutions were sought initially internally to the Consortium and this

Risk No	Description of risk	Probability/Impact	Proposed risk-mitigation measures	Materialisation status
				indeed has proved to be a successful strategy.
2.	Delays due to failing partners	Low/Major	The buffer of 25 months for pilot performance for 12 months real-life scenario is expecting to absorb any occurring delays. SHOW Risk Management comprises a combination of tools and processes that identify monitor and help creating an answer to the risks.	Indeed, this risk has been already materialised. In this context, the overall timeline of the project has been slightly adjusted (see section 3.2). Indeed the mitigation strategy has proved to be the correct one as, despite the delays expected, the final goal still seems achievable with so far no requirement for shifting the project end date.
3.	Conflicts in the consortium	Low/Major	PMT and PCG will maintain constant and open communication channels to ensure that no conflicts will occur, or in case they do to ensure adequate mediation and resolve between the conflicting partners according to the set procedure.	Not materialised in any sense so far.
4.	Consortium agreement negotiation. One or more beneficiary do not agree and sign the consortium agreement.	Low/Moderate	The Consortium Agreement has been negotiated at great length and partners have or are about to sign it.	Not materialised.
5.	Contact person change, project manager or WP leader change	Medium/ Moderate	Project Participants are large Organizations and reputable entities and business continuity is ensured to a large extent. The Project Management Team is continuously monitoring for such changes to ensure continuity.	It has been naturally materialised; the full contact list of the project is constantly changing and the governance team of the project has achieved to successfully monitor this through the respective mechanisms it has put in place from the early beginning of the project.
6.	Delays in processing payments e.g., due to lack of sufficient information from partners	Low/Moderate	Project Coordinator will minimise such occurrences by ensuring timely collection of all (not only financial) information from the partners.	Not materialised.
7.	Delays in submitting deliverables and reports	Medium/ Moderate	Through the set procedure regarding Deliverables preparation and submission such delays (if any) will be kept to a minimum.	Indeed, any delays noticed so far and due to the effort of both all the authors but also of the management team, have been restricted to the minimum. The official shifts of some deliverables to later dates have been

Risk No	Description of risk	Probability/Impact	Proposed risk-mitigation measures	Materialisation status
				done due to technical reasons.
8.	Deliverables do not achieve the expected quality	Low/Major	Through the set quality procedure regarding Deliverables preparation and submission such occurrences (if any) will not materialise.	Materialised in some cases at the phase of the internal review of deliverables; the Management Team believes that this has been addressed quite successfully through the peer review process put in place and that the deliverables finally released and submitted conform to standards.
9.	Ineffective collaboration among work packages	Low/Moderate	SP leaders will ensure that WP leaders will collaborate effectively at SP level, and report to the Project Management Team and the Project Core Group any collaboration issues so that they can intervene if needed.	The risk is not materialised so far; still the mitigation strategy has been applied on proactive basis.
10.	Non-engagement of major stakeholders and interest groups	Medium/Moderate	Identification and analysis of stakeholder and interest groups and intensification of planned targeted engagement and dissemination actions in the related project activities.	The risk is not materialised so far; still the mitigation strategy has been applied on proactive basis.
11.	Poor visibility of the impacts and benefits of the project	Low/ High	Pro-active, timely and planned communication and dissemination actions throughout the duration of the project.	The risk is not materialised so far; still the mitigation strategy has been applied on proactive basis.
12.	Innovations (in solutions and methodologies) are not sufficiently utilized or are not evident enough	Low/Moderate	Facilitate change and strengthen the development of innovative ideas, working modes and methodologies by all beneficiaries. Tighter management on project, SP and WP and pilot site level to achieve a common understanding and vision on behalf of the Consortium.	The risk is not materialised so far; still the mitigation strategy has been applied on proactive basis.
13.	Failure/loss of internal communication/awareness of project activities	Low/Medium	The Project Coordinator and PCG will ensure that relationships are maintained with all the partners throughout the project cycle. Tight management on each level.	The risk is not materialised so far; still we proactively took action and set a monthly Internal Newsletter in which admin matters, technical progresses, and events are shared with the consortium.
14.	COVID-19 induced delays	Medium/high	Project Coordinator, Technical Manager, Risk Manager and the PCG are monitoring for potential	This risk has materialised since COVID has brought considerable delays to work routines of partners,

Risk No	Description of risk	Probability/Impact	Proposed risk-mitigation measures	Materialisation status
			occurrences and will take the required measures, including re-scheduling and re-arranging workload balance and sequence, if necessary on a case-by-case basis. Clear census of the status will be feasible close to the physical conclusion of the pandemic (hopefully around M24).	in-field works as well as to bureaucratic processes that influence directly the progress of the project in all senses but especially in whatever is concerning field operations and demonstrations. More specifically, Activities in which events or workshops were planned were affected by the travel restrictions, for instance A15.6 Standardization and certification and A Stakeholder Forum, major event and demo event organisation, where face-to-face communication usually allow raising awareness of the SHOW project. Events had to be held remotely with restricted schedules and thus, potentially less impacts on subsequent project dissemination actions.
15.	Consortium Cohesion/sync of project activity streams	Medium	SHOW is a large project with a very wide scope and many moving parts. The Project Coordinator, Technical Manager and the PCG will ensure that the various project streams move in sync and at the right pace	Mitigation actions and various project streams have been applied in order to sync the activities in the consortium, e.g., with the implementation of a monthly Internal Newsletter in which admin matters, main technical progresses, and events are shared with the consortium. The PMT also used interactive tools during virtual meetings (e.g., MURAL), to enhance cohesion and compensate the lack of face-to-face interactions (cf. Risk No 14).

The first formal and in-depth risk assessment on technical grounds has been conducted, prior to the technical validation phase of the project, using an extended FMEA methodology in the context of *A4.6: Risk Assessment*, led by CERTH/HIT.

As a starting point the risks identified in the GA have been used, which have been updated by the whole Consortium, resulting to the identification of about 40 risks in total (24 of which were existing ones). Risks recognised are either technical, behavioural, legal/regulatory, operational or pilot/demonstration related and have been considered and analysed towards their severity, occurrence probability, detectability and recoverability, while their overall risk level has been finally calculated.

The technical risks identification is also a living process in the project involving all Partners; their final assessment is held by the Project Core Group members. The

outcomes of this first risk assessment phase in SHOW are reported in detail in *D4.1: Open modular system architecture and tools - first version* that has been submitted in M14, while the update of the technical risk assessment is currently in progress.

8. Conclusions

The current document stands for *D14.5: SHOW Project Management plan, Quality Assurance & Risk Assessment Plan – Second update*.

Most of the sections in this document come from *D14.1: SHOW Project Management plan, Quality Assurance & Risk Assessment Plan* (submitted M03) and have been updated in D14.4 (submitted in M18), where applicable. Further updates and revisions have been made in *D14.5: SHOW Project Management, Quality Assurance & Risk Assessment Plan second update* due for M30 in order to appropriately reflect changes in project governance, operational, quality and risk processes as well as to capture corrective actions undertaken, if any, in order to meet the project plan. Still, the core of the Deliverable remains valid throughout the project duration.

The project Inception Report that has been delivered in the first 6 months of the project should be seen as complementary to this Deliverable.

References

1. SHared automation Operating models for Worldwide adoption (SHOW) Grant Agreement 875530, Innovation Action, Innovation and Networks Executive Agency, European Commission.

Appendix I – Deliverable template

SHared automation Operating models for Worldwide adoption

SHOW

Grant Agreement Number: 875530

Del.ID: Deliverable title

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement no 875530

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Executive Summary

This is the section, where an overview of the Deliverable content is provided. The outline of the specific goals and achievements have to be added in short. Also, a summary of the content of the main Chapters of the Deliverable has to be added.

Document Control Sheet

Start date of project:	01 January 2020
Duration:	48 months
SHOW Del. ID & Title:	e.g. Deliverable 14.1: SHOW Project Management Plan, Quality Assurance and Risk Assessment Plan
Dissemination level:	As defined in the G.A. E.g. PU (for Public), CO (for Confidential), etc.
Work package:	e.g. WP14
Lead authors:	e.g. Guido di Pasquale (UITP)
Other authors involved:	e.g. Evangelos Bekiaris (CERTH/HIT), Nikolaos Tsampieris (ERTICO)
Internal Reviewers:	According to Appendix II
External Reviewers:	According to Appendix II
Due submission date:	DD/MM/YYYY (Mx)
Actual submission date:	DD/MM/YYYY (Mx)
Status:	DRAFT; FINAL; SUBMITTED; APPROVED
File Name:	SHOW_ Del.ID_Short name_version_lead author e.g. SHOW D14.1_Project Management Plan_v1_UITP

Document Revision History

Version	Date	Reason	Editor
0.1	DD/MM/YYYY	e.g. Table of Contents for feedback.	e.g. Guido di Pasquale (UITP)
…			
1.0	DD/MM/YYYY	Version sent for internal peer review.	
2.0	DD/MM/YYYY	Peer reviewed version sent for submission.	

Table of Contents

List of Tables

List of Figures

Abbreviation List

Abbreviation	Definition

1. Introduction

1.1. Purpose and structure of the document

The goal of the document in 2-3 sentences.

1.2. Intended Audience

Type of Audience addressed (e.g. developers, stakeholders, etc.) - internal & external to the Consortium – and why the document would prove useful to them.

1.3. Interrelations

Which are the internal interrelations to other WPs/Activities. Or, also, which are the external interrelations; to platforms, initiatives, etc.

2. Methodological Approach

If applicable to the Deliverable; not applicable for Managerial deliverables.

3. Main Chapter of the Deliverable

3.1 Heading 2

3.1.1 Heading 3

3.1.1.1 Heading 4

4. Main Chapter of the Deliverable

Table 13: Caption of table.

Label	Label	Label	Label

Figure 9: Caption of Figure (similarly for diagrams, pictures, etc. but creating a dedicated list of elements at the frontal part of the Deliverable).

5. Main Chapter of the Deliverable

6. …

7. Conclusions

References

Using APA reference guide for references

https://libguides.murdoch.edu.au/APA/all

Appendix II - Deliverables list, delivery month and assigned peer reviewers

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
D1.1	Ecosystem actors' needs, wants & priorities & user experience exploration tools	WP1	VEDECOM	**M6 (30 June 2020)**	DLR	VTI		**M5 (31 May 2020)**	**1-15 June 2020**
D1.2	SHOW Use Cases	WP1	CERTH	**M9 (30 September 2020**)	NAVYA	MOVIA		**M8 (31 August 2020)**	**1-15 September 2020**
D1.3	Stakeholder & travellers needs evolution through Pilots	WP1	VEDECOM	**M42 (30 June 2023)**	DLR	VTI		**M41 (31 May 2023)**	**1-15 June 2023**
D2.1	Benchmarking of existing business / operating models & best practices	WP2	IESTA	**M9 (30 September 2020**	VUB	VEDECOM		**M8 (31 August 2020)**	**1-15 September 2020**
D2.2	Proposed business / operating models & mapping to UCs and Pilot sites	WP2	T-Systems	**M12 (31 December 2020)**	KEOLIS	Wiener Linien		**M11 (30 November 2020)**	**1-15 December 2020**
D2.3	First version of validated business/ operating models	WP2	VEDECOM	**M30 (30 June 2022)**	RISE	ID4CAR		**M29 (31 May 2022)**	**1-15 June 2022**
D2.4	Final validated business / operating models	WP2	VEDECOM	**M44 (31 August 2023)**	E-TRIKALA	CTLUP		**M43 (31 July 2023)**	**1-15 August 2023**
D2.5	Scalability and transferability of	WP2	Bax & Company	**M44**	EUROCITIES	LINKS		**M43**	**1-15 August 2023**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
	business / operating models			**(31 August 2023)**				**(31 July 2023)**	
D3.1	Analysis report on legal, regulatory, institutional frameworks	WP3	AUSTRIATECH	**M12 (31 December 2020)**	DLR	IDIADA		**M11 (30 November 2020)**	**1-15 December 2020**
D3.2	SHOW Ethics manual & Data Protection Policy	WP3	VTI	**M5 (31 May 2020)**	VTT	TNO		**M4 (30 April 2020)**	**1-15 May 2020**
D3.3	Recommendations for Adapting Regulatory and Operational Strategies for CCAV deployment at Local and Regional Level	WP3	EUROCITIES	**M30 (30 June 2022)**	ERTICO	UITP	√	**M29 (31 May 2022)**	**1-15 June 2022**
D3.4	SHOW updated Ethics manual & Data Protection Policy and Data Privacy Impact Assessment	WP3	VTI	**M12 (31 December 2020)**	VTT	TNO		**M11 (30 November 2020)**	**1-15 December 2020**
D3.5	Final SHOW Ethics manual, Data Protection Policy and Data Privacy Impact Assessment	WP3	VTI	**M24 (31 December 2021)**	CERTH/HIT	ERTICO		**M23 (30 November 2021)**	**1-15 December 2021**
D4.1	Open modular system architecture and tools - first version	WP4	ICCS	**M12 (31 December 2020)**	EAB	BOSCH		**M11 (30 November 2020)**	**1-15 December 2020**
D4.2	SHOW dashboard	WP4	RISE	**M17**	CERTH/HIT	TRANSDEV		**M16**	**1-15 May 2021**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
				(31 May 2021)				**(30 April 2021)**	
D4.3	Open modular system architecture – second version	WP4	ICCS	**M24 (31 December 2021)**	EAB	BOSCH		**M23 (30 November 2021)**	**1-15 December 2021**
D4.4	Open modular system architecture – third version	WP4	ICCS	**M36 (31 December 2022)**	EAB	BOSCH		**M35 (30 November 2022)**	**1-15 December 2022**
D5.1	SHOW Big Data Collection Platform and Data Management Portal	WP5	CERTH	**M12 (31 December 2020)**	RISE	DTU		**M11 (30 November 2020)**	**1-15 December 2020**
D5.2	Big Data & AI toolboxes	WP5	CERTH	**M18 (30 June 2021)**	AVL	VIF		**M17 (31 May 2021)**	**1-15 June 2021**
D5.3	CCAM enhanced services based on Big Data and AI	WP5	DTU	**M30 (30 June 2022)**	AIT	FZI		**M29 (31 May 2022)**	**1-15 June 2022**
D5.4	Final big data platform, tools and AI services	WP5	CERTH	**M40 (30 April 2023)**	RISE	DTU		**M39 (31 March 2023)**	**1-15 April 2023**
D6.1	SHOW Marketplace and services – first version	WP6	CERTH	**M22 (31 October 2021)**	TRANSDEV	RNV		**M21 (30 September 2021)**	**1-15 October 2021**
D6.2	SHOW Marketplace and services – second version	WP6	CERTH	**M30 (30 June 2022)**	VEDECOM	SWARCO		**M29 (31 May 2020)**	**1-15 June 2022**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
D6.3	SHOW Marketplace and services – final version	WP6	CERTH	**M40 (30 April 2023)**	ATE	ITML		**M39 (31 March 2023)**	**1-15 April 2023**
D7.1	AV demonstrators first version	WP7	NAVYA	**M16 (30 April 2021)**	TECNALIA	CERTH/HIT		**M15 (31 March 2021)**	**1-15 April 2021**
D7.2	Optimal control and handover strategies	WP7	ICCS	**M20 (31 August 2021)**	NAVYA	EASYMILE		**M19 (31 July 2021)**	**1-15 August 2021**
D7.3	Interfaces to non-equipped participants	WP7	CERTH	**M22 (31 October 2021)**	VALEO	NAVYA		**M21 (30 September 2021)**	**1-15 October 2021**
D7.4	AV final demonstrators	WP7	NAVYA	**M24 (31 December 2021)**	CERTH/HIT	TRANSDEV		**M23 (30 November 2021)**	**1-15 December 2021**
D8.1	Criteria catalogue and solutions to assess and improve physical road infrastructure	WP8	AIT	**M16 (30 April 2021)**	TNO	ATE		**M15 (31 March 2021)**	**1-15 April 2021**
D8.2	Solutions for onsite digital and Communication infrastructure	WP8	CEA	**M20 (31 August 2021)**	VIF	JRC		**M19 (31 July 2021)**	**1-15 August 2021**
D8.3	Solutions for collaborative TM	WP8	SWARCO MIZAR	**M24 (31 December 2021)**	LINKS	ATE		**M23 (30 November 2021)**	**1-15 December 2021**
D9.1	Evaluation framework	WP9	VTI	**M6 (30 June 2020)**	TNO	CERTH/HIT		**M5 (31 May 2020)**	**1-15 June 2020**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
D9.2	Pilot experimental plans, KPIs definition & impact assessment	WP9	VTI	**M11 (30 November 2020)**	JRC	VTT		**M10 (31 October 2020)**	**1-15 November 2020**
D9.3	Pilot experimental plans, KPIs definition & impact assessment framework for final demonstration round	WP9	VTI	**M22 (31 October 2021)**	JRC	VTT		**M21 (30 September 2021)**	**1-15 October 2021**
D9.4	Users engagement and co-creation initiatives	WP9	EPF	**M42 (30 June 2023)**	MOVIA	SITOWISE		**M41 (31 May 2023)**	**1-15 June 2023**
D10.1	Simulation scenarios and tools	WP10	FZI	**M10 (31 October 2020)**	VIF	NTUA		**M9 (30 September 2020)**	**1-15 October 2020**
D10.2	Pilot guiding simulation results	WP10	NTUA	**M22 (31 October 2021)**	TNO	VTI		**M21 (30 September 2021)**	**1-15 October 2021**
D10.3	Requirements for AV fleets operation simulation suite and first evidence on pilot results based simulations for impact assessment	WP10	NTUA	**M30 (30 June 2022)**	VTT	FZI		**M29 (31 May 2020)**	**1-15 June 2022**
D10.4	Pilot results based simulations for impact assessment	WP10	NTUA	**M44 (31 August 2023)**	VUB	IDIADA		**M43 (31 July 2023)**	**1-15 August 2023**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
D10.5	AV fleets operation simulation suite	WP10	VIF	**M46 (31 October 2023)**	ICCS	JRC		**M45 (30 September 2023)**	**1-15 October 2023**
D11.1	Technical validation protocol	WP11	IDIADA	**M18 (30 June 2021)**	VALEO	IRIZAR		**M17 (31 May 2021)**	**1-15 June 2021**
D11.2	Demos safety, reliability and Robustness validation and commissioning	WP11	JRC	**M22 (31 October 2021)**	NAVYA	OBJECTIVE		**M21 (30 September 2021)**	**1-15 October 2021**
D11.3	Pre-demo evaluation activities	WP11	FEV	**M24 (31 December 2021)**	CERTH/HIT	UITP		**M23 (30 November 2021)**	**1-15 December 2021**
D12.1	SHOW CCAV demonstrators progress	WP12	EUROCITIES	**M34 (31 October 2022)**	CERTH/HIT	UITP	√	**M33 (30 September 2022)**	**1-15 October 2022**
D12.2	French CCAV demonstrators	WP12	VEDECOM	**M42 (30 June 2023)**	DLR	MOVIA		**M41 (31 May 2023)**	**1-15 June 2023**
D12.3	German CCAV demonstrators	WP12	DLR	**M42 (30 June 2023)**	ATE	ID4CAR		**M41 (31 May 2023)**	**1-15 June 2023**
D12.4	Austrian CCAV demonstrators	WP12	AUSTRIATECH	**M42 (30 June 2023)**	EMT	SITOWISE		**M41 (31 May 2023)**	**1-15 June 2023**
D12.5	Swedish CCAV demonstrators	WP12	RISE	**M42 (30 June 2023)**	GTT	STIB		**M41 (31 May 2023)**	**1-15 June 2023**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
D12.6	Madrid CCAV demonstrators	WP12	TECNALIA	**M42 (30 June 2023)**	KTC	FEV		**M41 (31 May 2023)**	**1-15 June 2023**
D12.7	Satellite CCAV demonstrators	WP12	SITOWISE	**M42 (30 June 2023)**	RISE	VEDECOM		**M41 (31 May 2023)**	**1-15 June 2023**
D12.8	Follower sites multiplication plans and actions	WP12	EUROCITIES	**M44 (31 August 2023)**	E-TRIKALA	IRF	√	**M43 (31 July 2023)**	**1-15 August 2023**
D12.9	Real life demonstrations pilot data collection and results consolidation	WP12	VTT	**M44 (31 August 2023)**	CERTH/HIT	NTUA		**M43 (31 July 2023)**	**1-15 August 2023**
D13.1	SHOW impact assessment on road safety	WP13	NTUA	**M44 (31 August 2023)**	TNO	VTT	√	**M43 (31 July 2023)**	**1-15 August 2023**
D13.2	SHOW impact assessment on traffic efficiency, energy and environmental impact assessment	WP13	TNO	**M44 (31 August 2023)**	SWARCO	CERTH/HIT		**M43 (31 July 2023)**	**1-15 August 2023**
D13.3	SHOW impact assessment on society	WP13	Bax & Co	**M44 (31 August 2023)**	UITP	EPF	√	**M43 (31 July 2023)**	**1-15 August 2023**
D13.4	SHOW impact assessment on logistics	WP13	CTLUP	**M44 (31 August 2023)**	SWARCO	LINKS		**M43 (31 July 2023)**	**1-15 August 2023**
D13.5	SHOW impact assessment on user experience, awareness and acceptance	WP13	DLR	**M44 (31 August 2023)**	AVL	VEDECOM		**M43 (31 July 2023)**	**1-15 August 2023**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
D13.6	Overall impact assessment and cross pilot comparisons	WP13	VUB	**M46 (31 October 2023)**	CERTH/HIT	VTI		**M45 (30 September 2023)**	**1-15 October 2023**
D14.1	SHOW Project Management, plan Quality Assurance & Risk Assessment Plan	WP14	UITP	**M3 (31 March 2020)**	N/A (internal feedback will have been collected from the Management Team)				**M2 (29 February 2020)**
D14.2	Data Management Plan (DMP) – 1st version	WP14	ERTICO	**M6 (30 June 2020**	ICCS	TECNALIA		**M5 (31 May 2020)**	**1-15 June 2020**
D14.3	DMP – final version	WP14	ERTICO	**M24 (31 December 2021)**	CERTH/ITI	ICCS		**M23 (30 November 2021)**	**1-15 December 2021**
D14.4	SHOW Project Management, Quality Assurance & Risk Assessment Plan first update	WP14	UITP	**M18 (30 June 2021)**	N/A (internal feedback will have been collected from the Management Team)				**M17 (31 May 2021)**
D14.5	SHOW Project Management, Quality Assurance & Risk Assessment Plan second update	WP14	UITP	**M30 (30 June 2022)**	N/A (internal feedback will have been collected from the Management Team)				**M29 (31 May 2020)**
D15.1	Dissemination and Communication Plan	WP15	ERTICO	**M6 (30 June 2020**	UITP	CERTH/HIT		**M5 (31 May 2020)**	**1-15 June 2020**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
D15.2	Dissemination material and mechanisms of the project	WP15	ERTICO	**M6 (30 June 2020**	N/A (internal feedback will have been collected by the whole Consortium)				**M5 (31 May 2020)**
D15.3	Project video	WP15	ERTICO	**M24 (31 December 2021)**	N/A (internal feedback will have been collected by the whole Consortium)				**M23 (30 November 2021)**
D15.4	Dissemination and Communication Plan update and activities	WP15	ERTICO	**M24 (31 December 2021)**	UITP	CERTH/HIT		**M23 (30 November 2021)**	**1-15 December 2021**
D15.5	Dissemination material and mechanisms of the project – updated	WP15	ERTICO	**M24 (31 December 2021)**	N/A (internal feedback will have been collected by the whole Consortium)				**M23 (30 November 2021)**
D15.6	SHOW dissemination and communication activities	WP15	ERTICO	**M48 (31 December 2023)**	ICCS	VTI		**M47 (30 November 2023)**	**1-15 December 2023**
D15.7	Training, replication and transferability activities	WP15	IRF	**M48 (31 December 2023)**	EPF	UITP		**M47 (30 November 2023)**	**1-15 December 2023**
D15.8	Standardisation: alignment, contribution and activities	WP15	ERTICO	**M48 (31 December 2023)**	BOSCH	JRC	√	**M47 (30 November 2023)**	**1-15 December 2023**
D15.9	Final project video	WP15	ERTICO	**M48 (31 December 2023)**	N/A (internal feedback will have been collected from the Management Team)				**M47 (30 November 2023)**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
D16.1	Market analysis	WP16	EUMO	**M12 (31 December 2020)**	IESTA	Bax & Co		**M11 (30 November 2020)**	**1-15 December 2020**
D16.2	First version of business and exploitation plans	WP16	T-Systems	**M30 (30 June 2022)**	SENSIBLE	EMT		**M29 (31 May 2020)**	**1-15 June 2022**
D16.3	Final business and economic assessment and exploitation plans	WP16	T-Systems	**M48 (31 December 2023)**	Bax & Co	COMBITECH		**M47 (30 November 2023)**	**1-15 December 2023**
D17.1	First issue of best practices and decision making mechanisms for different stakeholder groups	WP17	IESTA	**M35 (30 November 2022)**	UITP	IRF		**M34 (31 October 2022)**	**1-15 November 2022**
D17.2	Best practices for Implementation and application guidelines for Industry, Operators and Cities	WP17	IESTA	**M46 (31 October 2023)**	KEOLIS	BALLERUP	√	**M45 (30 September 2023)**	**1-15 October 2023**
D17.3	Cities and Authorities decision making mechanisms	WP17	NTUA	**M46 (31 October 2023)**	e-TRIKALA	EUROCITIES		**M45 (30 September 2023)**	**1-15 October 2023**
D17.4	CCAV integration in SUMP	WP17	EUROCITIES	**M46 (31 October 2023)**	UITP	EPF	√	**M45 (30 September 2023)**	**1-15 October 2023**
D17.5	SHOW Roadmap towards CCAV	WP17	UITP	**M46**	EUROCITIES	IRF	√	**M45**	**1-15 October 2023**

Del. ID	Deliverable name	WP ID	Author	Delivery date	1st Reviewer	2nd Reviewer	Additional review by the Advisory Board	Delivery date of peer review version from authors	Peer review time slot for peer reviewers
	implementation in cities and policy recommendations			**(31 October 2023)**				**(30 September 2023)**	
D18.1	POPD - H - Requirement No. 1	WP18	VTI	**M5 (31 May 2020)**	N/A (internal feedback will have been collected from the Management Team)				**M4 (30 April 2020)**
D18.2	POPD – Requirement No. 3	WP18	VTI	**M5 (31 May 2020)**	N/A (internal feedback will have been collected from the Management Team)				**M4 (30 April 2020)**

Appendix III - Critical risks and mitigation actions

Risk number	Description of risk	WP number	Proposed risk-mitigation measures	Materialisation status
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Appendix IV – Internal Reports template

SHared automation Operating models for Worldwide adoption

SHOW

Grant Agreement Number: 875530

Internal Report: ¨Title of the report¨

Work package	WPx: Title
Activity	ActivityX.X: Title
Internal Report	Internal Report name
Author(s)	
Status	Choose an item.
Version	X.X
Document date	00/00/2017
	This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement no 875530.

Document Control Sheet

Version history table			
Version	**Date**	**Modification reason**	**Modifier**

Excerpt

<Rest items as in Deliverable template>

Appendix V – Consolidated Peer Review template

SHared automation Operating models for Worldwide adoption

SHOW

Grant Agreement Number: 875530

Consolidated Peer Review Report

Deliverable No.		Deliverable Title	
Deliverable Authors			
Quality Assurance Manager		**Nikolaos Tsampieris (ERTICO)**	
Workpackage No.	**WPy**	Workpackage Title	
Activity No.	**Ak.z**	Activity Title	
Date of Review:			
File Name:			

REVIEWERS

Nikolaos Tsampieris (Quality Manager) – ERTICO

Mr/Ms Y (Quality expert) – Company name

Mr/Ms Y (Quality expert) – Company name

External Reviewer:

OVERALL PEER REVIEW RESULT

Deliverable is:

☐ Fully accepted	☐ Accepted with reservation	☐ Rejected unless modified as suggested	☐ Fully rejected

Please provide an overall rating of this deliverable in a scale from 1 (very poor) to 10 (excellent): _____

SUMMARY OF SUGGESTED ACTIONS TO AUTHOR(S)

(Please note that they will be transmitted to the Author(s) and the European Commission)

1. The following changes should be implemented: ……

2. Specify missing chapters / subjects: ……..

3. Required changes on deliverable essence and contents: ……..

4. Further relevant required improvements: …….

COMMENTS OF PEER REVIEWERS

General comment *Referring to any issue not covered by the particular topics below.*
Specific comments
Topic A: Relevance. **Please answer the question: "Is this Deliverable relevant to SHOW and to the particular Activities / WP it covers?"** ***Reviewer comment*** ***Author(s) response***
Topic B: Response to user needs/requirements/specifications (if applicable) **Please examine the correlation of this Deliverable with the relevant user needs/requirements/specifications identified in SHOW, if relevant. "Does the Deliverable cover the prioritised User Needs or is it technology-driven?"** ***Reviewer comment*** ***Author(s) response***
Topic C: Methodological framework soundness **Please comment on the soundness of the methodology followed and how it is explained. "Are the results arbitrary or based upon a clear methodology, involving user tests, expert opinions, etc.?"** ***Reviewer comment*** ***Author(s) response***

Topic D: Quality of achievements **Please comment on the essence of the results. "Are they of high value? Are they what one should expect?"** ***Reviewer comment*** ***Author(s) response***
Topic E: Quality of presentation of achievements **Please comment on the results presentation. "Are the results adequately explained and commented or just listed? Is there a clear and established link between methodology and results?"** ***Reviewer comment*** ***Author(s) response***
Topic F: Deliverable Layout / Spelling / Syntax/ Format **Please comment on the Deliverables layout. "Does it include all necessary Chapters, is it readable, in comprehensive language, etc.?"** ***Reviewer comment*** ***Author(s) response***

Appendix VI – Meeting agenda template

SHared automation Operating models for Worldwide adoption

SHOW

Grant Agreement No 875530

Agenda

SHOW xxxxxxxxxxxxxxxxxx Meeting

Date:	
Venue:	City, Country
Organiser:	
Version:	Draft or Final
Contact Point:	

dd Month Year

Expected participants: ALL partners (or add a Table with participants and affiliation)

Time	Item	Presenter
	Welcome	
	Coffee break	
	Lunch break	
	Coffee break	

Time	Item	Presenter
	Closing of first day	

Appendix VII – Meeting minutes template

SHared automation Operating models for Worldwide adoption

SHOW

Grant Agreement No 875530

SHOW xxxxxxxxxxxxxxxxxx Meeting Minutes

Date:	dd Month Year
Venue:	City, Country
Issuer:	
Version:	Draft or Final

List of Participants

Project meeting agenda

Meeting minutes

Topic 1 (as of the Agenda)

text

Topic 2

text

List of actions

ID	Action	Who	Deadline	Status	Notes

Appendix VIII: Request for Corrective Action

SHared automation Operating models for Worldwide adoption

SHOW

Grant Agreement Number: 875530

Request for Corrective Action

WP:	**Activity:**
Requesting Participant:	
Number of request:	

No	Issue	Reasoning	Proposal for remedy	Deadline for remedy implementation

No	Issue	Reasoning	Proposal for remedy	Deadline for remedy implementation

Annex IX: Decision on Corrective Action request

SHared automation Operating models for Worldwide adoption

SHOW

Grant Agreement Number: 875530

Decision for Corrective Action

CORRECTIVE ACTION DECISION	**Number:**
Title:	**Date:**

SECTION 1: Description of issue

Relevant WP / Activity: .....

SECTION 2: Reasoning / Cause

SECTION 3: Immediate corrective action to be taken

To be implemented by ..... Date .....

SECTION 4: Follow Up Action and Effectiveness Monitor

List of Changes to be made:

1.

2.

3.

4.

5.

8.

The Corrective/Preventive Action has been completed and has/has not effectively cured the problem.

Further action has been requested on Corrective Action Request No.....