SUCCESS-6G: EXTEND – DEVISE - VERIFY

WP6 Deliverable E15

Interim report on dissemination, standardization, and exploitation activities

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Disclaimer

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Executive Summary

The key research objectives underpinning SUCCESS-6G reside in the design of a robust, secure, and computationally efficient framework that builds on the extracted knowledge from vehicular streams to offer: i) real-time vehicle condition monitoring and fault provisioning, and ii) over-the-air vehicular software updates in an autonomous manner. In the context of SUCCESS-6G, various communication and dissemination activities are foreseen, while the involved partners will also target to exploit the results through individual exploitation plans and standardization efforts.

This deliverable (E15) reports the dissemination, communication, and exploitation activities during the first year of the coordinated SUCCESS-6G project for the three subprojects: EXTEND, DEVISE, and VERIFY. In particular, this includes i) communication and dissemination activities, in terms of popular events, liaisons with other 6G-IA initiatives, scientific publications, etc.; ii) a standardization plan with targeted standardization bodies; and iii) an exploitation plan that includes the exploitation vision of the SUCCESS-6G partners.

The deliverable is structured in the following sections:

- Introduction
- Communication and Dissemination Activities
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- Exploitation Plan
- Conclusions

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1 Introduction

1.1 Purpose of this report

The SUCCESS-6G consortium aims at proactively disseminating the project's technical results to the main stakeholder communities expected to use or benefit from the project's outcomes. In this regard, several dissemination activities are being planned, via various communication channels. Dissemination activities target the public disclosure of the project results, including the novel SUCCESS-6G use cases, concept, architecture and algorithmic solutions, and the obtained results reflecting the achievable benefits. Furthermore, the SUCCESS-6G consortium will address relevant existing standards (to enable interoperability of the envisioned project's outcomes), as well as provide contributions to the ongoing development of new standards. Accordingly, within the SUCCESS-6G project organization, WP6 is responsible for dissemination, standardization, and outreach activities.

1.2 Methodology

The SUCCESS-6G consortium considers the dissemination and use of knowledge to be of core importance for creating technological, economic, and societal impact. The consortium partners apply the proven PDCA (plan-do-check-act) method for ensuring high quality and effectiveness of the SUCCESS-6G communication, dissemination and standardisation activities and results. This iterative methodology consists of four steps:

1. **Plan** – Based on the general project goals and the respective impact goals, the consortium will define the specific implementation steps for communication, dissemination, and standardisation activities as well as KPIs and target values for measuring success.
2. **Do** – The consortium will perform the planned communication, dissemination, and standardisation activities to achieve the envisaged results.
3. **Check** – The consortium will analyse performance and results against the KPIs, and target values defined in the planning phase.
4. **Act** – If the previous step reveals a gap between planned and actual performance, the consortium will analyse possible causes and develop measures for corrective action, which will feed into the next iteration of the planning step.

The iterations will correspond to the points in the process where measurable outcomes are to be expected. While the completion of activities (Do) and related monitoring (Check) are ongoing, corrective action (Act) and re-planning (Plan) will be driven by corrective needs identified while monitoring. For each dissemination action, the different types of the target audience (i.e., industry verticals, manufacturers and service providers, network operators, SMEs, open-source communities, SDOs, academia and research centres, and generic public) were identified. The dissemination strategy was adapted to each partner profile and role in the project. For example, it is expected that CTTC, as an academic and research center, will be mainly in charge of driving publications in journals and conferences and will conduct seminars. In turn, industrial partners will be expected to disseminate the project among their internal and external channels and will drive the relationships with external stakeholders.

2 Communication and Dissemination Activities

2.1 Objectives

The SUCCESS-6G project aims at maximizing the outcomes of its activities, by leveraging multiple communication channels. The dissemination and communication activities will be at the service of the whole project, aiming to:

- Ensure broad visibility and raise awareness about SUCCESS-6G by spreading knowledge about the project ambitions and its results.
- Reach, stimulate and engage a critical mass of relevant stakeholders to ensure that the results of the project are well-known and taken up, especially by vertical industries, to set up trials of innovative use cases.
- Foster high-impact contribution to relevant standardization bodies as appropriate and relevant to the planned exploitation plans and the project's outcomes.
- Facilitate the exploitation of the project's outcomes and promote the development of innovative solutions based on the new technologies introduced by SUCCESS-6G.
- Increase the public visibility of the project and its outcomes, using generalist communication channels to connect with non-technical audiences.

2.1.1 Tracking

Monitoring of the communication and dissemination activities will help the consortium members in identifying any potential problems with respect to the effectiveness of research activities, e.g., regarding the extent to which target audiences have been reached and engaged in a dialogue. As part of the project's PDCA methodology for managing communication and dissemination activities (see Section 1.2), SUCCESS-6G is giving special attention to monitoring and tracking dissemination activities. To this purpose, the project is using a shared Excel file in the Teams repository for dissemination tracking. It provides an easy overview on activities and results, and it facilitates the process of agreeing on dissemination documents.

2.2 Publications

SUCCESS-6G aims at disseminating the achieved research and innovation results in top-ranked scientific journals and magazines, as well as in international conferences and workshops. Table 1 summarizes the accepted papers pertinent to SUCCESS-6G research activities, while Table 2 provides details about their relevance to the SUCCESS-6G project.

Table 1: List of accepted scientific papers

ID	Paper	SUCCESS-6G partners
Scientific Journals		
J1	R. Sedar, C. Kalalas, F. Vazquez-Gallego, L. Alonso, J. Alonso-Zarate, "A Comprehensive Survey of V2X Cybersecurity Mechanisms and Future Research Paths," in IEEE Open Journal of the Communications Society, vol. 4, pp. 325-391, January 2023, doi: 10.1109/OJCOMS.2023.3239115	CTTC
J2	J. Camargo, E. Coronado, W. Ramirez, D. Camps, S. Sanchez Deutsch, J. Perez-Romero, A. Antonopoulos, O. Trullols, S. Gonzalez-Diaz, B. Otura, G. Rigazzi, "Dynamic Slicing Reconfiguration for Virtualized 5G Networks Using	NBC

	ML Forecasting of Computing Capacity", Computer Networks, vol. 236, September 2023, doi: 10.1016/j.comnet.2023.110001	
Conferences		
C1	R. Sedar, C. Kalalas, P. Dini, J. Alonso-Zarate, F. Vazquez-Gallego, “Misbehavior Detection in Vehicular Networks: An Ensemble Learning Approach", in Proc. of IEEE Global Communications Conference 2022 (IEEE Globecom ’22), Rio de Janeiro, Brazil, December 2022.	CTTC
C2	C. Manso, R. Vilalta, L. Gifre, R. Casellas, R. Martínez, R. Muñoz, “Introducing End-to-End Location Awareness in Packet-Optical Networks”, European Conference on Optical Communications, Glasgow (UK), 2023.	CTTC
C3	A. Pastore, S.H. Lim, C. Feng, B. Nazer, M. Gastpar, “Distributed Lossy Computation with Structured Codes: From Discrete to Continuous Sources”, 2023 IEEE International Symposium on Information Theory (ISIT), Taipei, Taiwan, June 25-30, 2023, pp. 1681-1686.	CTTC
C4	M. Dalgitsis, N. Cadenelli, M. A. Serrano, N. Bartzoudis, L. Alonso, A. Antonopoulos, "NSFaaS: Network Slice Federation as a Service in Cloud-native 5G and beyond Mobile Networks", IEEE NFV-SDN 2023, 7-9 November 2023, Dresden, Germany	NBC, CTTC

2.2.1 Relevance to SUCCESS-6G

Table 2: Relevance of publications to SUCCESS-6G activities

ID	Relevance
J1	This paper surveys current literature on vehicle-to-everything (V2X) security and provides a systematic and comprehensive review of the most relevant security enhancements to date. An in-depth classification of V2X attacks is first performed according to key security and privacy requirements. Our methodology resumes with a taxonomy of security mechanisms based on their proactive/reactive defensive approach, which helps identify strengths and limitations of state-of-the-art countermeasures for V2X attacks. In addition, this paper delves into the potential of emerging security approaches leveraging artificial intelligence tools to meet security objectives. Promising data-driven solutions tailored to tackle security, privacy and trust issues are thoroughly discussed along with new threat vectors introduced inevitably by these enablers. The lessons learned from the detailed review of existing works are also compiled and highlighted. A structured synthesis of open challenges and future research directions is finally provided to foster contributions in this prominent field. This work is part of WP3 research activities.
J2	This paper introduces an ML model that can predict slices’ traffic and dynamically reconfigure computational capacity. With these forecasting capabilities, the virtualized resources can be fine-tuned to suit the slices’ requirements, guaranteeing their Quality of Service (QoS). By doing so, Mobile Network Operators can make optimized use of the equipment, tailoring their needs to each service while complying with the QoS level. The results obtained demonstrate that the proposed ML model, in combination with a specific set of hysteresis rules, can accurately predict the saturation of virtualized capacity with up to 91% accuracy and proactively adapt it to the network slice requirements. This work contributes to the data-driven approaches that is part of WP3 activities.
C1	In this paper, we introduce a data-driven ensemble framework which jointly leverages clustering and reinforcement learning to detect misbehaviors in unlabeled vehicular data. A rigorous detection assessment using an open-source dataset reveals meaningful performance trends for various attacks. While the majority of attacks can be effectively

	detected, detection may be curtailed for certain misbehavior types due to partly inaccurate clustering and erratic activity of the attacker over time. Performance comparison against benchmark detectors reveals the robustness of our approach in the presence of potentially inconsistent or mislabeled training data. The real-time detection capabilities of our framework are also explored in an effort to evaluate its practical feasibility in mission-critical V2X scenarios. This work is part of WP3 research activities.
C2	This paper delves into End-to-End packet-optical connectivity services, with a particular focus on their deployment across the edge-cloud continuum. Emphasizing the significance of location awareness, the authors propose a comprehensive framework that encompasses architecture, data models, and placement algorithms. These elements are specifically designed for the provisioning and dynamic updating of services within the ADRENALINE Testbed. The paper takes a practical approach by leveraging the ETSI TeraFlowSDN controller to implement and manage these services. The ADRENALINE Testbed serves as a real-world testing ground, providing valuable insights into the feasibility and efficiency of the proposed solutions. Furthermore, the work outlined in the paper is situated within the broader context of research activities under WP5.
C3	This paper considers the problem of distributed lossy compression where the goal is to recover one or more linear combinations of the sources at the decoder, subject to distortion constraints. For certain configurations, it is known that codes with algebraic structure can outperform i.i.d. codebooks. For the special case of finite-alphabet sources, recent work has demonstrated how to incorporate joint typicality decoding alongside linear encoding and binning. This work takes a discretization approach to extend this rate region to include both integer- and real-valued sources. As a case study, the rate region is evaluated for the Gaussian case. The resulting joint-typicality-based rate region recovers and generalizes the best-known rate region for this scenario, based on lattice encoding and sequential decoding. This work is part of WP3 research activities.
C4	Network slicing has emerged as a revolutionary solution to fifth generation (5G) network design and operation. However, the inherent mobility of the end users introduces important new and unexplored challenges with regard to the network slice continuity across different administrative domains (i.e., networks controlled by different operators). In this paper, we introduce Network Slice Federation as a Service (NSFaaS), a novel cloud-native orchestration framework for network slice federation that incorporates well-defined interfaces to exchange federated service and slice resource templates among operators. The proposed framework is fully compliant with existing standards on network slicing and operator federations. In addition, we have designed and deployed a cloud-native federated 5G experimental platform to demonstrate the feasibility of the proposed framework and assess its performance in terms of “post-federation” slice creation. This work is part of WP3 research activities.

In order to raise awareness within the consortium about dissemination opportunities in relevant journals and conferences, an Excel file containing a list of upcoming special issues has been created and uploaded to the TEAMS repository. It will be periodically updated.

2.3 Events

2.3.1 EuCNC´23

Miquel Payaró (CTTC), PI of SUCCESS-6G project, participated as invited speaker at the EuCNC'23 workshop "The Role of AI in Edge 6G topologies" (more info can be found in the following link: https://www.eucnc.eu/programme/workshops/workshop-2/). The goal of this workshop was to discuss the close synergy between Artificial Intelligence (AI) and edge computing, as two key enabling

technologies shaping 6G, and identify the roadmap for more holistic, sustainable, and future-proof design of AI- and edge-enabled solutions. Miquel (Figure 1) provided the talk "*Experimental validation of edge-hosted AI/ML approaches in B5G/6G networks*" where, among other activities, he presented a summary of the SUCCESS-6G project, highlighting the relevance of edge computing in the two vehicular use cases developed in the project.

Figure 1 CTTC presence at EuCNC 2023

2.3.2 Mobile World Congress 2023

The GSMA Mobile World Congress is the world's largest exhibition for the mobile industry, incorporating a thought-leadership conference that features prominent executives representing mobile operators, device manufacturers, technology providers, vendors, and content owners from across the world. SUCCESS-6G was presented by Nearby Computing during the Mobile World Congress in Barcelona (Figure 2). Mobile World Congress 2018 attracted more than 88.000 attendees from more than 200 countries. More than 50% of the attendees were from sectors adjacent to the mobile ecosystem, something that boosted the interest attraction in the NBC stand. More specifically, more than 2.000 people visited our booth, expressing interest either from a technical point of view or a management perspective to get ideas on the impact that SUCCESS-6G solutions could have in their companies/projects.

Figure 2 SUCCESS-6G presented by NBC in MWC 2023

2.4 Liaisons with 6G-IA/SNS JU and other initiatives

This section includes other research projects and initiatives that SUCCESS-6G partners participate and provides a connection between these activities and the SUCCESS-6G project.

2.4.1 5GMED

The 5GMED project, with a global investment of 16 Mio euros of which 75% is financed by the European Commission, aims to bring a sustainable 5G deployment model for future mobility in the Mediterranean Cross-Border Corridor.

Through 4 pilot tests in railway and highway between Figueres and Perpignan 5GMed will demonstrate advanced cross-border trials of 5G application scenarios in Cooperative Connected and Automated Mobility (CCAM) and Future Railway Mobile Communications System services (FRMCS).

The services to be tested will rely on a broad range of technologies beyond 5G, including on-board sensors and Artificial Intelligence (AI), providing advanced connectivity services in a scalable and replicable manner across transport paths.

The infrastructure will support a remote driving use case, advanced traffic management, applications and business service continuity in railway, and follow-me infotainment both in highway and railway scenarios.

The use case demonstrations will be carried out in three small scale testing facilities in order to replicate real conditions, based on the outcomes of the tests, a final integration and validation will be carried out in the cross-border section between Figueres and Perpignan. A strategic section in the Trans-European Transport Network since it sustains 55% of the road traffic between the Iberian Peninsula and the rest of Europe and 65% of the rail traffic.

Relevance to SUCCESS-6G: Network and service orchestration are key concepts in the 5GMED project. In addition, the small-scale tests have been conducted in the Castelloli circuit, an environment that will be leveraged in the SUCCESS-6G project.

2.4.2 CRETA

CRETA is a project selected by the UNICO-5G Sectorial program that will demonstrate the synergy of three different technologies: 5G (communications sector), remote measurement technology for traffic emissions (transport-mobility sector), and advanced analytics and artificial intelligence (digitization sector), for the optimal management of traffic mobility in three strategic areas (Barcelona, Madrid, and País Vasco) through three demonstrations:

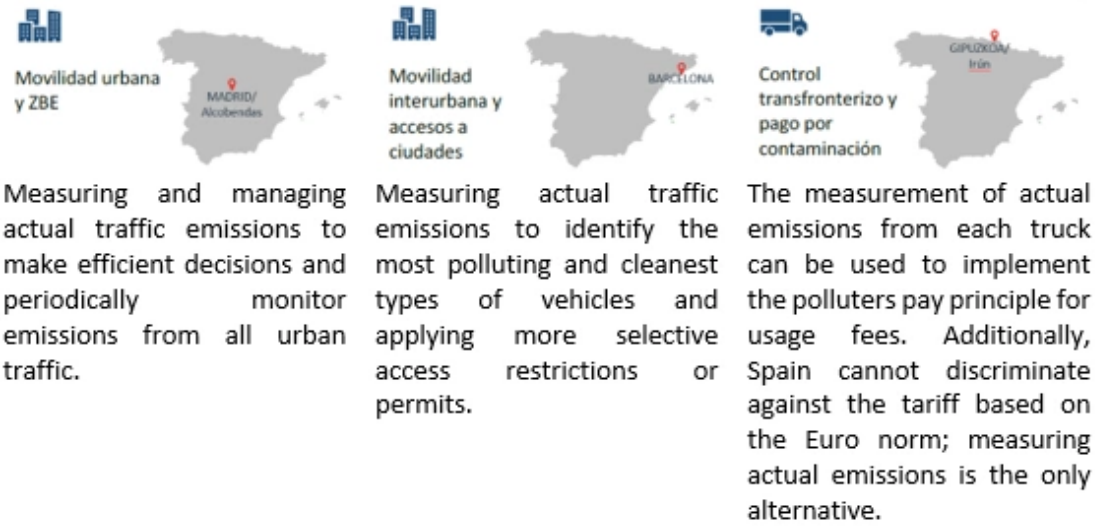

Figure 3 Demonstrations in CRETA project

The project is led by a major telecommunications company, Grupo Masmóvil (MSM), with significant participation from its subsidiary, Euskaltel. The rest of the consortium consists of 3 large companies (Indra, Abertis Autopistas, and Cellnex) and 4 SMEs (Opus RSE, Abertis Mobility, Syltec, and Vinces Consulting)

Challenges: Validating the synergy between 5G and C-V2X and testing use cases for providing advanced traffic services.

Solution: A scalable 5G and C-V2X architecture enabled for AI, supporting mobility services focused on pollution reduction; designing a dynamic tariff system based on the detection of individual vehicle emissions levels.

Relevance to SUCCESS-6G: In the CRETA project, innovative use cases based on V2V, V2I, V2X communications are involved, which use both modes of C-V2X: PC5 and cellular Uu (5G). This pilot makes the learning and experience obtained can be replicated in similar projects such as SUCCESS-6G.

2.4.3 CLOUDSKIN

CloudSkin aims to design a cognitive cloud continuum platform to fully exploit the available Cloud-edge heterogeneous resources, finding the “sweet spot” between the cloud and the edge, and smartly adapting to changes in application behavior via AI. To facilitate automatic deployment, mobility and security of services, CloudSkin will build an innovative universal container-like execution abstraction based on WebAssembly that allows the seamless and trustworthy execution of (legacy) applications across the Cloud-edge continuum.

The goals of CloudSkin are the following:

- Smart management for the Cloud-edge continuum: The overall objective is to leverage the generated knowledge from state-of-art AI methods to transparently orchestrate Cloud-edge resources. The key goal is to build a “Learning Plane” that, in cooperation with the application execution framework and continuum infrastructure, can enhance the overall orchestration of Cloud-edge resources. Such plane is the materialization of the cognitive cloud, where decisions on the cloud and the edge are driven by the continuously obtained knowledge and awareness of the computing environment through AI, and particularly, neural networks and statistical learning, taking the challenge of enabling these methods into low-power edge devices.
- Virtual execution for the Cloud-edge continuum: This goal focuses on a new universal and flexible execution abstraction, we called it “Cloud-edge cells”, that will enable the execution of legacy and highly granular applications in the cloud continuum. The new container-like execution abstraction will be based on the WebAssembly technology. It will enable the execution of the same computation on a wide range of cloud and embedded devices and make task execution migratable across different servers and devices in the continuum infrastructure. We will integrate our WebAssembly executor with Kubernetes. More specifically, we will contribute new features to Kubernetes that will support the efficient migration of WebAssembly containers between different levels of the continuum, exploiting WebAssembly’s capability for state serialization.
- Infrastructure support for the Cloud-edge continuum: This objective is to prepare the infrastructure to turn it into a virtual resource continuum, where the large set of Cloud-edge cells composing applications can be allocated flexible resources, according to their dynamically changing needs. One of the major challenges here is to design an infrastructure to support extremely short-lived Cloud-edge cells and tasks (of 1 to 10ms, or less) and extremely intense bursts with fast data access requirements. This requires delivering bare metal resource performance to storage, despite virtualization and dynamic reallocation, which today is not possible in the cloud continuum. CLOUDSKIN will achieve this by leveraging high-performance I/O (RDMA networking) and near-storage CPU compute capacity (GPUs, FPGAs) to the fine-grained application tasks.

Relevance to SUCCESS-6G: Orchestration of automotive-related applications is one of the main use cases in Cloudskin. The Castelloli environment (provided by Cellnex) and the NearbyOne orchestrator (provided by Nearby Computing) are key elements in this use case and the developments in Cloudskin are expected to be leveraged in SUCCESS-6G.

2.4.4 PODIUM

PoDIUM will address realistic needs of advanced CCAM (Connected, Cooperative and Automated Mobility) services with the goal of shaping the Physical Digital Infrastructure (PDI) landscape by relying on 5G connectivity. The CCAM initiative is designed to support EU countries and the European automotive industry in their transition to connected and automated driving, while ensuring the best mobility environment for the public. CCAM focuses on moving people and goods along our road networks in a safe, quick, cost-effective, comfortable, and environmentally friendly manner using automated vehicles, leveraging Mobility-as-a-Service (MaaS) platforms.

The PoDIUM consortium will use and enhance three key European facilities called Living Labs (LL) in the following countries:

- Germany – city of Ulm
- Italy – city of Turin and highway tunnel (A22/Brenner cross-border)
- Spain – city of Barcelona and Spain-France cross-border highway

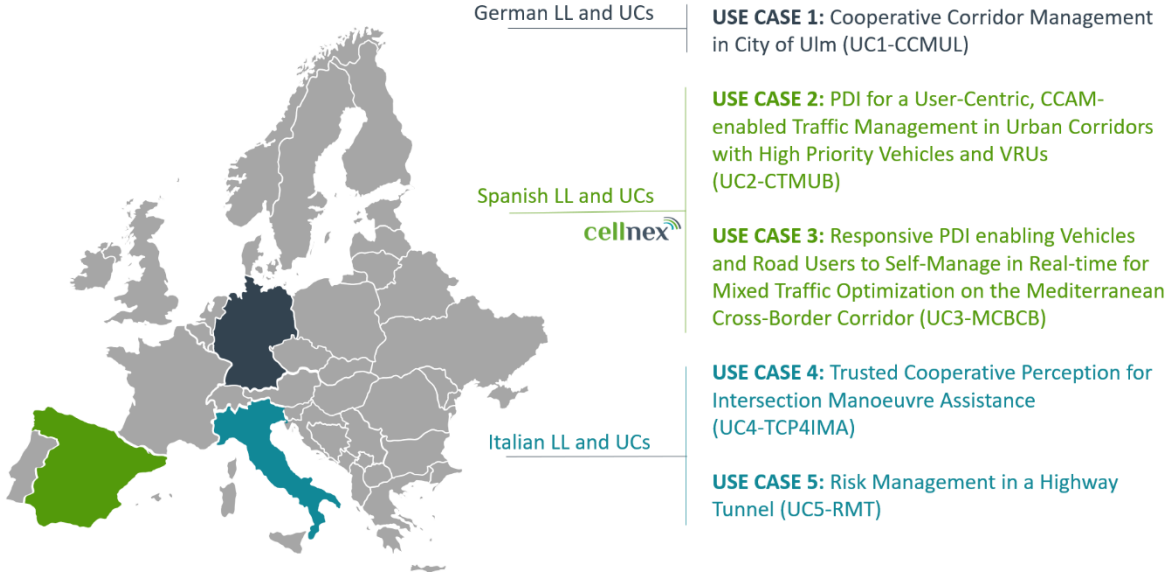

Figure 4 PODIUM use cases

Relevance to SUCCESS-6G: The Spanish LL, which supports use cases based on 5G and Mobility (e.g., Traffic Optimization), serves as a mirror-guide for the development of use cases and infrastructure in Castelloli environment.

2.4.5 ECOMOBILITY

EcoMobility will support European industry and cities in transitioning from isolated and static transportation means towards a service centric, connected mobility ecosystem by sharing data and services across involved stakeholders. The project will enable and simplify cooperative development, deployment, operation, and life cycle management of connected adaptive end-to-end mobility solutions in a sustainable manner.

EcoMobility will establish devops practices within the supply chain with continuous and customized cloud-based addition and improvement of mobility services support contract-based runtime coupling of mobility services within edge/cloud-based service for deployment of AI solutions, coupled with monitoring, analysis and coordination of vehicles, transportation infrastructures and people deliver reliable & enhanced vision, perception, including HD maps, and localization systems for safe, connected, and automated vehicles deliver customized and improved fail-operational ADAS systems reflecting technology capabilities of heterogeneous vehicles and protecting vulnerable road users provide energy-aware control and scheduling of electric vehicles including smart Battery Management Systems (BMS) and coordination with other transportation means contribute to increased public acceptance of electrified autonomous vehicles and bridge gaps between technological advancements and legal and regulatory frameworks.

The demonstrators within EcoMobility will showcase the project's findings and capabilities for the end-to-end sustainable mobility ecosystem with impact on improved trust, safety, security, efficiency, and ecology of mobility solutions to a level appropriate for mass-market deployment. Emerging innovations will leverage the expertise of world-renowned industrial and research partners within the mobility value chain, giving Europe a competitive edge in a growing market with direct contributions to the European goal of zero road fatalities by 2050.

Relevance to SUCCESS-6G: ECOMOBILITY developed OBU will be used, with some adaptations, in SUCCESS-6G. This OBUs is the basic piece to provide real vehicle data needed for SUCCESS-6G use cases.

2.4.6 VERGE

VERGE is a research and innovation project under the European Smart Networks and Services Joint Undertaking (SNS JU), a Public-Private Partnership that aims to facilitate and develop industrial leadership in Europe in 5G and 6G networks and services. The main goal of VERGE is to provide an integrated approach on how to tackle the challenges of edge computing evolution, described around three main pillars:

1. "Edge for AI", namely a flexible, modular, and converged edge platform design, unifying the lifecycle management and closed-loop automation for cloud-native applications, Multi-access Edge Computing (MEC) and network services across the edge-cloud compute continuum for ultra-high computational performance.
2. "AI for Edge", namely an AI-powered portfolio of solutions leveraging the multitude of collected metrics for intelligent management and orchestration.
3. "Security, privacy and trustworthiness of AI-based models at the edge", providing a suite of methods to protect AI models against adversarial attacks, increase their explainability and reliability, and ensure data privacy.

Relevance to SUCCESS-6G: VERGE is designing a cloud-native edge platform that is expected to be adopted in SUCCESS-6G. This cloud-native nature will enable the automated orchestration of selected SUCCESS-6G use cases.

2.5 Logo and visual identity

At the start of the project, the consortium has created a logo to make all visual communication and dissemination easily recognizable. The consistent use of the SUCCESS-6G project logo (Figure 5) will be the major factor contributing to the project's visual identity. The logo is available in the Teams repository of SUCCESS-6G for anyone in the project to use. It is also consistently embedded in templates for deliverables, presentation slides, and more.

Figure 5 SUCCESS-6G logo

Additionally, the UNICO-5G logo is included in all the SUCCESS-6G communication channels, deliverables, presentation slides, leaflets, posters, etc., as an identifier that easily allows the target audience to relate SUCCESS-6G to the specific call (Figure 6).

Figure 6 UNICO logo

2.6 Website

The project website https://success-6g-project.cttc.es/ was launched at the start of the project and it is the principal mean for disseminating and communicating the activities of the project. It compiles information pertaining to SUCCESS-6G public deliverables, as well as information related to dissemination activities and results. As shown in Figure 7, the project website provides dedicated pages for the reporting of scientific publications with acknowledgement to SUCCESS-6G project, and for news items which are relevant to outreach activities and promote the digital visibility of the project. The website will be regularly updated over the lifetime of the project. Finally, we plan to use Google Analytics to monitor and measure relevant metrics (e.g., number of users, session, page views, and average session duration) that indicate the traffic of the website to understand if the content provided is well received by visitors.

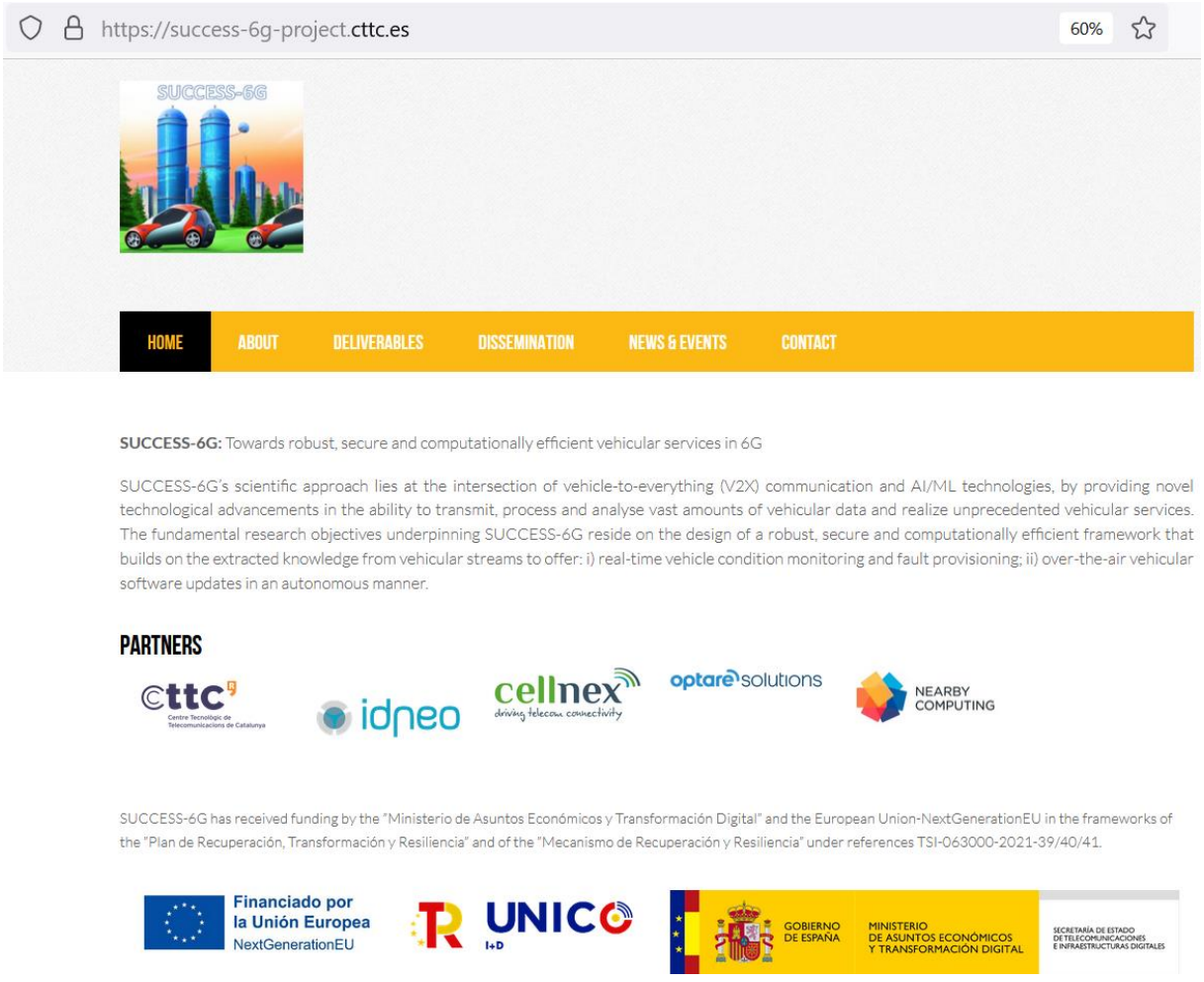

Figure 7 SUCCESS-6G project website

3 Standardisation plan

3.1 Standards-related strategy

The standardization activities carried out in SUCCESS-6G are based on the following principles:

- Focus on the most relevant target organizations, bodies, and professional societies where SUCCESS-6G could contribute with project's key innovations.
- Constantly evaluate the applicable standardization bodies to identify new opportunities, reconsider, and pivot efforts towards those most suitable to increase the impact of SUCCESS-6G results.
- Update and promote the tracking file in TEAMS, to assess progress, coordinate activity, raise awareness of new standardization opportunities, and increase commitment and participation among consortium partners.
- Combine the impact of standardization with the participation of partners in open-source software communities. Besides, create a parallel "fast track" in the standardization processes through "de facto" adoption through these open-source projects with high impact, some of them promoted by the standardization organizations themselves.

In particular, as an automotive component manufacturer, Idneo must adhere to specific standards within the automotive sector. These standards are nearly mandatory for any product embedded within a vehicle. The capabilities regarding the services provided by Idneo are as follows:

- Functional safety. ISO 26262 Road vehicles
- SW development. AUTOSAR 4.x, SPICE level 3, Cybersecurity ISO/SAE 21434
- HW development. AEC-Q200 grade in components, Cybersecurity ISO/SAE 21434
- Testing and compliance. EN ISO/IEC 17025 accredited testing laboratories by ENAC

3.2 Targeted standardisation bodies and standards-related organisations

3.2.1 6G-IA

Website: 6g-ia.eu

The 6G Smart Networks and Services Industry Association (6G-IA) is the voice of European Industry and Research for next generation networks and services. Its primary objective is to contribute to Europe's leadership on 5G, 5G evolution and SNS/6G research.

The 6G-IA represents the private side in both the 5G Public Private Partnership (5G-PPP) and the Smart Networks and Services Joint Undertaking (SNS JU). In the 5G-PPP and SNS JU, the European Commission represents the public side.

The 6G-IA brings together a global industry community of telecoms & digital actors, such as operators, manufacturers, research institutes, universities, verticals, SMEs and ICT associations.

The 6G-IA carries out a wide range of activities in strategic areas including standardization, frequency spectrum, R&D projects, technology skills, collaboration with key vertical industry sectors, notably for the development of trials, and international cooperation.

3.2.2 EIT Urban Mobility

Website: www.eiturbanmobility.eu

EIT Urban Mobility is an initiative of the European Institute of Innovation and Technology (EIT). Since January 2019 we have been working to encourage positive changes in the way people move around cities in order to make them more liveable places. We aim to become the largest European initiative transforming urban mobility. Co-funding of up to € 400 million (2020-2026) from the EIT, a body of the European Union, will help make this happen.

3.2.3 3GPP

Website: www.3gpp.org

The 3rd Generation Partnership Project (3GPP) unites seven telecommunications standard development organizations (ARIB, ATIS, CCSA, ETSI, TSDSI, TTA, TTC), known as "Organizational Partners" providing their members with a stable environment to produce the Reports and Specifications that define 3GPP technologies.

3GPP specifications cover cellular telecommunications technologies, including radio access, core network and service capabilities, which provide a complete system description for mobile telecommunications. The 3GPP specifications also provide hooks for non-radio access to the core network, and for interworking with non-3GPP networks.

The 5G and LTE-Advanced ecosystem will allow for global network evolution, at the appropriate pace for the market need and the local state of readiness. The 3GPP model is one that maximises on its compatibility with legacy 3GPP infrastructure and equipment, delivering the promise of a ubiquitous end-to-end ecosystem that can support a growing number of use cases.

3.2.4 Car2Car

Website: www.car-2-car.org

The CAR 2 CAR Communication Consortium (C2C-CC) aims at assisting towards accident-free traffic (vision zero) at the earliest possible date. It further aims at supporting the highest safety level at improved traffic efficiency anywhere, anytime at the lowest cost to the end user and the environment. While working on solutions supporting all driving levels from manual to fully automated it considers specific needs of stakeholders, types of vehicles and users. The C2C-CC contributes to the development and specification of robust and reliable solutions that allow for a continuous and seamless evolution of required functionalities. It enables technologies driven by innovation and competition, thereby fostering concepts of cooperation between the road users and with the road infrastructure. This is based on sharing information, awareness, perception, and intentions while focusing on tactical level and considering strategic and planning level as required.

3.2.5 CCAM

Website: www.ccam.eu

Stablished in 2021, the international not-for-profit organisation CCAM Association represents the private side of the CCAM Partnership, regrouping more than 180 innovation stakeholders involved in the connected, cooperative, and automated mobility field. CCAM brings all the relevant stakeholders from divers sectors such as industry, research, services, public and local authorities, associations, SMEs, the CCAM Association aims to accelerate the development of new technologies and their deployment in real life with all that implicate.

4 Exploitation plan

4.1 Cellnex

Cellnex deploy, facilitate, and manage the CELLNEX Mobility Lab, located at the Circuit Parcmotor Castellolí near Barcelona (Spain), is a pioneering and innovative test space for the development of ITS technological solutions associated with 5G, sustainable mobility and autonomous vehicles. The circuit has been equipped with, 5G and Edge Computing technologies and a private wireless network with coverage throughout the venue. Thanks to SUCCESS-6G project and use cases, Cellnex will be able to update the technology and facilities in the CELLNEX Mobility Lab and test the different use cases to be able to replicate them in another future opportunities or new use cases.

4.2 Idneo

Idneo develop, validate and manufacture a comprehensive range of Telematic Control Units, from ultra-compact, low cost for small mobility products, to high-end 5G connectivity units with a complete set of hardware and software features for automotive costumers, as well as On-board services in out TCUs, like eCall, location remote OBU programming and vehicle diagnostics and control. With the development of SUCCESS-6G we will be able to implement many features within our VMAX platform that were previously undeveloped. For instance, this includes establishing communication with the vehicle's CAN bus and deploying a specific 5G SA modem variant for North America, incorporating C-V2X capabilities. This will help us expand the scope of demonstrators to include other clients outside of Europe.

4.3 Optare Solutions

Optare Solutions has been working for over 5 years on projects related to the field of digital service infrastructures, specifically focusing on 5G Edge Computing and Artificial Intelligence technologies. Throughout this time, the 5G proposal has matured, acting as a catalyst for other technologies. The combination of these technologies facilitates the creation of architectures that serve as enablers for different digital services.

Use cases present on this project involve a combination of communication and computing optimizations to create solutions that address challenges associated with V2X security. Optare Solutions will exploit the achievements obtained in the development of this project to ensure software loads securely as it is vital to prevent inappropriate behaviors, and to validate that the received information from the car sensors is appropriate and free from erroneous information.

It is important to consider that in the near future, autonomous and connected vehicles will be a reality and susceptible to malicious programming. This could pose a serious problem due to the large number of vehicles in the automotive fleet.

4.4 NBC

NBC is active in the area of end-to-end (E2E) network and service orchestration, focusing on the challenges at the Edge. NBC will provide their NearbyOne platform, which carries intra- and inter-domain orchestration capabilities and addresses the problem of NFV and application orchestration in the cloud continuum. NBC will exploit the achievements of the project to improve their flagship product in a multifaceted manner: i) the AI models developed in the project are expected to enhance the orchestration capabilities and place NearbyOne in an advantageous position in the market of zero-

touch service and network management; 2) The project-specific use cases will open new directions and foster new collaborations and partnerships with vertical stakeholders (e.g., automotive); and 3) the upgrade of the product is expected to facilitate the participation of the company in future research projects on Cloud-Edge/6G networks, where zero-touch principles will be inherent by design. To that end, progress and results of this project will be shared with the development team and discussed with interested stakeholders and potential customers in innovation venues.

4.5 CTTC

The exploitation plan of CTTC is threefold since the project coordination of SUCCESS-6G and the active participation in its research activities will i) generate knowledge and expertise in the intersection of AI/ML and V2X communication areas, strengthening the national and international reputation of CTTC as a key reference institution within the field of data-driven V2X connectivity; ii) strengthen the visibility of CTTC as a key player in devising robust, resilient, and sustainable solutions for AI/ML-based vehicular systems, thus facilitating further collaboration in future research programs involving relevant challenges; and iii) strengthen the collaboration with leading National and European industry players, thus maximizing the technology transfer generated by CTTC. One of the main objectives of CTTC is to build bridges between academia and industry, promoting a new economy based on knowledge and technology. The participation of CTTC in SUCCESS-6G, acting as project coordinator, will establish connections with big industrial players in Spain and Europe, within the V2X and edge computing areas as well as in other sectors with similar research objectives.

5 Conclusion and Outlook

This deliverable (E15) has reported the dissemination, communication, and exploitation activities during the first year of the coordinated SUCCESS-6G project for the three subprojects: EXTEND, DEVISE, and VERIFY. In this interim report, we have listed i) communication and dissemination activities, in terms of popular events, liaisons with other 6G-IA initiatives, scientific publications, etc.; ii) a standardization plan with targeted standardization bodies; and iii) an exploitation plan that includes the exploitation vision of the SUCCESS-6G partners. The dissemination, communication and exploitation activities will continue in the context of SUCCESS-6G and any relevant activities will be reported in the final deliverable of this series (i.e., E16).