Grant Agreement Number: 768953

Project acronym: ICT4CART

Project full title: ICT Infrastructure for Connected and Automated

Road Transport

D 9.7 Final report on communication, dissemination & liaison

Due delivery date: 28 February 2022

Actual delivery date: 22 February 2022

Deliverable type: R

Organization name of lead participant for this deliverable: ERTICO

Dissemination level		
PU	Public	X
PP	Restricted to other programme participants (including the GSA)	
RE	Restricted to a group specified by the consortium (including the GSA)	
CO	Confidential, only for members of the consortium (including the GSA)	

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 768953

Document Control Sheet

Deliverable number:	9.7
Deliverable responsible:	ERTICO
Work package:	9
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Document Revision History			
Version	**Date**	**Modifications Introduced**	
		Modification Reason	**Modified by**
v 0.1	03/01/2022	First draft for collecting WP9 partners input	Elisa Todesco (ERTICO)
v 0.2	01/02/2022	Draft for internal review	Elisa Todesco (ERTICO)
v 0.3	10/02/2022	Reviewed by ICCS	Irini Krimpa (ICCS)
v 0.4	21/02/2022	Updates and corrections	Lidia Buenavida (ERTICO)
v 1.0	22/02/2022	Final version	Lidia Buenavida (ERTICO)

Abstract
The Final Report on Communication, Dissemination & Liaison provides the final updates of all the communication, dissemination and liaison activities that have been performed during the three years of implementation of ICT4CART. The document describes broad communication and dissemination actions carried out by the project consortium to promote the project and its scientific achievements, as well as to disseminate relevant results among key target audiences as well as among the general public. This report also highlights the main achievements and the performances of the communications, dissemination and liaison activities carried out by the consortium.

Legal Disclaimer

Abbreviations and Acronyms

Acronym	Definition
AB	Advisory Board
Cfr.	Confront
DX.Y	Deliverable number Y of the Work Package number
EC	European Commission
ETSI	European Telecommunications Standards Institute
EU	European Union
GA	Grant Agreement
ICT	Information and Communication Technology
ICT4CART	Infrastructure for Connected and Automated Road Transport
ISG	Industry Specification Group
IT	Information Technology
ITS	Intelligent Transportation System
KPI	Key Performance Indicator
L4	Level Four
MEC	Multi-access Edge Computing
MX	Month number X of the project course – (month in which a specific action takes place)
Q4	Fourth Quarter
R&D	Research and Development
TC	Technical Committee
WP	Work Package

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Executive Summary

Context

Connected and automated vehicles are a key focal point of ITS research. To enable and accelerate their deployment in our everyday life, ICT is a prerequisite; this is the frame in which ICT4CART project places itself.

Despite the significant advances in the telecom and IT industries, several ICT challenges related to connectivity, data management, cyber-security and ICT infrastructure architectures still exist, and need to be addressed to enable road vehicle automation.

ICT4CART aimed to address the gaps to deployment, bringing together over 42 months key players from the automotive, telecom and IT industries to shape the ICT landscape for Connected and Automated Road Transport and to boost EU competitiveness and innovation in this area.

Project scope

ICT4CART's main objective was to design, implement and test in real-life conditions a versatile ICT infrastructure that will enable the transition towards higher levels of automation (up to L4) by addressing existing gaps and working with specific key ICT elements, namely hybrid connectivity, data management, cyber-security, data privacy and accurate localisation.

ICT4CART built on high-value use cases (urban and highway), which have been demonstrated and validated in real-life conditions at ICT4CART test sites in Austria, Germany and Italy (cfr.D7.3, D7.4, D7.5). Significant effort has been put into cross-border interoperability through the set-up of a separate test site at the Italian-Austrian border (cfr. D7.6).

D9.7 Final report on communication, dissemination & liaison

This document provides ICT4CART's final report on communication, dissemination & liaison activities carried out by the whole consortium throughout the entirety of the project. It includes a detailed overview on all communication and dissemination actions that have been performed by the ICT4CART consortium from M1 until M42 (timeline moved from M36 to M42 due to the official extension obtained by the project), benchmarking the performances and the achievements of ICT4CART's communication, dissemination and liaison's efforts against the KPIs set in D9.1 (M6).

1 Introduction

The current deliverable, named *D9.7 Final report on communication, dissemination & liaison*, is the final reporting document for all the communication, dissemination and liaison activities carried out within WP9 of ICT4CART project during its implementation according to the Communication Strategy and Plan detailed in D9.1 (submitted in M6), D9.2 (submitted in M18) and D9.3 (submitted M36).

The whole consortium has carried out communication and dissemination activities as a joint effort, under the guidance of the WP Leader (ERTICO) and the Tasks Leader. The Dissemination and Communication activities achieved have also been adapted and enlarged as needed, with the agreement of each Task Leader and prior informing ICT4CART consortium. The current document also analyses the results achieved by the consortium after the implementation of the corrective measures introduced to tackle the disruption brought by the Ccovid-19 pandemic. Finally, it reports on the ICT4CART final events held in October and November 2021.

1.1 Purpose of the document

This document reports on the final results of the ICT4CART communication, dissemination and liaison activities and the implementation of the up-to-date ICT4CART Communication Strategy and Plan.

1.2 Intended readership

D9.7 is a public deliverable addressed to any interested reader. The deliverable summarises the activities carried out since the official start of the project and offers an exhaustive overview of the results achieved by the consortium in pursuing the promotion and diffusion of the project and its results.

2 ICT4CART Communication Strategy & Plan

Communication and dissemination of project activities are paramount actions to ensure the effectiveness and sustainability of products, results and outputs, within and beyond the project's lifetime.

A well-structured communication strategy is an effective instrument to maximise the impact of project results and outcomes, optimise their value and allow their active and concrete use in systems and practices at local, regional, national and European level. As ICT4CART developments are relevant not only for scientific and technical communities, but also for three different industries (automotive, telecom, IT), as well as for non-technical audiences and general public, ICT4CART partners have been being highly committed to performing dedicated communication activities, to convey the project messages and results to all related stakeholders.

For these purposes, a consistent communication and dissemination strategy has been developed early on in the project (D9.1 submitted at M6) and updated on a regular basis (D9.2 and D9.3) within the framework of ICt4CART WP9 "Communication, Dissemination and Exploitation".

The ICT4CART communication and dissemination strategy developed by the consortium was the key pillar that described all the procedures to be followed by ICT4CART consortium partners to promote the project and its results efficiently to the different target audiences, as well as identified relevant KPIs and framework references for the results achieved by WP9.

Specifically, the Plan has defined both strategic approach and operational procedures adopted by the consortium to promote the project and disseminate its objectives and main results as widely as possible. It also identified key messages and specific target audiences, specific tools and channels to be leveraged throughout the 42 months of ICT4CART, and corrective measures implemented by the consortium to achieve the best results possible despite the challenges posed by the covid-19 pandemic (this last topic and specific corrective measures are outlined in D9.3).

The identified ICT4CART key messages include, but are not limited to the following:

- Raising awareness of the potential benefits of ICT4CART proposed technology;
- Engaging with target audiences to collect feedback for further development;
- Dissemination of project results;
- Engaging with relevant R&D projects, associations/networks, standardisation bodies and organisations to ensure knowledge exchange, interoperability and wide market penetration;
- Engaging new and final users to contribute with inputs and feedback throughout the implementation of the project;
- Demonstrating how ICT4CART solutions are relevant for the daily life of European citizens;

- Promoting the EC's work and its support towards Research & Innovation actions in the field of Smart Mobility and Connected and Automated Driving.

Such messages have been addressed to each of the selected target groups (research community, policy makers, industrial players, IT, telecom, automotive industries, road operators, service providers and other end-user communities, innovative SMEs, standardisation bodies, non-technical and general audience) and tailored as demanded by the specific opportunity to ensure a significant impact of the diffused information and engage the audience according to their interests and needs.

For a more detailed overview on ICT4CART communication and dissemination plan cfr. D9.1, D9.2 and D9.3.

3 Key Performance Indicators and other monitoring tools

3.1 ICT4CART's KPIs

D9.1 set a series of KPIs as measurable targets for dissemination activities to ensure that the desired impact is achieved. Nevertheless, the fulfilment of certain KPIs set for ICT4CART's communication and dissemination activities has been offset by COVID-19 global pandemic. In particular, the disruption of the events sector and the cancellation of key conferences and international events targeted by the consortium have resulted in a significant setback in achieving the planned results. Nevertheless, the consortium came up with alternatives, such as webinars, in order to keep communicating and disseminating. Thanks to the commitment of the partners and the 6 months' extension granted to the project, the partners of the consortium have not only been able to finalise the planned research and demonstration activities, but also to communicate the key results from the projects to relevant targeted stakeholders, organise promotional events and produce additional communication material (e.g. two technical newsletters, a final video, a new social media campaign, press releases, etc.) in order to guarantee the best and broadest dissemination of results possible.

The consortium's communication and dissemination efforts over the project's whole duration, coupled with the extra activities and the mitigation measures introduced in 2021/2022, have contributed to the achievements of most of the KPIs set for the project. As shown in Figure 1 (below), most of the KPIs proposed by the consortium have been achieved, with only a minor percentage of KPIs only partially achieved. Given the heavy toll that the Covid-19 pandemic has requested from communication, dissemination and networking activities, the results have been good.

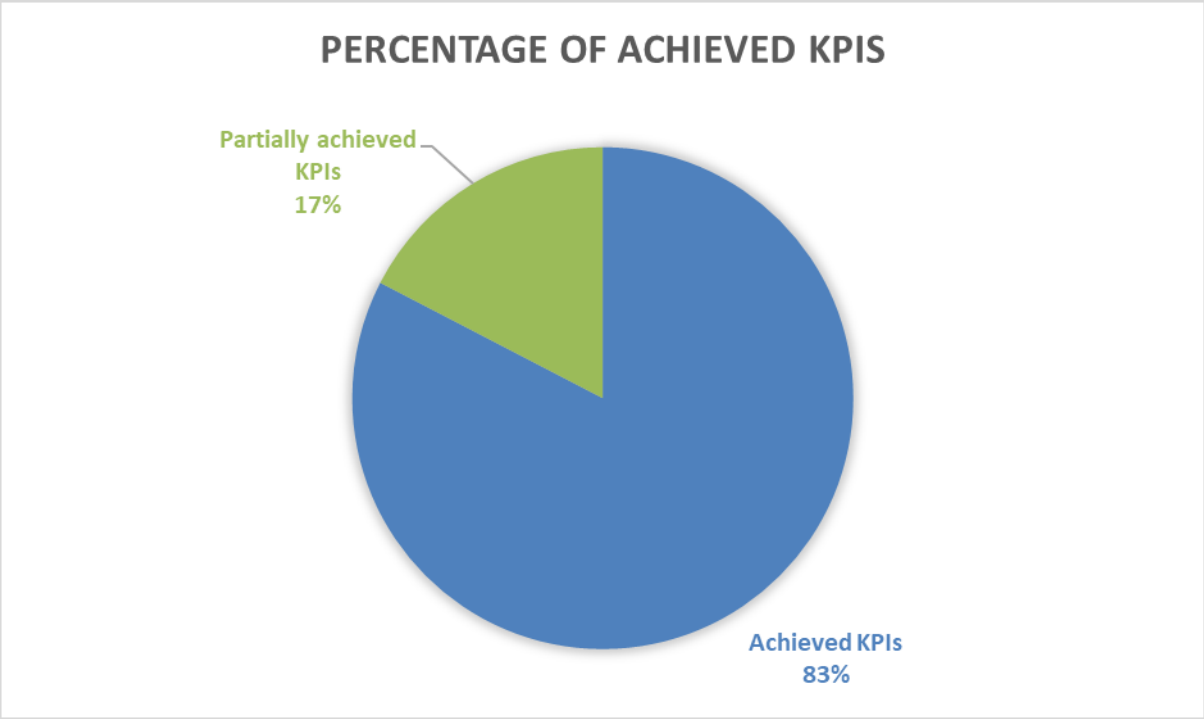


Figure 1: Percentage of achieved KPIs

Table 1 (below) describes the planned ICT4CART's Communication and Dissemination activities performed in the different project phases, the expected KPIs and results, the corrective measures (when needed) and the final results achieved at the end of the project.

Table 1: ICT4CART dissemination and communication KPIs and perforance against KPIs

Activity	Description	KPI	Expected result	Mitigation measure	Result achieved
Brand identity – ERTICO	A coherent and consistent brand identity has been created to ensure ICT4CART visual products are effective and recognisable, explaining the project meaning and core idea clearly.	Logo, procedures and guidelines, Word template, PPT template, visuals that are connected with the brand that is used on ICT4CART website and flyer.	Creation of strong and recognisable logo and branding to be used on all official ICT4CART documents and assets, at events and fairs, and in all external-facing occasions.	n.a.	ICT4CART's brand identity has been successfully developed in M6 (cfr. D9.4 Brand Identity and Guidelines). **Status: achieved**
Project website - ERTICO	Launch, maintenance and update of ICT4CART website as a hub of relevant information, news and events related to the project.	Public website with specific sections for the different topics and products.	100 unique visitors per month.	n.a.	Between its launch (M6) and August 2021 (M42), the website registered 6809 new users, that means it had on average 189 unique users per month. The website recorded 10220 sessions and 24430 page views during the same time-span. **Status: achieved**
Communication kit - ERTICO	Production of a communication kit to facilitate the information flow and promotion of the project.	Flagship flyer, ICT4CART newsletter; short videos (starting from M18), roll-up banners, 1 professional video.	A wider understanding of the objectives and aims of the project by stakeholders.	**Mitigation measure**: production of two technical newsletters between M37-M42; Production of videos of the demo sites.	All communication tools have been developed (cfr. D9.5 Communication Tools VI, submitted in M6); four newsletters (two normal, two technical) have been distributed,; the first animated video has been produced in M18[1] . Videos showcasing the demo activities, as well as a closing longer video featuring an interview with several

[1] https://www.youtube.com/watch?v=GtUEdaSr0V8

					partners have been developed. **Status: achieved**
Social media channels - ICCS	Social media will spread project-related news, raise awareness about the core topics and achievements, promote ICT4CART events, and disseminate public results (deliverables, articles, etc.)	LinkedIn project group; ICT4CART twitter account. Project channels will be regularly updated (weekly base); partners will contribute sharing the content on their own corporate accounts.	Timeline: whole duration of the project		
			At least 500 followers for Twitter;	**Mitigation measure**: Communicating the latest project results through project's social media pipelines and promoting them during upcoming conferences and events (e.g. ICT4CART final conference, ITS world 2021 etc).	A project twitter account has been created, as it is underlined in task 9.1 description 'Development of the ICT4CART website and social media accounts'. We also sustain ERTICO's account to boost outreach. ICT4CART Twitter account counts 355 followers. **Status: partially achieved**
			At least 150 members for LinkedIn;	**Mitigation measure**: Communicating the latest project results through project's social media pipelines and promoting them during upcoming conferences and events (e.g. ICT4CART final conference, ITS world 2021 etc).	ICT4CART LinkedIn group counts 155 members (15/02/2022) and 51 started discussions. **Status: achieved**
			At least 10 posts shared per partner in individual social accounts;	**Mitigation measure**: Communicating the latest project results through project's social media pipelines and promoting them during upcoming conferences and events (e.g. ICT4CART final conference, ITS world 2021 etc).	32 posts on LinkedIn (not counting the interactions/posts in ICT4CART LinkedIn group), 178 posts on twitter in 2021, 3 videos on YoutTube. **Status: achieved**

			At least 70 announcements in social media channels;	**Mitigation measure**: Communicating the latest project results through project's social media pipelines and promoting them during upcoming conferences and events (e.g. ICT4CART final conference, ITS world 2021 etc).	70 posts/discussions on LinkedIn, 178 posts on twitter, 3 on YouTube, 2 on other social media. **Status: achieved**
			At least 2 social media campaigns;	**Mitigation measure:** Launch of a new social media campaign around pilot demo sites.	One social media campaign has been launched ("Meet ICT4CART: The Interview Series"), counting 20 interviews and relative social media coverage on twitter and LinkedIn at the end of the project (Feb 2022). Second social media campaign around the results of the ICT4CART has been launched between M37 and M42, counting live coverage from the final events, video interviews with the partners and the promotion of the technical newsletters. The key focus of this second social media campaign is the results of the project (the hashtag "#ICT4CARTresults" has been created). **Status: achieved**
Conferences /events – SEAB	ICT4CART consortium will be presented in relevant conferences and other events.	List of relevant events with a minimum level of participation	At least 10-15 events attended/year;		- 34 conference presentations - 7 booth/stand

	Partners' effort will focus on sharing consortium organised events and attending external sessions to disseminate project content, engaging targeted audience.	guaranteed; minimum number of attendees/participants engaged.			presentations **Status: achieved**
			At least 20 conference publications;	**Mitigation measures:** Communicating the latest project results and promoting project outcomes during upcoming conferences and events (e.g. ICT4CART final conference, ITS world 2021 etc).	- 1 newspaper interview - 15 technical paper publications **Status: partially achieved**
			At least 47 conference presentations;	**Mitigation measures:** Communicating the latest project results and promoting project outcomes during upcoming conferences and events (e.g. ICT4CART final conference, ITS world 2021 etc).	- 19 conference presentations +15 presentation of the technical papers **Status: partially achieved**
Technical papers & journal articles – SEAB	ICT4CART technical papers will be published in conference proceedings while research articles will be submitted to peer-reviewed scientific and technology journals.	Technical papers and research articles.	At least 3 papers/year;		15 technical publications **Status: achieved**
			At least 4 journal articles in total;		
Use of EU dissemination networks & tools – ATE	ICT4CART consortium will seek every opportunity to utilise the means offered by the EU such as H2020 magazine & others, to	Publications in EU tools and participation to EU events.	At least 5 publications and at least 5 events attended throughout the implementation		5 publications in EU media: -Success story in EU media, available here: https://bit.ly/2TCq33P -Inclusion in the AUTOMATED

	promote project's results.		of the project;		ROAD TRANSPORT HORIZON 2020 EU brochure, available here: https://ec.europa.eu/inea/sites/inea/files/art_brochure-2019.pdf -ICT4CART included in the AUTOMATED ROAD TRANSPORT HORIZON 2021 EU brochure, available here: https://cinea.ec.europa.eu/publications/automated-road-transport-way-connected-and-cooperative-automated-mobility-h2020_en -Final event twitted by CINEA: https://twitter.com/cinea_eu/status/1447571112133603330 -EUCAR Project book 2021, available at: https://www.eucar.be/wp-content/uploads/2021/11/DIGIT_PROJBOOK2021.pdf - Inclusion in the AUTOMATED ROAD TRANSPORT HORIZON 2020 EU brochure, available here: https://ec.europa.eu/inea/sites/inea/files/art_brochure-2019.pdf3 3 EU attended events: - EUCAD 2018, in conjunction withTRA2018; - EUCAR 2019; -5th European Conference H2020RTR21

					Status: **partially achieved**
Project events	ICT4CART includes in its implementation 3 pilot-sites demonstration events and one final International conference to achieve wider communication of activities.	Pilot-site demonstration events; final project event.	3 pilot-site events; & final international conference; at least 50 attendees per event for demonstration events; at least 120 participants for final international conference;	**Mitigation measure**: since the consortium hasn't been able to organise in person pilot sites events nor any other major event, the partners planned to have two major final events: one addressing a larger public at ITS World Congress (Hamburg, October 2021); one more technical organised in collaboration with Ulm's city Hall (Ulm, November 2021).	As highlighted in D9.3 submitted in August 2021, the consortium was not able to organise, in person, the 3 planned pilot-site events due to the current covid-19 pandemic. Nevertheless, the consortium has organised two final events in which the results of the projects were presented. The first event was held on 15 October 2021 in person during the ITS World Congress and counted 45 attendees. The second final event was held virtually on 12 November 2021 as part of the IEEE VNC and was attended by 43 stakeholders. (see section 5 for more details). **Status: achieved**
e-Newsletter	ICT4CART will produce and circulate a project newsletter starting from the end of year 1 to update the audience about project results and events.	4 e-Newsletter issues circulated to a list of subscribers.	At least 230 estimated recipients of the project e-newsletter;	**Mitigation measure:** two technical newsletters focused on the demo sites pilots planned to be released in the last 6 months of the project. Moreover, to gain more subscribers, a campaign on social media will be launched.	- 27 subscribers for the first issue of the e-Newsletter; - 54,1% opening rate compared to the average 21% opening rate for industries[2]; - 54 subscribers received the second newsletter; - 39,2% opening rate;

[2] Source: Mailchimp

					- The newsletters are also downloadable from the project's website, and they have had more than 100 interactions; - ICT4CART 1st technical newsletter was sent to 60 subscribers, and the opening rate was 48.8%.; - ICT4CART 2nd technical newsletter was sent to 64 subscribers and the opening rate was 32.1%; - ICT4CART newsletters, Technical Newsletters, and any other relevant information/interview concerning the project (e.g. Meet ICT4CART interview series, press releases, etc.) are shared also via the ERTICO Newsletter, which counts to date over 4000 subscribers and add therefore to ICT4CART readership. **Status: achieved**
Media coverage - ERTICO	Press releases will be issued frequently to achieve the publication of articles in popular and/or specialized	Press releases circulated to external press and online media to promote ICT4CART to a wide	25 estimated pieces of media clips achieved throughout project's	**Mitigation measures:** Between M37 and M42, new press releases on the demonstrations and on the	- 30 pieces of international media clips as of M41; - 1 city press meeting;

	media. ICT4CART partners will use every available local, national, and European press contact they have to communicate the overall project advances and results.	range of professionals and the general public.	implementation.	project's final results will be released, generating more articles and mentions of the project. Moreover, Austriatech will include ICT4CART in their newest report to be released later in 2021.	**Status: achieved**
Liaison & networking activities - ATE	ICT4CART will involve different groups in its activities in order to communicate the basic principles and the implementation of the relevant ICT tools proposed.	Liaison with related EU and international R&D initiatives, policy makers and related organizations; creation of synergies with past and future R&D projects and; liaison with already established networks, associations, organizations, related fora and technical communities.	Network with least 10 EU & national projects		Networked with 10 R&D projects. The ICT4CART project was also invited to present the ICT4CART results on the 5th European Conference H2020RTR21, Brussels, March 2022. **Status: achieved**
			At least 20 liaison activities performed;	**Mitigation measures**: further liaison activities will take place between M36 and M42 (for example, ICT4CART will be joining other 14 EU funded project in a workshop organised in September within the ICTR Conference[3]).	20 liaison activities have been established. **Status: achieved**
			Network with at least 8 organisations/platforms/associations	**Mitigation measures:** The ITS World Congress will be a great option to network with organisations in order to fully meet the KPI.	Networked with 8 organisations/platforms /associations. **Status: achieved**

[3] https://ictr.gr/Documents/workshops/WS_I_SHOW.pdf

Standardisation activities - LINKS	In the design and development phase, ICT4CART will contribute to European standardisation thanks to the strong connection with the European Telecommunications Standards Institute (ETSI).	Provide a strategic study on the existing and under development standards relevant for the ICT4CART project; liaise with relevant standardisation groups.	At least 5 standardisation bodies and TCs networked;		The main recipient of the ICT4CART standardisation efforts has been the European Telecommunications Standards Institute (ETSI). In general, the project partners performed a strategic study on the existing and under development standards that could be relevant for the ICT4CART project and have carried out several standardisation activities related to the scenarios demonstrated in the project (described in details in section 7). **Status: achieved**
Workshops/ special sessions/ discussions - SEAB	ICT4CART will include workshops, discussions and special sessions in the variety of channels used to ensure information flow and reach out to the targeted audiences.	Transmit project information, raise awareness, increase the project's impact size, extend the network.	At least 4 special sessions/workshops organised;		5 Special Interest Sessions **Status: achieved**
			At least 12 discussions in fora, committees and organisations;		Discussions around ICT4CART results and outcomes in: EUCAD 2018 Conference, ITS World 2018, ITS Cooperative mobility Services, ARCADE 2nd Stakeholder workshop, All energy exhibition & conference, ITS Europe 2019, Automated Vehicles Symposium, EUCAR Safe & Integrated Mobility Programme Board Meeting, ITS World 2019, TRB Annual Meeting 2020, IEEE International Mediterranean Conference on Communications and Networking, ICTR2021, 2021

					IEEE Vehicular Networking Conference, Ricardo corp. organisation, Innovationkongress Ulm, Smart City Week in Trento, International Symposium Cyber Security & IOT, Restart Mai CITY Plug & Play conference, Digital Transport Days 2019, ITS Hellas 2019, Agroverse Motion Forecasting Competition, EUCAD 2021, ITS Hellas 2021, 2 webinar discussions with ICT4CART AB (in M18 +M35 respectively), 1 ICT4CART stakeholder Forum Campaign discussion in M20. The project has also been presented at The general assembly of the "Cluster Electric Mobility South-West. After the end of the project, ICT4CART will still present its results at the 5th European Conference H2020RTR2021. Submission for a Special Interest Session at ITS European Congress (May 2022) together with EU funded projects 5G Iana and 5G-Loginnon. **Status: achieved**
Advisory board & Stakeholder	In the context of the liaison activities, ICT4CART will institute an Advisory Board	Promotion of the project's approach for the adoption of	At least 20 Advisory Board members;		10 Advisory Board members **Status: achieved**; The consortium decided to reduce

forum - ATE	and a Stakeholder Forum to ensure better diffusion of project's information and monitor dissemination & communication activities.	automated driving; synchronise efforts, explored synergies and avoid duplication of work.			the amount of the AB to ensure a more manageable size. That was described in D9.2 already
			At least 230 Stakeholder Forum members;	**Mitigation measures:** At least 191 followers on twitter that may be counted as Stakeholders on a serious note. 14 organisations, 6 platforms, 14 road authorities, 9 standardisation bodies and 41 projects where in each project the whole consortium was reached.	>269 Stakeholder Forum members **Status: achieved**
			Any other activity		- Presentation to Ricardo Corp-AIRBUS

3.2 Dissemination procedures and Dissemination Activity Report

SEAB, as T.9.2 Leader, has proceeded, since the project kick-off, with the creation of a repository for ICT4CART events and journals that are considered as valuable opportunities for the project. Throughout the execution of the project, the repository was regularly maintained by T.9.2 Leader and by the consortium partners. It included an indicative list of proposed scientific journals and proposed upcoming European and international events. In addition, ICT4CART partners were regularly informed through emails about upcoming key opportunities.

Moreover, for ICT4CART to produce high-quality publications and presentations and avoid overlaps and possible disclosure of restricted or confidential information, ICCS, as project coordinator, has provided the consortium with a set of dissemination procedures. The procedures include guidelines and set out the main steps to be followed by partners to publish or present the work done within the framework of the ICT4CART project.

The finalisation of every dissemination and/or communication activity within ICT4CART project is registered and described in the Dissemination activities report template by SEAB to facilitate the constant monitoring and tracking of ICT4CART activities.

The consortium members promptly filled the report within ten working days after the conclusion of the approved dissemination activity, together with the presented material (final paper, presentation, poster, etc.).

The detailed Dissemination procedures and the Dissemination activities requests table and the Dissemination activities report are available on the common internal collaborative tool (Redmine).

4 Communication activities

Next to the dissemination activities highlighted in the current section (section 4) of the present report, the ICT4CART consortium has developed specific communication tools (detailed in D9.4, D9.5, D9.6 and in table 2 below) implemented communication activities complimentary to the dissemination efforts, as well as built and managed ICT4CART online and media presence. Amongst other activities, the ICT4CART consortium has: built ICT4CART corporate and branding identity; created ICT4CART communication tools; built ICT4CART online presence (website and social media); issued newsletters; conducted partners interviews; maintained specific communication campaigns; conducted media related activities such as city press meetings, publication of press releases, and interviews in prominent national newspapers; created videos and visual assets; guaranteed promotion of the project in the channels of the members of the consortium (social media channels, websites, newsletters, etc). Finally, ad hoc communication activities have been performed to promote ICT4CART results and the demonstration activities.

A list of communication activities performed over the 42 months of ICT4CART may be found in table 2 below. D9.4, D9.5 and D9.6 offered a clear overview of the communication tools developed by the project.

Table 2: ICT4CART performed communication activities

Creation and maintenance of communications tools
- Creation of ICT4CART brand identity: ICT4CART logo, document templates, brand identity and guidelines - Creation of printed communications assets: ICT4CART roll-up banner; ICT4CART factsheet, ICT4CART flagship flyer, ICT4CART promotional postcard (distributed at 2021 ITS World Congress); - Creation and maintenance of ICT4CART website: www.ict4cart.eu; - Creation of videos: ICT4CART corporate video; one long video featuring interviews with some members of the consortium and relative social media teaser;
-
- Launch and maintenance of ICT4CART social media channels: 1. Twitter @ict4cart : 355 followers and aprox.336 tweets 2. LinkedIn @ICT4CART : 155 members of the LinkedIn Group and 51 started conversations - Launch of the campaign “Meet ICT4CART – interview series”; - Launch of the social media campaign #ICT4CARTresults; - Promotion of ICT4CART on the social media channels of the project partners;
e-Newsletters
- ICT4CART newsletter, issue 1, October 2019; - ICT4CART newsletter, issue 2, October 2020; - ICT4CART 1st Technical newsletter, December 2021; - ICT4CART 2nd Technical newsletter, February 2022;
Mass Media, press releases & news publications

M1-M6

- Press release in ERTICO newsroom and newsletter, 17/10/2018, ERTICO
- Article in Agenda Digitale, 06/11/2018, WINDTRE
- Article on ERTICO newsroom and newsletter, 05/12/2018, ERTICO
- Press meeting at the Ulm townhall, 11/12/2018, Ulm University, Nokia, BMW and Swarco
- Article in Suedwest Presse, 12/12/2018, UULM
- Article in Neu-Ulmer Zeitung, 12/12/2018
- Article in Schwaebische Zeitung, 12/12/2018
- Article in Autonomes Fahren, 12/12/2018

M7-M12

Article in Tom's hardware Italia, 04/03/2019

- Newspaper Interview in the Greek newspaper Kathimerini, 06/05/2019, ICCS

M13-M18

- Article in Agenzia Giornalistica Opinione, 13/09/2019, BRE
- Article in L'Adigetto, 13/09/2019, BRE
- Press release on Argoverse Motion Forecasting Competition, 20/1/2020, UULM
- Press release on Argoverse Motion Forecasting Competition, 29/1/2020, UULM
- Article in Ulm-News, 29/01/2020, UULM
- Article in IDW, 29/01/2020, UULM
- Article in Elekronitknet, 30/01/2020, UULM
- Article in Innovations Report, 30/01/2020, UULM
- Article in AutomotiveIT, 10/02/2020, UULM
- Article in Internationales Verkehrswesen, 12/02/2020, UULM
- Article in economy, 21/02/2020, UULM

M19-M24

- Article on publication of Urban Foresight new ICT4CART report: "Ground-breaking analysis of Europe's connected and autonomous vehicles market", 26/3/2020, Urban Foresight
- Article in Business daily GR, 17/06/2020
- Article in EnergyPress GR, 17/06/2020
- Article in Energia.gr, 17/06/2020
- Article in Metaforespress, 17/06/2020
- Article in 4TPOXOI, 18/06/2020
- Article in Sofokleous 10, 21/06/2020
- Article in EurActiv, 21/06/2020
- AustriaTech news, 24/06/2020, AustriaTech

M25-M30

- AustriaTech news, 28/10/2020, AustriaTech
- Article in ERTICO newsroom and newsletter, 24/11/2020, ERTICO
- AustriaTech news, 01/02/2021, AustriaTech
- AustriaTech Newsletter, 23/02/2021, AustriaTech

M31-M36

- Article in ERTICO newsroom and newsletter, 13/04/2021, ERTICO
- Article in ERTICO newsroom and newsletter, 27/04/2021, ERTICO
- Article in ERTICO newsroom and newsletter, 7/06/2021, ERTICO
- Article in ERTICO newsroom and newsletter, 29/06/2021, ERTICO
- Article in the online platform MondoMobileWeb, 08/07/2021, WindTre

M37-M42

- Article in ERTICO newsroom and newsletter, 08/09/2021, ERTICO

- Article in ERTICO newsroom and newsletter, 08/09/2021, ERTICO
- Article in ISENSE newsroom, 27/09/2021, ICCS
- Article in ERTICO newsroom and newsletter, 6/10/2021, ERTICO
- AustriaTech news, 08/10/2021, AustriaTech
- Article in ERTICO newsroom and newsletter, 27/10/2021, ERTICO
- AustriaTech news, 28/10/2021, AustriaTech
- Article in ERTICO newsroom and newsletter, 3/11/2021, ERTICO
- Article in ISENSE newsroom, 8/11/2021, ICCS
- AustriaTech news, 21/11/2021, AustriaTech
- Article in ERTICO newsroom and newsletter, 24/11/2021, ERTICO
- Article in ERTICO newsroom and newsletter, 15/12/2021, ERTICO
- Article in ERTICO newsroom and newsletter, 6/01/2022, ERTICO
- Article in ΑΠΕ-ΜΠΕ, 24/01/2022, ICCS
- Article in Metaforespress, 25/01/2022, ICCS
- Article in Epixerio, 25/01/2022, ICCS
- Article in ERTICO newsroom and newsletter, 26/01/2022, ERTICO
- Article in ICT Plus, 27/01/2022, ICCS
- Featured on Automobil Cluster, January 2022 (PDF file of the map here)

Specific communication activities to promote ICT4CART use cases

- Organisation of two final events (cfr. Section 3.3 of the current document for more details);
- Creation of video clip of ICT4CART demonstration activities (here video clip on smart parking use case, here video clip on automated crossing of urban intersection);
- Launch of a new social media campaign "#ICT4CARTresults";
- Publication of three press releases around the final events: PRESS Release Final event, 07/10/2021; Press release results of the ICT4CART project & final event, 21/10/2021;ICT4CART at IEEE Vehicular Networking Conference, 02/11/2021;
- Promotion of the ICT4CART results on the project's social media channels, as well as on the channels owned by the different members of the consortium (in 2021 alone there has been around 140 mentions of ICT4CART and its results on twitter alone);
- Publication of two technical newsletters featuring the results obtained by the consortium (first issue focused on Germany pilot site and cross-border case, the second issue focused on Italian and Austrian pilot sites);

5 Dissemination Activities and Event organisation

5.1 Dissemination and event activities plan and coordination

The consortium paid special attention to the project's dissemination activities when developing and updating the ICT4CART Communication Strategy & Plan (D9.1, D9.2 and D9.3). By effectively exploiting such opportunities, ICT4CART promoted broadly towards key target audiences and communities in the automotive industry the project results. The same activities also played a pivotal role in promoting and pushing towards wide acceptance of the technologies and paving the way for continuous R&D efforts, scale up and possible market uptake. Key tools leveraged to perform ICT4CART dissemination activities included, but were not limited to:

- Participation to European and international conferences, specialised meetings, fora, and working groups;
- Organisation of dedicated events (e.g. Special Interested Sessions, demonstration events, International conference etc.);
- The publication in peer review scientific & technical journals, conference proceedings and high reputational magazines, particularly targeting open access resources;

Throughout its execution, the ICT4CART project aimed to reach directly relevant target audiences and to endow ICT4CART project with higher visibility and impact. The production of several technical papers and articles, oral and/or poster presentation and the organization of exhibition booths and visits to international conferences, press conferences and audio-visuals ensured the continuous visibility of the project and its effective engagement with key stakeholders.

To compensate for the loss of events and dissemination opportunities caused by the global COVID-19 pandemic, the ICT4CART consortium leveraged online events, webinars and the few face-to-face meetings and events that took place over the last months to promote the project and its results. In order to reach a broad audience, the consortium organised two final events, one in person during the ITS World Congress 2021 (October 2021), and one remote during the IEEE VNC (November 2021). By showcasing the results of the project twice in front of different audiences the ICT4CART partners ensured the best possible breadth and outreach. More details on ICT4CART final events may be found in the next section 4.1.2. Table 2 featured in section 4.1.3 offers an exhaustive overview of all the activities carried out by the consortium.

5.2 ICT4CART Final Events

ICT4CART built on four specific high-value use cases (urban and highway), demonstrated and validated under real-life conditions at the following test sites: Austria; Germany; Italy; Italian-Austrian border.

Given the pivotal role played by those demonstration activities, ICT4CART defined in D9.1 and D9.2 a specific "communication and dissemination sub-strategy", which encompassed also the organisation of demonstrations events to be held at the different pilot sites. Both D9.1 and D9.2 being released before the pandemic made it impossible to held such events, the consortium introduced with D9.3 specific ad hoc measures and adapted its strategy to achieve the best possible results despite the challenging conditions and broadly spread the messages across the selected target audiences. In order to compensate for the fact that, due to the COVID-19 emergency, ICT4CART was not able to organize live demonstrations events at the pilot sites, the consortium decided to organize instead two final events targeting technical and scientific stakeholders, as well as the general public.

The "first" ICT4CART final event took place in person on Friday 15 October 2021, from 2 pm till 7 pm at the Hamburg (Germany). The ICT4CART's final event was held in conjunction with the ITS World Congress 2021, the world's largest event for ITS co-organised by our partner ERTICO. Thanks to this opportunity, ICT4CART "first" final event was uniquely positioned to attract both technical stakeholders, representatives from the European Commission and general public from all around the world, hence increasing the chances of future exploitation of the results. The event was generally well attended, with over 60 stakeholders present in loco.

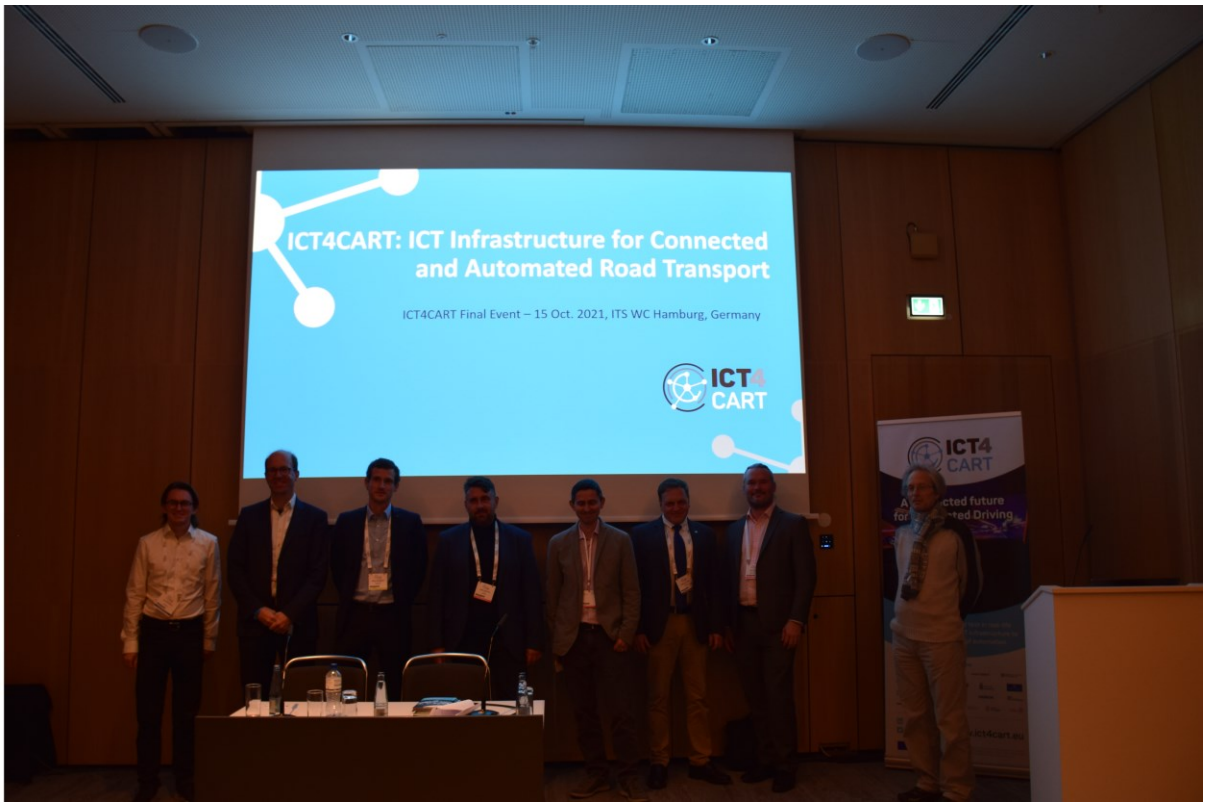


Figure 2: group picture of the speakers at the ICT4CART final event - 15 October 2021

The “second” final event of the ICT4CART project was held as an online Special Session on the 12th of November 2021 from 11:00 am to 3:00 pm CET at the 2021 IEEE Vehicular Networking Conference. The online format of the event allowed the consortium to reach out to relevant stakeholders who were not allowed to travel to Hamburg for the ITS World Congress and/or who were located in different countries and continents. Finally, the fact that this second final event was held during a well-established and recognized scientific forum such as the IEEE VNC guaranteed that through this event, the ICT4CART consortium could reach out to interested technical and academic audiences, hence increasing the chance of future exploitation of results.

During both conferences, ICT4CART’s partners presented the key activities carried out throughout the 42 months of the project, an overview of the demonstration activities and the use cases tested at the different pilot sites, and the main results achieved by the consortium. Moreover, during both events, the speakers showcased videos of the demo sites activities. Fruitful discussions and engaging Q&A sessions were held in both occasions, demonstrating the relevance of ICT infrastructure in today’s R&D.

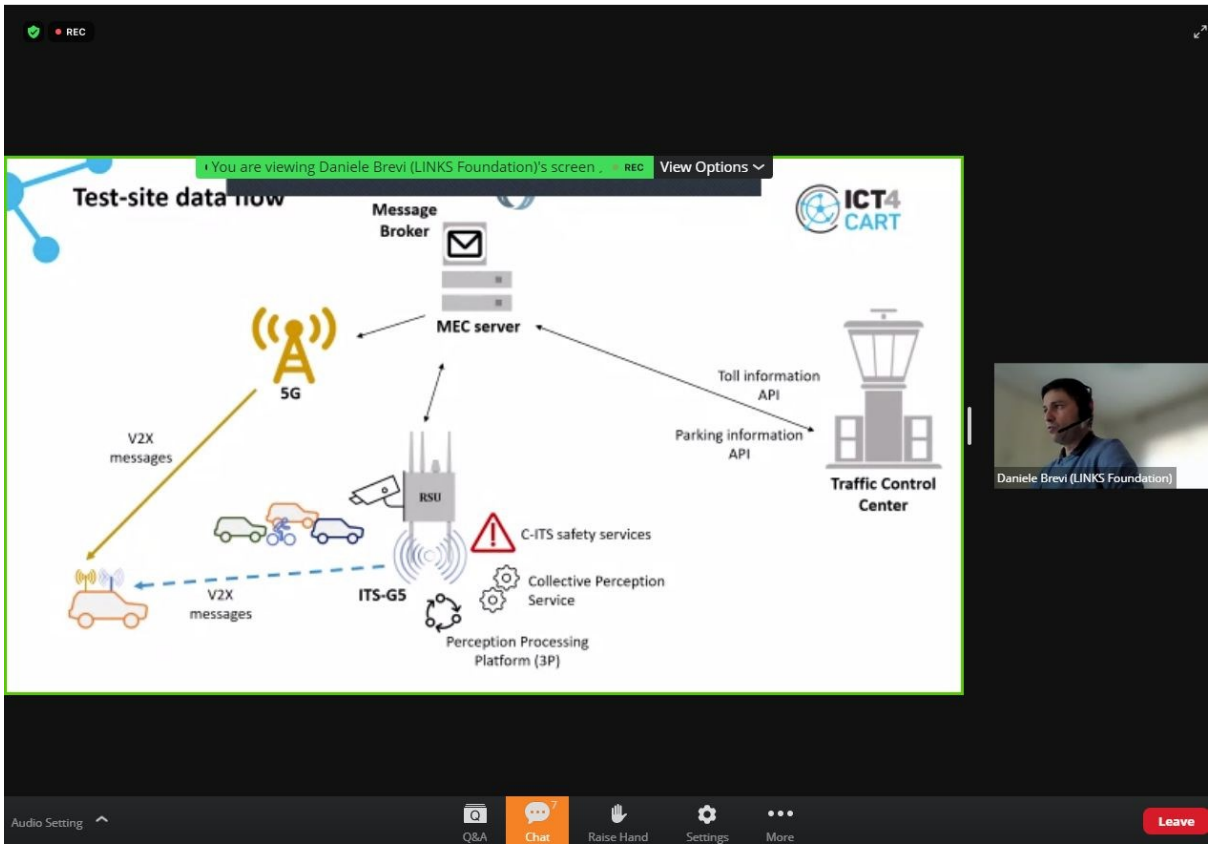


Figure 3: screenshot from ICt4CART second final event - Daniele Brevi (LINKS) presenting

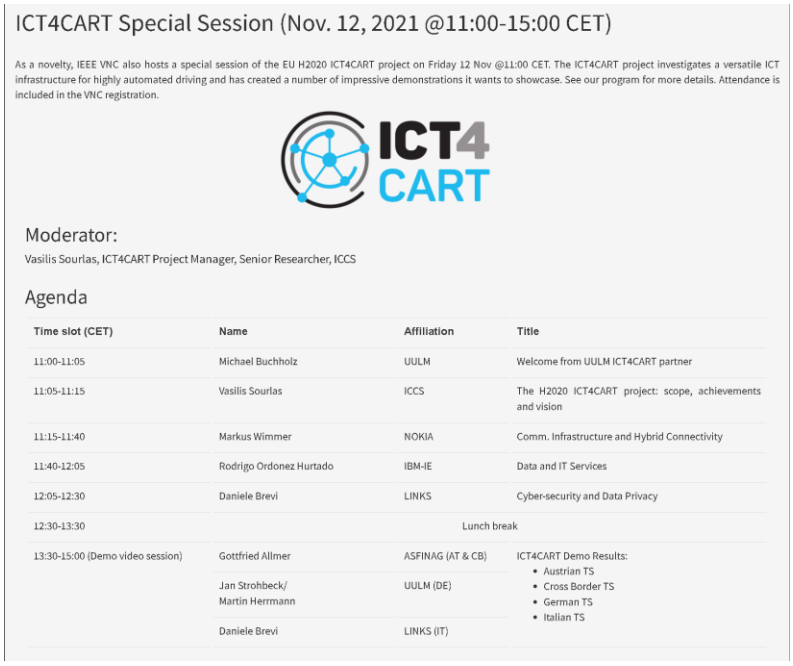
Extensive social media coverage of both events ensured an even broader outreach.

Below the agendas of both events:

Agenda

Time slot	Speaker	Topic
14:00 - 14:05	**Vladimir Vorotovic** – ERTICO	Welcome from ITSWC co-organizers
14.05 - 14.20	**Vasilis Sourlas** - ICCS	The H2020 ICT4CART project: scope, achievements and vision
14:20 - 14:30	**Pedro Alfonso Perez Losa** - CINEA	Welcome remarks from the Project Officer
14.30 – 14.50	**Markus Wimmer** - Nokia	Communication Infrastructure and Hybrid Connectivity
14.50 - 15.10	**Michael Buchholz** – Ulm University	Data and IT Services
15.10 - 15.30	**Edoardo Bonetto** - LINKS	Cyber-security and Data Privacy
15:30 – 16:00	**Dan Langford** – Urban Foresight	Cost modelling and business models
16:00 – 16:20	**Coffee break**	
16.20 - 17.10 (Demo video session)	**Gottfried Allmer** - ASFINAG **Jan Strohbeck/** **Martin Herrmann** - Ulm University **Alessandro Marchetto** -CRF/ **Daniele Brevi** LINKS	ICT4CART Demo Results - Austrian Test Site - Cross Border Test Site - German Test Site - Italian Test Site
17.10 – 18.00	**Open Discussion with Advisory Board members, the Project Officer and the participants** **Moderators: Vasilis Sourlas (ICCS), Lidia Buenavida Peña (ERTICO) and Elisa Todesco (ERTICO)**	

Figure 4: ICT4CART Final event at ITS World Congress - Agenda - 15 October 2021



ICT4CART Special Session (Nov. 12, 2021 @11:00-15:00 CET)

As a novelty, IEEE VNC also hosts a special session of the EU H2020 ICT4CART project on Friday 12 Nov @11:00 CET. The ICT4CART project investigates a versatile ICT infrastructure for highly automated driving and has created a number of impressive demonstrations it wants to showcase. See our program for more details. Attendance is included in the VNC registration.

Moderator:

Vasilis Sourlas, ICT4CART Project Manager, Senior Researcher, ICCS

Agenda

Time slot (CET)	Name	Affiliation	Title
11:00-11:05	Michael Buchholz	UULM	Welcome from UULM ICT4CART partner
11:05-11:15	Vasilis Sourlas	ICCS	The H2020 ICT4CART project: scope, achievements and vision
11:15-11:40	Markus Wimmer	NOKIA	Comm. Infrastructure and Hybrid Connectivity
11:40-12:05	Rodrigo Ordonez Hurtado	IBM-IE	Data and IT Services
12:05-12:30	Daniele Brevi	LINKS	Cyber-security and Data Privacy
12:30-13:30	Lunch break		
13:30-15:00 (Demo video session)	Gottfried Allmer	ASFINAG (AT & CB)	ICT4CART Demo Results: • Austrian TS • Cross Border TS • German TS • Italian TS
	Jan Strohbeck/ Martin Herrmann	UULM (DE)	
	Daniele Brevi	LINKS (IT)	

Figure 5: ICT4CART Final event at IEEE VNC - Agenda - 12 November 2021

Performed dissemination activities

Table 3 (below) lists the activities performed during the implementation of the ICT4CART project:

Table 3: ICT4CART performed dissemination activities

Conferences
- Project presentation at the EUCAD 2018 Conference (in conjunction with TRA2018) in Vienna, 20/04/2018, ICCS - Testing of the OBU at the ITS Cooperative Mobility Services Event in France, 25/02/2019, LINKS - Project Presentation at ARCADE 2nd Stakeholder workshop in Brussels, 04/04/2019, ICCS, ASFINAG, SWARCO - Project Presentation at All-Energy exhibition and conference in Glasgow, 15/05/2019, Urban Foresight - Project Presentation at ITS Europe 2019 in Netherlands, 06/06/2019, ICCS - Project Presentation & Panellist at Automated Vehicles Symposium in Orlando, 16/07/2019, ICCS - Project Presentation at EUCAR Safe & Integrated Mobility Programme Board Meeting in Brussels, 19/19/2019, ICCS - Project Presentation at ITS World 2019 in Singapore, 21-25/10/2019, ICCS - Project Presentation at TRB Annual Meeting 2020 in Washington, 16-20/01/2020, ICCS - Project Presentation at ICTR 2021 meeting in Rhodes, Greece, 05-08/07/2021, ICCS - Project presentation at the general assembly of the "Cluster Electric Mobility South-West", 15/02/2022, UULM
Special Interest Sessions
- ITS World 2018, SIS36: 'ICT Serving Automated Road Transport', Copenhagen, 18/09/2018, ICCS, ERTICO, IBM-Z, NOKIA - ITS Europe 2019, SIS13: 'Touching the real infrastructure and embracing the unknown', The Netherlands 04/06/2019, SWARCO, SEAB - ITS Europe 2019, SIS14: 'Truck automation & platooning', The Netherlands, 04/06/2019, ICCS - IEEE International Mediterranean Conference on Communications and Networking, 5-8/07/2021, ICCS - 2021 IEEE Vehicular Networking Conference, 10-11/11/2021, ULM - ITS Europe 2022, "5G for ITS: communications and computational challenges and prospects", ICCS, LINKS Foundation, INTERNET INSTITUTE, Centro Ricerche Fiat, Vedecom (expecting approval)
Journal Publications/ Technical Papers
- TRA2018, End-to-End latency in HAD applications using cloud technology, Copenhagen, 18/04/2018, Vienna, Austria, "doi: 10.5281/zenodo.1486544" - PKC 2019: Public-Key Cryptography – PKC 2019, Group Signatures with Selective Linkability, 14-17/04/2019, https://doi.org/10.1007/978-3-030-17253-4_7 - IEEE ITSC 2019, Environment Modeling Based on Generic Infrastructure Sensor Interfaces Using a Centralized Labeled-Multi-Bernoulli Filter, 27-30/10/2019, 10.1109/ITSC.2019.8916923 - IEEE ITSC 2019, LACI: Low-effort Automatic Calibration of Infrastructure Sensors, 27-30/10/2019, 10.1109/itsc.2019.8917310 - 2019 IEEE Global Communications Conference (GLOBECOM), Virtual CDN providers: Profit maximization through collaboration, 09-13/12/2019, 10.1109/GLOBECOM38437.2019.9014298 - TRA2020, Enabling automated driving by ICT infrastructure: a reference architecture, March 11, 2020, https://arxiv.org/abs/2003.05229

- MFI 2020 (2020 IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems), LMB Filter Based Tracking Allowing for Multiple Hypotheses in Object Reference Point Association, Accepted 03.08.2020, 10.1109/MFI49285.2020.9235251
- IROS 2020 (2020 IEEE/RSJ International Conference on Intelligent Robots and Systems), Multiple Trajectory Prediction with Deep Temporal and Spatial Convolutional Neural Networks, DOI: 10.1109/IROS45743.2020.9341327
- DeGruyter: AT – Auto-matisierungstechnik, Subjective Logic Reasoning: An Urn Model Intuition and Application to Connected Automated Driving, Accepted 02.12.2020, https://doi.org/10.1515/auto-2020-0097
- IEEE in Transactions on Services Computing (IEEE TSC), Resource Provisioning and Allocation in Function-as-a-Service Edge-Clouds, DOI Bookmark: 10.1109/TSC.2021.3052139
- Public Key Cryptography 2021, Group Signatures with User-Controlled and Sequential Linkability, Short URL: ia.cr/2021/181
- ITS World Congress 2021, Spatial Positioning Token (SPToken) for Smart Parking, DOI:10.1109/TITS.2020.3029537
- IEEE MeditCom 2021, Implementation and Latency Assessment of a Prototype for C-ITS Collective Perception, DOI: 10.1109/MeditCom49071.2021.9647572
- IROS 2021 (2021 IEEE/RSJ International Conference on Intelligent Robots and Systems), DeepSIL: A Software-in-the-Loop Framework for Evaluating Motion Planning Schemes Using Multiple Trajectory Prediction Networks, DOI: 10.1109/IROS51168.2021.9636423
- 2021 IEEE Vehicular Networking Conference (VNC), An Extension Proposal for the Collective Perception Service to Avoid Transformation Errors and Include Object Predictions, DOI: 10.1109/VNC52810.2021.9644655

EU tools

- ICT4CART success story at EU media, 28/02/2019
- Included in the AUTOMATED ROAD TRANSPORT HORIZON 2020 EU brochure, 03/2019
- ICT4CART Final event, Retweeted by CINEA, 11/10/2021
- Included in the AUTOMATED ROAD TRANSPORT HORIZON 2021 EU brochure, 08/10/2021

Booth/Stand presentation

- International Symposium Cybersecurity & IOT, 23/05/2019, AIRBUS
- Smart City Week in Trento, 16-22/09/2019, BRE
- Restart mAI City Plug & Play Conference, 26-28/09/2019, ICCS
- Digital Transport Days 2019, 07-09/10/2019, ERTICO
- ITS Hellas 2019, 17-18/12/2019, SEAB
- Competition winning, Argoverse Motion Forecasting Competition, 12/2019, UULM
- EUCAD 2021 conference, 20-22/04/2021, ICCS
- Featured at ERTICO booth at 2021 ITS World Congress, ERTICO, 10-15/10/2021
- ITS Hellas 2021, 08-09/12/2021, SEAB
- ICT4CART will be presented in the session "ICT infrastructure for road transport”on 29 March 2022 at H2020RTR21, ICCS

Other activities

- ICT4CART project Overview, Presentation to Ricardo company, 22/11/2018, AIRBUS
- Presentation on the Technical University of Applied Sience in Ulm, at the "1. Innovationskongress Ulm" (first innovation congress Ulm), "Ein virtueller Spiegel: Unterstützung vernetzter automatisierter Fahrzeuge

durch Infrastruktursensorik" (A virtual mirror: Support of connected automated vehicles by infrastructure sensors)", 05/05/2019, UULM

- Publication of the report "Market needs for connected and Automated Road Transport", 26/03/2020, Urban Foresight
- ICT4CART mentioned as part of the Connected and automated transport technologies, research projects and pertinent SSMS Flagship in the research paper entitled 'Research and Innovation Supporting the European Sustainable and Smart Mobility Strategy: A Technology Perspective from Recent European Union Projects', https://www.mdpi.com/2076-3417/11/24/11981/htm

Figure 6: ICT4CART displayed at ITS Hellas 2021

6 Liaison and Networking Activities

In order to communicate the ICT4CART basic principles and the implementation of the relevant ICT tools proposed by ICT4CART, the partners have involved different groups in their activities. Within the framework of Task 9.3, the planning and execution of ICT4CART liaison with related EU and international R&D initiatives, policy makers and related organisations have been carried out. The main outcome of liaison and networking activities was the broad promotion of the project's holistic approach for the adoption of automated driving, synchronising efforts, exploring synergies and avoiding of double work. To achieve this, the partners of Task 9.3 performed:

a) Establishment of the Advisory Board and Stakeholder Forum;

b) Creation of synergies with past and future R&D projects;

c) Liaison with already established networks, associations, organizations, related fora and technical communities;

6.1 Networking and knowledge exchange

To maximise its impact, increase synergies and avoid overlaps ICT4CART built on existing initiatives and projects in the EU in the field of connected and automated road transport. The Consortium established strong links with all major activities, mainly through common partners; it also got in touch and informed key public stakeholders such as regional, national and European authorities about the benefits of the ICT4CART ICT infrastructure for the promotion of Highly Automated Driving in Road Transport. Figure 7 and Table 4 below provide details in relation to the groups of stakeholders and their engagement plan throughout ICT4CART's implementation:

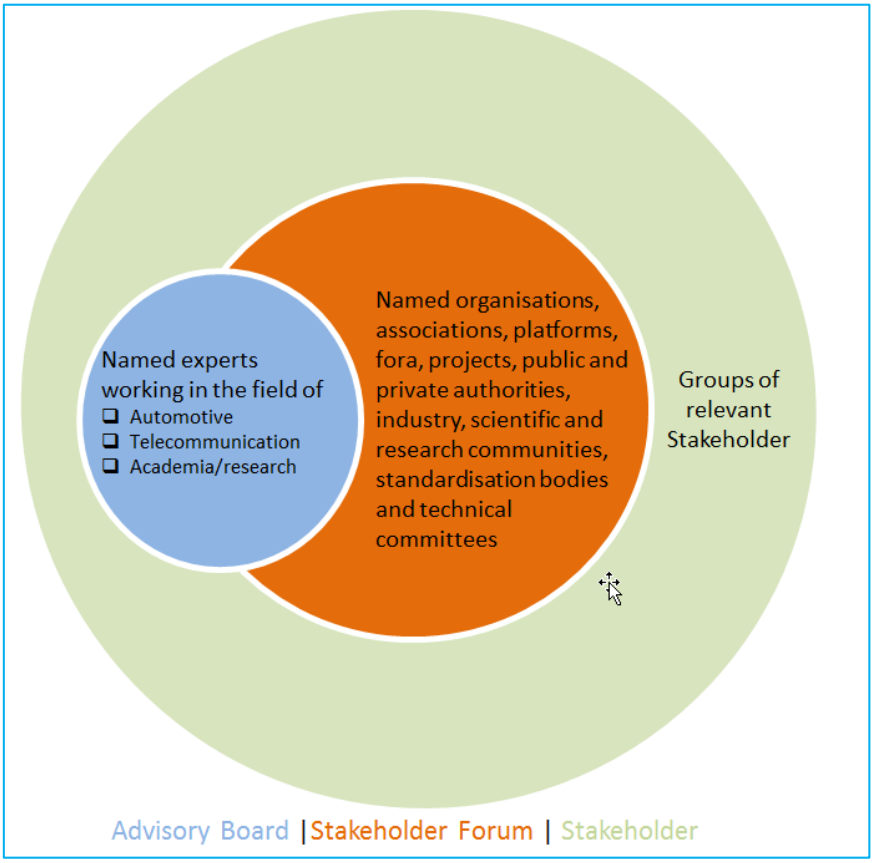


Figure 7: Overview of relevant Stakeholder

Table 4: ICT4CART Stakeholder engagement plan

Stakeholder engagement plan	Start	End
Identifying stakeholders	M01	M06
Formation of groups and election of representatives for the Advisory Board	M05	M18
Focused engagement with key stakeholders on specific aspects, communication through established channels (meetings, demonstration events)	M13	M42
Communication with the Stakeholder Forum through e-newsletters, social media campaigns, etc.	M13	M42
Up-to-date information provided through the project's website about the consortium's work progress and outcomes to end-users and the general public	M07	M42

Stakeholder engagement plan	Start	End
A number of periodic social media campaigns/activities to inform and attract frequent social media users and invite them to provide feedback. This channel will be used to expand the members of the ICT4CART Stakeholders Forum.	M01	M42
Special press releases and other PR activities will be sent to various media outlets across Europe to promote to a wide range of professionals and the general public.	M01	M42
Scientific publications and technical presentations in renown conferences and fairs	M01	M42
Participation/presentation/demonstrations in relevant events	M01	M42
Bilateral discussions and dedicated presentations in respective technical committees and fora	M01	M42
Creation and implementation of synergies with past and future R&D projects	M01	M42
Liaison activities with networks, associations, organizations, related fora and technical communities	M03	M42

6.2 Advisory Board and Stakeholder Forum

To ensure effective networking and knowledge exchange, an Advisory Board (AB) was formed by external professionals, involving different groups (automotive, ICT, telecommunication, academia) and utilising the existing networks in the consortium. Thus, a broad pool of experts was set up.

The main objective of the AB was to facilitate ICT4CART partners working in the automotive sector in contacting experts from the related organisations and associations, to inform them about the project's vision and objectives, and consult on the ICT4CART use cases and proposed ICT Infrastructure. The partners, working in the field of telecommunication, could consult with professionals from the related industry in the AB to get their feedback regarding the proposed hybrid communication approach, network slicing and edge computing in the interoperable IT environment. Academic partners had invited professional researchers as well as professors/researchers in the area of Transport, Telecommunications and Automation from the AB to give them feedback about the proposed infrastructure. The area of expertise of the members of the AB has been highlighted in Table 6 below. Even though the estimated number of AB members reported in the Description of Activities was 20, the ICT4CART Consortium, after thoroughly discussing the matter, had decided to limit this number to ensure a more manageable size, hence relevant contacts and networking with the targeted stakeholders. It was particularly important to the project for the identified areas of expertise and professions to be equally represented. A list of the members of the AB is provided in Table 5 below.

Table 5: ICT4CART Advisory Board members

	Area of expertise					Profession					
Organisation/project	**ICT Architecture**	**Hybrid connectivity**	**Data Management**	**Cyber-security / Data privacy**	**Accurate localisation**	**Researcher / academic**	**Road operators**	**Telecom operators**	**ICT/ Equipment**	**OEMs/ Automotive**	**others**
ERAdiate+ Department of International Research Projects http://www.erachair.uniza.sk/	✓		✓	✓		✓					
AUVSI Association for Unmanned Vehicle Systems International https://www.auvsi.org/	✓					✓			✓	✓	✓
AVL List Independent company for the development, simulation and testing of powertrain systems https://www.avl.com/	✓	✓	✓			✓				✓	

	Area of expertise					Profession					
Organisation/project	**ICT Architecture**	**Hybrid connectivity**	**Data Management**	**Cyber-security / Data privacy**	**Accurate localisation**	**Researcher / academic**	**Road operators**	**Telecom operators**	**ICT/ Equipment**	**OEMs/ Automotive**	**others**
Bast German Federal Highway Research Institute http://bast.de/		✓					✓				
Oppida Expert consulting firm in Information Systems Security https://www.cybersecurityintelligence.com/				✓							✓
Chair of Connected Mobility Technical University of Munich https://www.cm.in.tum.de/home/		✓				✓					
DLR German Aerospace Center https://www.dlr.de/EN/					✓	✓					
ECTA European Competitive Telecommunications Association https://www.ectaportal.com/	✓							✓			
MAGYAR KÖZÚT Hungarian Public Road Operator https://internet.kozut.hu/en/		✓					✓				
DRMP Inc. Transportation Design Department. https://drmp.com/											✓

The AB is the core of a broader group of experts and relevant stakeholders that forms the ICT4CART Stakeholder Forum. The Stakeholder Forum had been continuously extended during the project's duration and was kept informed on a regular basis about ICT4CART major achievements and work progress through the ICT4CART e-newsletter, the social media activities, press articles, physical/remote meetings/workshops etc.

Moreover, the Stakeholder Forum members' were invited to the ICT4CART demonstration events to learn more about the proposed solutions and provide feedback according to their needs.

During the project, demonstration events had been held at each ICT4CART test site (Italy, Austria and

Germany), in order to showcase the ICT4CART solutions to the members of the Advisory Board and the Stakeholder Forum, as well as to relevant authorities and standardisation bodies, end user communities, related industries, researchers, academia and any other interested persons. The integration and testing activities at the different test sites was defined in WP7.

In addition, the ICT4CART's Final international Conference was held at the end of the project to present project's results through technical and live demonstrations to a large number of stakeholders. The full list of stakeholders is provided in Annex 1.

6.3 Advisory Board & Stakeholder Engagement

A first webinar was held in M18 (February 20th, 2020) in order to introduce the project to the Advisory Board members.

The webinar contained a general overview of the project by the coordinator, ICCS, as well as presentations on the Communication Infrastructure (WP4, NOKIA), Data and IT Services (WP5, IBM IE) and Cyber Security (WP6, AIRBUS). The Advisory Board members showed interest by questioning the content and providing their opinion on the project. Furthermore, the project partners stayed in contact with the AB in order to get consultancy on various deliverables before they were submitted. The consortium therefore decided to host a second webinar in a later stage, where milestones of the project are to be presented.

The second webinar was held in M35 (July 8th, 2021), where the project partners presented the main results since the first webinar. As in the first webinar, the AB members were given an update on the Communication Infrastructure, Data and IT Services and Cybersecurity. In the second webinar, however, the test sites were introduced, where each system architecture was presented along with the tests that were conducted so far. The AB members were able to exchange with project partners, who haven't participated in the first webinar, thereby strengthening the cooperation between the consortium and the AB. With two successful webinars being conducted, the Advisory Board members were invited to participate in the Final event, which took place at the ITS World Congress in Hamburg in October 2021.

The Stakeholder Forum was contacted in a special campaign in M20, where they have been informed about the project activities and to draw their attention to ICT4CART's social media channels and the newsletter. A second contact campaign was conducted in M36 containing the status of the demonstration phase as well as an invitation to the Final Conference in Hamburg.

6.4 Liaison Activities

Networking with relevant associations, organisations and European R&D initiatives is very important to ensure knowledge exchange between key actors and the adoption of the proposed solutions. First collaborations have already taken place within the framework of joint preparations of various presentations, mostly for conferences and other events (see Table 6 below). Task 9.6 planned several interactions with standardization bodies. In the first phase, contacts (mainly with ETSI and C-ROADS) have been mostly informative; while in the second phase, once ICT4CART entered the implementation and testing part, more concrete feedback was asked from the relevant stakeholders whom were engaged in the process. The following section 7 will detail more about the standardisation activities.

Table 6: List of Liaison activities

No.	Name of organisation	Status of collaboration	On regard to task force/topic
1	INFRAMIX	Established	Hybrid infrastructure
2	C-Roads	Established	C-ITS. First exchange about broker usage with TF4 of the C-ROADS platform WG2
3	CONCORDA	Established	Connected services and technologies
4	C2C CC	Established	C-ITS
5	5G-MOBIX	Established	Similar scope as ICT4CART
6	5G-PPP/5GIA	Established	5G project x-Coordination
7	5GAA	Established	5G and automotive
8	ETSI Multi Access EDGE Computing (MEC) group	Established	MEC applications in ICT4Cart LINKS is a group member and can present the ICT4CART activities in the group
9	ETSI Collective Perception Messages Working group	Established	use of CPM messages in a real UC
10	WG for intelligent mobility – Electricmobility South-West Germany	Established	Intelligent mobility
11	PACV2X	Established	French project about cooperative augmented perception in V2X context, PACV2X provided base messages for tolling message definition to ICT4CART
12	MEC-VIEW	Established	EPM building and prediction, virtual mirror use case, requirements, mobile network
13	LUKAS	Established	hybrid communication, EPM building and prediction, interfaces and messages types, mobile network
14	ETSI working group on Use cases description	Established	Description of basic set of applications Release 2, technical report describing additional ITS use cases Contribution about relevant use cases tested in ICT4CART. Publishing is expected in a few months
15	ETSI Working Group 1 - Application Requirements and Services	Established	Parking notification service, started discussion for potential service standardization

16	ARCADE	Established	Connected services and technologies
17	WISE-ACT	Established	Data governance for autonomous and connected vehicles
18	LEVITATE	Established	Impacts of automated vehicles on traffic safety
19	SUaaVE	Established	Behaviour of connected and automated vehicles
20	SPROUT	Established	Exchange on use cases in urban areas
21	5G-IANA	Established	5G for ITS
22	5G-LOGINNOV	Established	5G for ITS

7 Standardisation Activities

The ICT4CART project aimed, among other things, at contributing to standardisation, as stated in section 1.1 of the Grant Agreement. During the design and development phases, the ICT4CART partners agreed to follow standardized approaches and to work towards contributing to European standardisation activities. The main recipient of the ICT4CART standardisation efforts has been the European Telecommunications Standards Institute (ETSI), which has a strong connection with the project itself and was engaged signing a Letter of Support.

Under task 9.6, the relevant ICT4CART partners performed a strategic study on the existing and under development standards that could be relevant for the ICT4CART project. This study helped identify standardisation areas, where contributions from the ICT4CART project could be provided. It also helped decide which standardisation groups to contact to ensure that the ICT4CART solutions are built on emerging standards to facilitate their acceptance and market uptake.

The outcomes of the strategic study are highlighted in the following subsections, together with a description of the specific actions undertaken by the consortium in ths realm.

7.1 ETSI Technical Committee (TC) on Intelligent Transport Systems (ITS)

One of the main recipients of the ICT4CART standardisation contributions is the ETSI Technical Committee (TC) Intelligent Transport Systems (ITS). This TC is in charge to standardise all aspects related to the ITS framework, which is also the main focus of the ICT4CART project.

Based on the activities of the ICT4CART project and on the ongoing activities of the ETSI ITS TC, the study identifies two main contributions that can be provided. The first one relies on the outcomes achieved in the demonstration of the ICT4CART scenarios. The second contribution is related to the hybrid communication aspect, which is pivotal in the technical ICT4CART solution.

7.1.1 Standardisation activities related to the scenarios demonstrated in ITC4CART

7.1.1.1 Second release of ETSI ITS Basic Set of Applications (ETSI TR 102 638)

The demonstrations of the parking availability notification service, wrong-way driving and approaching to the toll barrier scenarios in the context of the ICT4CART project have been introduced in the ETSI TR 102 638 release 2.

This ETSI Technical Report is in drafting phase, and it contains the second release of Basic Set of Applications to be considered in ETSI ITS. Further standardisation activities may start after the

publication of this technical report. These activities can exploit the results obtained from the demonstration of the ICT4CART scenarios.

7.1.1.2 Collective Perception Service

UULM and LINKS implemented the C-ITS service called Collective Perception Service (CPS), responsible to provide to the connected and automated vehicle the information retrieved from roadside infrastructure sensors. This service is being standardised in ETSI, and a first ETSI technical report, i.e., ETSI TR 103 562 V2.1.1 (2019-12), that describes the syntax of messages and their generation rules, is available.

A standardisation action has been carried out in relation to this topic: UULM and LINKS provided feedback to ETSI on the CPS based on the currently available ETSI technical report.

UULM and LINKS interacted with the Rapporteur of the ETSI ITS WG1 Work Item on Cooperative Perception Services (ETSI TS 103 324) to introduce a proposal of UULM for CPM extension. As outcome of the interaction, the Rapporteur confirmed that the proposal of UULM was of interest and that a similar proposal from CAR 2 CAR Communication Consortium was already tackling the issues identified by UULM in the current CPM standardisation. No further standardisation actions have been done since due to a six-month break in the ETSI CPS standardisation activities.

7.1.1.3 C-ITS message for parking availability

The Italian ICT4CART Partners involved in the scenario 1.2 “Parking management” in Verona, Italy, defined the specification of a new type of C-ITS message to provide information about the parking lot, and in particular about parking availabilities, to the connected and automated vehicles. The syntax of this message is not standardised, but a C-ITS message for parking information is expected to be present amongst the set of C-ITS messages.

LINKS presented the defined message in the ETSI ITS meeting in June 2020. A standardisation activity could be foreseen for this topic. The message defined in the ICT4CART project together with the feedback after the scenario demonstration can be exploited when standardisation for the parking availability service will begin in the context of ETSI ITS standardization activities.

7.1.1.4 Trust and privacy in ITS communications

The trust and privacy management for ITS communications has been deeply revised in the latest releases of ETSI ITS standards (i.e., ETSI TS 102 941 V2.1.1 and ETSI TS 103 097 V2.1.1). ETSI ITS organized Plugtests for checking the interoperability of the new solutions among different

implementations. LINKS participated to these events, in the context of ICT4CART activities, with its own implementation to provide its feedback about the new versions of the standards.

7.1.2 Hybrid communication

One of the key ICT elements characterizing the ICT4CART project is the hybrid communication (i.e., ensuring the communication using both short-range and long-range communication solutions). The ICT4CART Partners that have implemented the hybrid communication take as reference the approach described in the document “C-ITS IP Based Interface Profile” of the C-Roads Platform.

The implementation of a hybrid communication solution is a new achievement and there are no indications from ETSI ITS detailing how this solution should be. One active standardization Work Item will provide its outcomes in the ETSI TR 102 962 that deals with the topic of Public Mobile Networks support in Cooperative ITS. ICT4CART Partners can provide their feedback on hybrid communication to this Work Item or to future new ETSI ITS Work Items dealing with this topic.

7.1.3 ETSI MEC Industry Specification Group (ISG)

The MEC framework is being standardised from ETSI in the Multi-access Edge Computing (MEC) initiative is an Industry Specification Group (ISG). The ICT4CART project can contribute to this standardisation topic since the MEC is among the main topics of the project and it is used in several ICT4CART scenarios.

The strategic study identifies two main topics on which ICT4CART can contribute to the standardization activities of the MEC ISG.

7.1.3.1 V2X Information Service API (ETSI GS MEC 030)

This group specification defines the API for the exchange of information related to V2X data flows between the MEC platform and MEC applications. In the ICT4CART project, several applications have been developed for the MEC context. A contribution to this standardization activity can be provided from the involved ICT4CART Partners for enhancing the API based on the experience gained in the development of MEC applications needed for the demonstration of ICT4CART scenarios.

7.1.3.2 ICT4 Geo Service

The ICT4CART Geo Service is a cloud component, developed by IBM, whose objective is to provide to the vehicles the connection information about which MEC server should be contacted for exploiting a specific service. As the MEC server covers only a specific limited area, the Geo Service provides the

information about the available services on a MEC server for a given area. Indeed, as the vehicle moves, it should know which is the next MEC server to which it should connect to.

The procedure for getting this information is not yet defined in the standardization. The solution implemented in the ICT4CART can be a starting point for the definition of a standard procedure in the context of ETSI MEC ISG.

8 Conclusions

The current deliverable D9.7 is the final report on the communication, dissemination and liaison activities performed by the ICT4CART consortium over the 42 months of the project. D9.7 is strictly correlated to D9.1, D9.2 and D9.3, showcasing the concrete implementation of the ICT4CART communication and dissemination strategy developed throughout the years. It is also strictly related to D9.4, D9.5 and D9.6, which offered the framework for the creation of the communication tools, that played a key role in ensuring high visibility to the project, resulting in creating a strong brand identity and in paving the road to future uptake and exploitation activities.

As the final report on the communication, dissemination and liaison activities, the current D9.7 reviews ICT4CART KPIs and benchmark the actual performances of the consortium against the goals set at the beginning of the project. The fact that the largest part of the KPIs has been met, despite the disruption brought to networking, dissemination and communication activities by the Covid-19 pandemic, showcases the strength of the project and its consortium.

Finally, to ensure an even longer shelf life to ICT4CART and its results, the project website will be kept alive for the next five years. This contributes to guaranteeing free and open access to the results of the project and ensuring that information about the project is effectively communicated beyond the project's lifetime.

Annexes

Annex 1 – Full list of stakeholders and AD members

Stakeholder	Stakeholder Forum
Organisations and associations in the field of automotive or ICT	
ACEA European Automobile Manufacturers' Association https://acea.be/	✓
Amsterdam Group Strategic alliance with the objective to facilitate joint deployment of cooperative ITS in Europe https://amsterdamgroup.mett.nl/	✓
AUVSI Association for Unmanned Vehicle Systems International https://www.auvsi.org/	✓
California PATH California Partners for Advanced Transportation, University of California https://path.berkeley.edu/	✓
ERTRAC European Road Transport Research Advisory Council. Participation in the ERTRAC WG on Connectivity and Automated Driving https://www.ertrac.org	✓
FEHRL Forum of European National Highway Research Laboratories https://www.fehrl.org/	✓
EUCAR European Council for Automated R&D https://eucar.be	✓
TRB Transport Research Board http://www.trb.org/	✓
NDS Association The Navigation Data Standard for map data in automotive eco-systems https://nds-association.org/	✓
EARPA European Automotive Research Partners Association https://www.earpa.eu/	✓
CLEPA European Association of Automotive Suppliers https://clepa.eu	✓
C2C-CC Car 2 Car Communication Consortium	✓

Stakeholder	Stakeholder Forum
https://www.car-2-car.org/	
5GAA 5G Automotive Association https://5gaa.org/	✓
EATA (LoS signed) European Association for Transactional Analysis https://eatanews.org/	✓
Related platforms and fora	
Open AutoDrive Forum The cross-domain platform driving standardizations in the area of autonomous driving http://www.openautodrive.org/	✓
SENSORIS Innovation Platform Sensor Interface Specification to exchange information between in-vehicle sensors and a dedicated cloud, and between clouds https://sensor-is.org/	✓
EU EIP European ITS Platform - Sub-activity 4.2 https://eip.its-platform.eu/	✓
EATA European Automotive and Telecoms Alliance https://eata.be/	✓
C3S Connected Cars and Cyber Security Chair https://chairec3s.wp.imt.fr/	✓
AVS Automated Vehicle Symposium, Orlando https://www.automatedvehiclessymposium.org/	✓
R&D or implementation projects	
ARCADE Aligning Research & Innovation for Connected and Automated Driving in Europe follow-up project of CARTRE https://connectedautomateddriving.eu/about/arcade-project/	✓
C-Roads Platform of Harmonised C-ITS Deployment in Europe https://www.c-roads.eu/platform.html	✓
CONCORDA Connected Corridor for Driving Automation https://connectedautomateddriving.eu/project/concorda/	✓
L3Pilot SAE Level 3 Driving Automation https://l3pilot.eu/	✓

Stakeholder	Stakeholder Forum
NeMo Hyper-Network for electroMobility https://nemo-emobility.eu/	✓
SAFERtec Security Assurance Framework for Networked Vehicular Technology https://www.safertec-project.eu/	✓
SerIoT Secure and Safe Internet of Things https://seriot-project.eu/	✓
CTI Cybersecurity of Intelligent Transportation https://www.irt-systemx.fr/en/projets/cti/	✓
INFRAMIX Preparing road infrastructure for mixed vehicle traffic flows https://www.inframix.eu/	✓
AUTOPILOT Automated Driving Progressed by Internet of Things https://autopilot-project.eu/	✓
InterCor Interoperable Corridors deploying cooperative intelligent transport systems https://intercor-project.eu/	✓
ABC4Trust Attribute-based Credentials for Trust https://www.abc4trust.eu/	✓
5G-MOBIX 5G for cooperative & connected automated MOBIility on X-border corridors https://www.5g-mobix.com/	✓
interACT Designing cooperative interaction of automated vehicles with other road users in mixed traffic environments https://www.interact-roadautomation.eu/	✓
HEADSTART Harmonised European Solutions for Testing Automated Road Transport https://www.headstart-project.eu/	✓
BRAVE Bringing Gaps for the Adoption of Automated Vehicles https://www.brave-project.eu/	✓
RobustSENSE Reliable, Secure, Trustable Sensors for Automated Driving http://www.robustsense.eu/	✓
MAVEN Managing Automated Vehicles Enhances Network http://www.maven-its.eu/	✓
5G-CARMEN 5G for Connected and Automated Road Mobility in the European unioN https://5gcarmen.eu/	✓

Stakeholder	Stakeholder Forum
SecForCARS (GER) Security for Connected Automated Vehicles https://www.secforcars.de/	✓
MEC-View (GER) Mobile Edge Computing based Object Detection for Automated Driving http://www.mec-view.de/	✓
Socrates Paving the way for the future of car mobility https://socrates2.org/	✓
5G CroCo 5GCroCo: 5G Cross-Border Control http://5gcroco.eu/	✓
TransAid Transition Areas for Infrastructure-Assisted Driving https://www.transaid.eu/	✓
Transforming Transport https://transformingtransport.eu/	✓
vi-DAS Vision Inspired Driver Assistance Systems http://www.vi-das.eu/	✓
AVENUE The use of Autonomous Vehicles in public transport https://h2020-avenue.eu/	✓
FABULOS Future Automated Bus Urban Level Operation Systems https://fabulos.eu/	✓
Levitate (AUT) Societal Level Impacts of Connected and Automated Vehicles https://www.ait.ac.at/themen/transportshyoptimierung-logistik/projects/levitate/	✓
MANTRA (AUT) Making full use of Automation for National road Transport Authorities https://projekte.ffg.at/projekt/3041586	✓
STAPLE SiTE Automation Practical Learning http://stapleproject.eu/	✓
AVENUE 21 (AUT) Automated Mobility in cities http://avenue21.city/	✓
DIRIZON Advanced options for authorities in light of automation and Digitalisation horizon 2040 https://www.dirizon-cedr.com/	✓
MEC-View Mobile Edge Computing Based Object Detection for Automated Driving	✓

Stakeholder	Stakeholder Forum
http://www.mec-view.de/	
LUKAS Local environment model for cooperative, automated driving in complex traffic situations. https://www.uni-due.de/ptt/projekte/lukas.php	✓
Enable – S3 European Initiative to Enable Validation for Highly Automated Safe and Secure Systems https://www.enable-s3.eu/	✓
TrustVehicle Improved Trustworthiness and Weather-Independence of Conditionally Automated Vehicles in Mixed Traffic Scenarios https://www.trustvehicle.eu/	✓
WISE-ACT co-operation between a wide range of stakeholders at a local, national and international level http://www.wise-act.eu	✓
LEVITATE Societal Level Impacts of Connected and Automated Vehicles levitate-project.eu	✓
SUaaVE Investigate the factors behind public acceptability of CAV in a holistic way http://www.suaave.eu/	✓
SPROUT Concept of cities cooperating with the aim of building an appropriate response towards the urban mobility transition https://sprout-civitas.eu/	✓
5G IANA 5G for ITS https://www.5g-iana.eu/	✓
5G-LOGINNOV 5G for ITS https://5g-loginnov.eu/	✓
Infrastructure and road authorities (regional, national and European) Organizations (public or private) responsible for the correct management of road infrastructure	
POLIS Network Network of European cities and regions cooperating for innovative transport solutions https://www.polisnetwork.eu/	✓
BaSt German Federal Highway Research Institute http://bast.de/	✓

Stakeholder	Stakeholder Forum
ITF-OECD International Transport Forum at the Organisation for Economic Co-operation and Development https://www.itf-oecd.org/	✓
Greek Ministry of Infrastructure and Transport http://www.yme.gr/	✓
Greek Ministry of Telecommunications and Networks	✓
ERTRAC European Road Transport Research Advisory Council. https://www.ertrac.org	✓
BMVIT Austrian Federal Ministry of Transport, Innovation and Technology https://www.bmvit.gv.at/	✓
RWS Dutch Ministry of Infrastructure and the Environment http://www.rijkswaterstaat.nl/	✓
BMVI German Federal Ministry of Transport and Digital Infrastructure https://www.bmvi.de/	✓
DG Move The Commission's Directorate-General for Mobility and Transport responsible for EU policy on mobility and transport. https://ec.europa.eu/transport/home_en	✓
DG Connect The Directorate-General for Communications Networks, Content and Technology is the Commission department responsible to develop a digital single market to generate smart, sustainable and inclusive growth in Europe. https://ec.europa.eu/info/index_en	✓
RTD Directorate-General for Research and Innovation https://ec.europa.eu/info/departments/research-and-innovation	✓
NHTSA National Highway Traffic Safety Administration https://www.nhtsa.gov/	✓
ANSSI National Cybersecurity Agency of France https://www.ssi.gouv.fr/en/	✓
Standardisation bodies and technical committees	
CEN European Committee for Standardization https://www.cen.eu/	✓
3GPP The 3rd Generation Partnership Project uniting telecommunications standard development organisations https://www.3gpp.org/	✓

Stakeholder	Stakeholder Forum
OneM2M Standards for Machine 2 Machine and the Internet of Things http://www.onem2m.org/	✓
ISO - WG3 extended Vehicles International Organisation for Standardization https://www.iso.org/	✓
SAE International Global association in the aerospace, automotive and commercial-vehicle industries https://www.sae.org/	✓
UNECE Transport World Forum for Harmonization of Vehicle Regulations https://www.unece.org/	✓
TISA-TPEG Traveller Information services Association https://tisa.org/technologies/tpeg/	✓
IEC International Electrotechnical Commission. International Standards and Conformity Assessment for all electrical, electronic and related technolgies https://www.iec.ch/	✓
ETSI (signed LoS) European Standards Organisation https://etsi.org/	✓