5G4LIVES D6.4_COMMUNICATION, DISSEMINATION EXPLOITATION AND MARKET EXPLORATION, STANDARDISATION AND COMMUNITY BUILDING_1

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5G4LIVES

D6.4 COMMUNICATION, DISSEMINATION, EXPLOITATION AND MARKET EXPLORATION, STANDARDISATION AND COMMUNITI BUILDING_1

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REVISION TABLE

Version	Date	Comments
1.0	20/06/2024	First integration of contributions from VEFRESH, WIND TRE, MoT and PoT
1.1	25/06/2025	Final draft to be reviewed by Lead Partner

Disclaimer
The work described in this document has been conducted within the 5G4LIVES project.

5G4LIVES ABSTRACT

In an era where technology is advancing at an unprecedented pace, the project takes centre stage as an initiative committed to harnessing innovation for the greater good. This project unfolds its transformative vision across two distinct geographic clusters, Latvia and Italy. It strategically leverages 5G connectivity alongside cutting-edge technologies such as Unmanned Aerial Vehicles (UAVs or drones) and alternative hydrogen power. With a dual mission of enhancing public safety and environmental health, the project unfolds a narrative where data-driven forecasting and real-time aerial situational awareness become the bedrock of a more secure, efficient, and sustainable future.

At its core, the project seeks to enable optimal emergency management and data-driven forecasting, a mission encompassing the entirety of public safety. Through the dynamic fusion of 5G connectivity and UAVs, this initiative aims to provide real-time aerial situational awareness and automatic vulnerability assessment for at-risk areas. The project's scope extends beyond traditional rescue operations, pushing the boundaries of innovation to safeguard both human lives and the environment.

The project in Latvia involves using drones and 5G technology for monitoring and rescue operations, especially at Vecaku Beach and Kisezers Lake in Riga. This approach aims to enhance police efficiency, particularly in challenging terrains. In Turin, the focus is on developing a 5G-enabled service for situational awareness and vulnerability assessment to counter natural disaster threats. This includes testing anti-drone hacking technology, integrating satellite data, and improving pilot-drone command for better emergency response. The project also includes research in Riga on safety protocols and procedures for urban drone operations and beyond-visual-line-of-sight (BVLOS) flight methodologies with EU-wide relevance. A significant aspect of the project is to engage in extensive communication to inform and educate local, national, and EU networks about these technological solutions.

By leveraging 5G and drones, the project promises quicker and more effective emergency response, addressing staff shortages in law enforcement and expanding their skill set. In Latvia, the use of drones and 5G connectivity will empower law enforcement to intervene more swiftly, addressing staff shortages and expanding the skill set of police officers. In Italy, the project will mitigate the threat of natural disasters and test innovative anti-drone hacking technologies, leading to more efficient emergency responses. Additionally, developing safety protocols and procedures for urban drone flights and validating BVLOS flight methodologies will set new standards for public safety and security. The project emphasises community involvement and knowledge sharing, ensuring that the benefits of these technological advancements extend beyond immediate emergency management to foster a more resilient and informed society.

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ABBREVIATIONS AND ACRONYMS

BVLO	Behind Visual Line of Sight
EASA	European Union Aviation Safety Agency
SORA	Specific Operations Risk Assessment
EU	European Union
MS	Microsoft
UAV	Unmanned Aerial Vehicle
NOTAM	Notice to Airmen
FAA	Federal Aviation Administration
UAS	Unmanned Aerial System
WP	Work Package

EXECUTIVE SUMMARY

The present deliverable D6.4 outlines the comprehensive activities undertaken by the 5G4LIVES project during its first 18 months in the domains of communication, dissemination, exploitation, market exploration, standardisation, and community building. It reflects how the project has strategically amplified its visibility, promoted stakeholder engagement, and prepared the groundwork for wider impact through capacity-building and policy alignment.

Throughout this period, the project successfully launched a coherent and recognisable branding strategy, which was applied across all media and communication formats. A multilingual website was developed and integrated within the Riga City Council's online infrastructure, accumulating over 18,000 sessions, three times the original KPI. Over 40 high-quality social media posts, newsletters, scientific papers, press releases, and project videos significantly expanded the project's reach, visibility, and credibility.

5G4LIVES also participated in major European conferences and hosted its stakeholder-focused events, including the Midterm Meeting and General Assembly in Riga and Torino, respectively. These events catalysed cross-sector dialogue, showcased use cases, and promoted technological innovation aligned with 5G-enabled emergency and environmental monitoring solutions.

Community building was addressed through targeted Training Packages, collaborative workshops (notably with CITYAM and IPROMO), and strategic participation in innovation procurement seminars. A strong emphasis was placed on upskilling public authorities, supporting innovation in public procurement, and involving the broader public in technology adoption.

The exploitation and market exploration strategy advanced significantly, with both Latvian and Italian clusters outlining strategic paths forward. LMT (Latvia) developed a methodological framework and business model for scalable BVLOS services. At the same time, Windtre (Italy) positioned itself as a provider of 5G-enabled public safety services, proposing a dedicated 5G slice and "Emergency & Environmental Response-as-a-Service" business offer.

From a regulatory and innovation perspective, the project laid foundational work for standardisation through its BVLOS methodology and alignment with EASA's SORA framework, supporting a potential EU-wide replication. Intellectual property results and innovative software platforms are under consideration for patenting and commercialisation.

In summary, the 5G4LIVES project has delivered a high-performing first half marked by impactful communication, targeted stakeholder engagement, demonstrable technical progress, and promising commercial pathways. The next phase will deepen impact through training rollout, demonstrator showcases, and replication across European smart communities.

INTRODUCTION

The 5G4LIVES project leverages 5G connectivity and drone technology to improve public safety and environmental monitoring in Riga and Turin. To support its mission, Work Package 6 focused on a comprehensive communication, dissemination, and community-building strategy. This included developing unified branding, establishing an online presence, sharing scientific insights, and organising workshops, events, and training sessions. The project's communication approach has been inclusive, targeting a wide range of stakeholders from policymakers to the public, thereby raising awareness of the project's societal relevance and technological innovation.

1. 5G4LIVES COMMUNICATION AND DISSEMINATION ACTIVITIES

1.1 PROJECT BRANDING

As detailed in Deliverable D6.1 (Communication and Dissemination Plan), the 5G4LIVES project developed and implemented a consistent and recognisable visual identity from the early stages of the project to ensure coherent communication across all dissemination activities. The branding aimed to reinforce the project's visibility, build stakeholder recognition, and support professional and impactful engagement with audiences. VEFRESH led the branding work, responsible for Work Package 6 (WP6), which focuses on dissemination, communication, and exploitation.

The visual identity of 5G4LIVES includes a project logo, colour palette, key visuals, and standardized templates for social media, Word documents, PowerPoint presentations, and other dissemination materials. The logo incorporates symbolic design elements that reflect the project's focus areas—namely air (light blue), water (dark blue), and mountainous terrain (graphite grey)—each corresponding to the operational environments in Riga and Turin. This thematic representation was carefully considered to align the visual identity with the real-world settings where 5G4LIVES use cases are being deployed, such as Vecāķi Beach and Ķīšezers Lake in Latvia and the Turin Hills in Italy (for detailed project visual identity design, please see Deliverable 6.1).

Figure 1. 5G4LIVES Project logos

Figure 2. 5G4LIVES Project colours

Figure 3. EU Funding statement

Figure 4. 5G4LIVES key visual
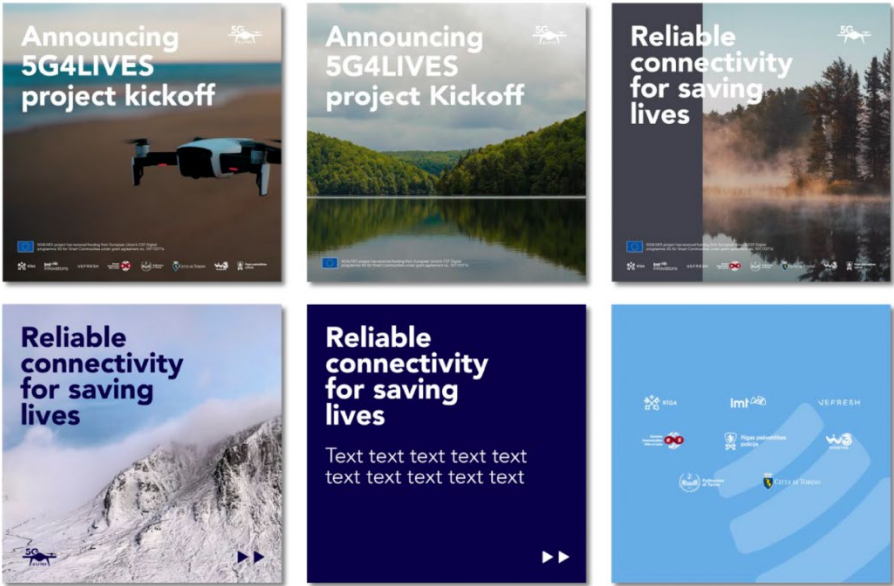
Figure 5. Social media post templates

The project branding was widely applied throughout the first 18 months in both digital and physical formats. Social media content used by partners was built upon a set of professionally designed templates, which included mandatory branding elements: the 5G4LIVES logo, the EU funding acknowledgement and flag, and visual cues reflecting drones, emergency response, and technological innovation. These templates were distributed via the shared MS Teams workspace, ensuring all partners could easily access, localise, and use

them. To preserve message consistency, partners were encouraged to adapt visual formats to suit their institutional branding while keeping the core message, branding, and hashtags (#5G4LIVES) intact.

In the absence of designated project-specific social media accounts during the initial project phase, communication activities were carried out through the established social media platforms of consortium partners. This approach, as foreseen in D6.1, maximised the organic reach of each post by leveraging the existing follower bases of well-established institutional and personal accounts. The branding thus played a critical role in creating visual unity across decentralised communication channels.

Additional branding applications included printed materials (such as roll-ups and leaflets used at events and conferences), newsletters, press releases, and videos. All materials followed the guidelines laid out in D6.1 to ensure high-quality, aligned visual communication. The official website of the 5G4LIVES project, hosted on the Riga City Council's site, also reflects this unified branding and acts as a central repository for up-to-date project information.

Overall, the branding strategy implemented during the first 18 months has provided a strong and consistent identity for the 5G4LIVES project, supporting its dissemination goals and enhancing its recognisability among stakeholders, media, and the public. Moving forward, these visual and narrative tools will continue to play an essential role in reinforcing the project's message, particularly as more demonstrators, results, and replication opportunities are communicated in the latter phases of the project.

1.2 COMMUNICATION CHANNELS

Website

The 5G4LIVES website has been built under the Riga City Council's website and can be found via this link (available in both Latvian and English):

Figure 6. 5G4LIVES official website

To enhance traffic, website content is constantly updated with fresh information provided by all consortium partners, covering topics such as novelties in drone and/or 5G technologies, discoveries, research results, technology, etc.

The initial goal for the project's entire lifespan aims to achieve 6000 sessions on the project's websites; activity until 30.06.2025: 18629 sessions. The website has been active for 18 months. Project partners are encouraged to promote the 5G4LIVES website link on their respective websites, newsletters, and social media platforms to increase traffic.

Social media

During the first 18 months of the 5G4LIVES project, social media communication activities were carried out through the social media platforms of project partners and individual contributors. These efforts focused on sharing project news, milestones, and event highlights across various audiences.

The platforms used by partners and individual contributors were primarily LinkedIn and Facebook, with occasional posts shared on X (formerly Twitter) and Instagram. LinkedIn accounts were primarily used to engage a more technical and professional audience, while Facebook served to reach broader, non-technical stakeholders through accessible and informative posts. During project events, VEFRESH provided real-time social media coverage to amplify visibility and encourage online engagement. The number of total social media posts by June 30, 2025, is 42.

Figure 7. 5G4LIVES project launch announcement on Riga City Council Facebook page

Posts emphasised partner involvement, showcased scientific outputs such as publications and presentations, and promoted engagement in project-related events, conferences, workshops and demonstrations.
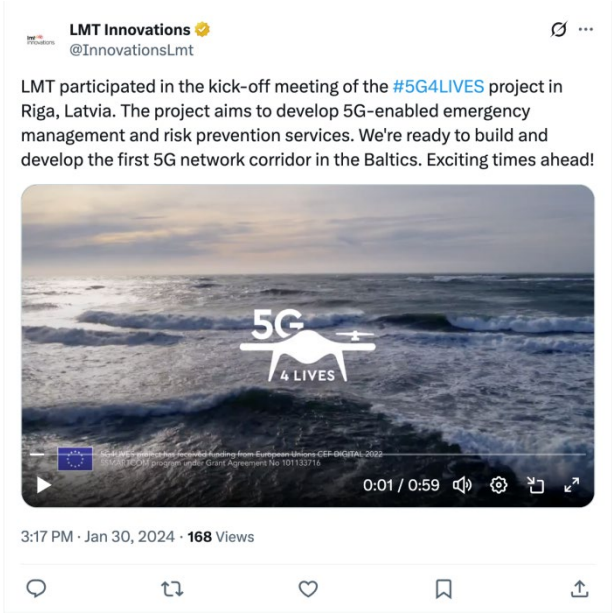
Figure 8. 5G4LIVES kick-off video on LMT Innovations ''X'' platform page
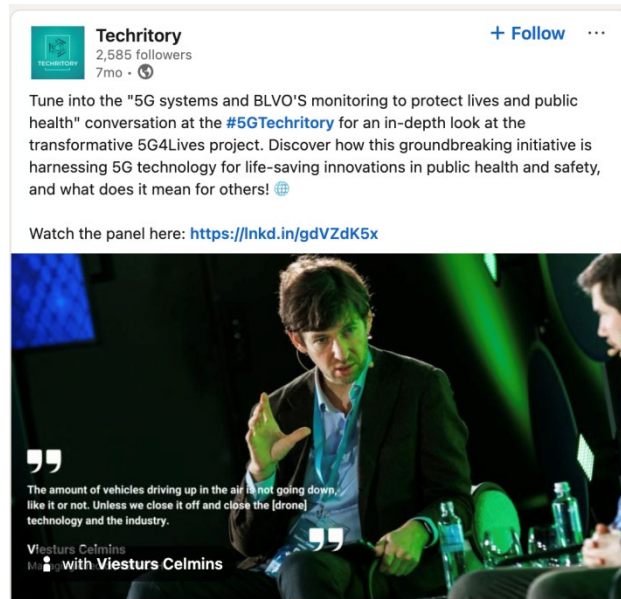
Figure 9. 5G4LIVES project participation at the 5G Techritory Conference on 5G Techritory's (Elektroniskie sakari administered) LinkedIn page

To support a consistent and structured dissemination approach, VEFRESH has been responsible for creating social media content — including textual updates, visuals, and editable assets (e.g., .ai files) — and distributing it via the designated 5G4LIVES MS Teams space. This ensured that all partners could easily reshare or adapt the content by their branding guidelines while maintaining message visual and messaging integrity. All posts were required to include the hashtag #5G4LIVES and tag all project partners and relevant EU bodies.
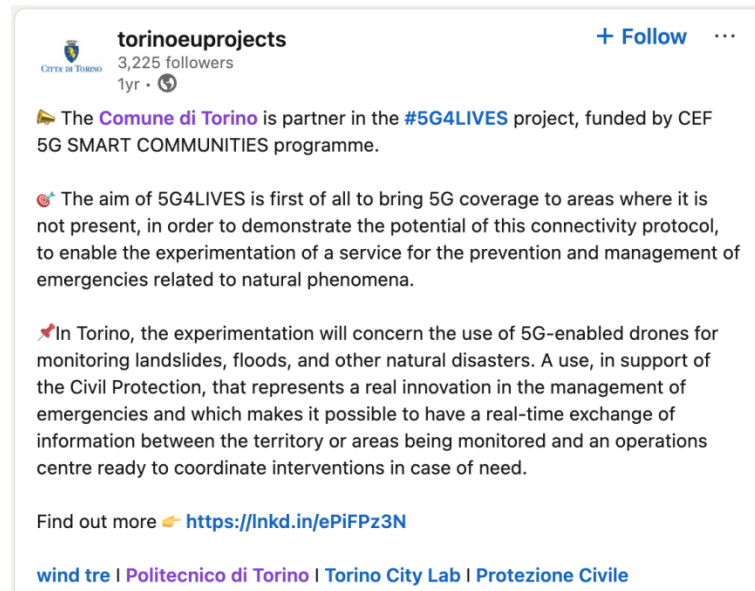
Figure 10. 5G4LIVES project announcement post by Comune di Torino on LinkedIn

As of Month 16, a dedicated 5G4LIVES LinkedIn page has been launched and serves as the primary platform for current and future project dissemination: https://www.linkedin.com/showcase/5g4lives. This transition enables centralised, consistent communication and brand visibility across the project's remaining lifecycle. All partners remain responsible for informing the WP6 lead (VEFRESH) of any independently shared 5G4LIVES-related content to ensure alignment and coordinated tracking of outreach activities.
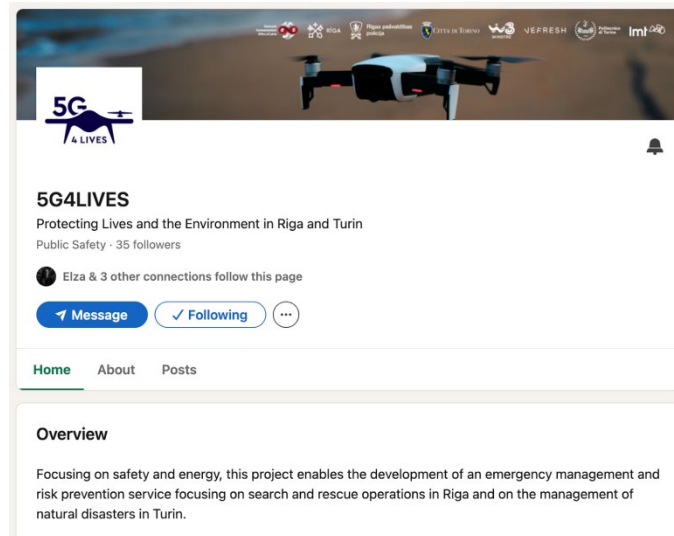
Figure 11. 5G4LIVES LinkedIn page

<u>Press releases</u>

Press releases have played an important role in raising public awareness about the 5G4LIVES project. These releases were primarily aimed at the public, media outlets, and local stakeholders, serving to announce major milestones, events, and project achievements in a clear and accessible manner.

Press releases were written and published by VEFRESH and other project partners. Content was aligned with the overall communication plan and ensured consistent messaging, adherence to branding guidelines, and visibility of EU support. In many cases, local partners adapted the releases for national or regional media to maximise outreach in Latvia and Italy. Topics included project kick-off announcements, demonstration activities, local events, and appearances at major conferences.

All press releases were published in both English and local languages (Latvian and Italian) where relevant and were disseminated via partner websites, social media platforms, and press channels. These efforts contributed to increased visibility of the project's societal value and helped establish 5G4LIVES as a credible, forward-looking initiative in the field of 5G-enabled public safety.

Press releases have appeared in the media a total of 8 times. Below is a summary of key press releases published during the reporting period:

- The press release "Rīga kopā ar Turīnu testēs dronu tehnoloģijas pašvaldības policijas operatīvajā darbā", published on the official Riga City website, announces the launch of a joint drone technology pilot between Riga and Turin under the EU-funded 5G4LIVES project. Presented during a two-day seminar at Riga City Council on 29–30 January 2024, the initiative focuses on integrating drones with thermal and infrared cameras into municipal police operations. Supported by 5G infrastructure and hydrogen-powered charging units, the pilot aims to enable Beyond Visual Line of Sight (BVLOS) missions and enhance emergency response through smart, data-driven tools.
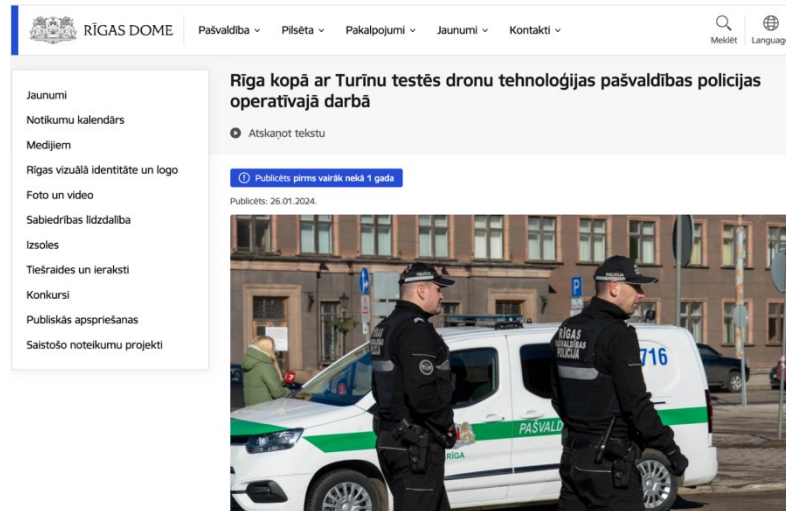
Figure 12. 5G4LIVES announcement press release on the Riga City Council website

- The press release "Riga Municipal Police will start introducing automated drone flights", published on the official Riga City website, outlines Riga's next steps under the EU-funded 5G4LIVES initiative. It explains that four drones, equipped with thermal and infrared cameras, will be deployed at Vecāķi and Ķīšezers beaches to conduct long-duration, automated patrols. These drones aim to enhance public safety and environmental monitoring—such as search-and-rescue, ice and poaching control, and pollution detection—while easing the workload of police operators by enabling Beyond Visual Line of Sight (BVLOS) and real-time data transmission over 5G networks.
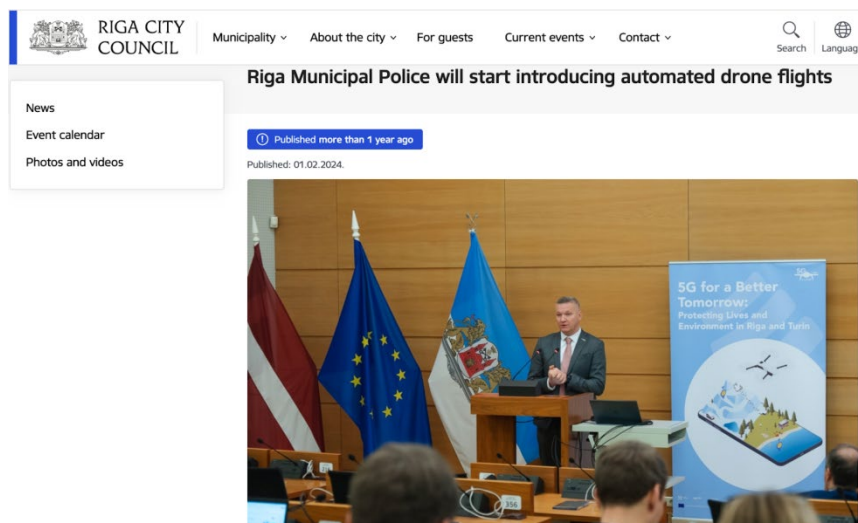
Figure 13. 5G4LIVES project press release on the Riga City Council website

- The press release "29–31 gennaio 2024: Kick-off meeting del progetto 5G4LIVES", published on the Comune di Torino – Relazioni Internazionali website, reports on the official kick-off event held in Turin at the end of January 2024. The meeting launched the EU-funded 5G4LIVES project, focusing on deploying drones and 5G connectivity to support public safety and environmental protection. Participants discussed real-time situational awareness, drone flight protocols, BVLOS missions, integration of satellite and anti-drone safety systems, and the development of comprehensive operational protocols—all aimed at improving situational control during emergencies and safeguarding communities in both Torino and Riga.

Figure 14. 5G4LIVES announcement press release on the Comune di Torino website

Interviews, newsletters

Newsletters are a key tool in the 5G4LIVES dissemination strategy, aimed at keeping stakeholders, collaborators, and the public informed about the project's progress, milestones, and upcoming activities. As outlined in the communication plan (D6.1), a total of six newsletters are planned over the course of the project.

The first 5G4LIVES newsletter is scheduled to launch in the first week of July 2025 and provides a comprehensive overview of the project and a summary of the progress achieved during the first 18 months. It highlights use case development in Latvia and Italy, key technical milestones, event participation, and partner contributions. The newsletter is distributed through partner mailing lists, partners' social media channels, and the project's online platforms to ensure broad visibility.

Looking forward, newsletters will be published more frequently to align with project milestones, events, and demonstrator outcomes. Each issue will continue to present project updates in a visually engaging and accessible format, including short articles, partner spotlights, and links to external resources such as scientific publications and videos.

Newsletters schedule:
- Newsletter 1: July 2025 (project progress in the first project period)
- Newsletter 2 - October 2025 (Training Package 1 dissemination; Demonstrations in Riga; events of project participation)
- Newsletter 3 - January 2026 (Summary of project progress in 2025)
- Newsletter 4 - April 2026 (Training Package 2 dissemination)
- Newsletter 5 - September 2026 (Demonstrations in Torino; Project progress in 2026)
- Newsletter 6 - December 2026 (Summary of project achievements in 2026 + conclusions)

In addition to written communication tools, interviews have served as an effective format for sharing in-depth insights into 5G4LIVES activities, technologies, and the perspectives of project partners. These interviews have helped to personalise the project and make its complex topics more relatable to broader audiences, including policymakers, industry stakeholders, and citizens.

The following interviews were conducted and published during the first 18 months:
- Latvia Radio 1 (Latvijas Radio 1) interview, about the launch of the 5G4LIVES project. Riga Municipal Police Deputy Chief Andrejs Aronovs about the main goals of the 5G4LIVES project. 29 January 2024.
- In an interview with *Forbes Italia*, WindTre's Corporate Marketing Director Luca Cardone highlighted the main goals of the 5G4LIVES project in Turin: using 5G-connected drones to support public safety and environmental protection, including wildfire detection, search and rescue, and pollution monitoring, helping authorities respond faster and more effectively. 31 January 2025.

- [In an interview during the talk show ''Kas notiek Latvijā?](#)'', project coordinator Laila Zemīte (Riga City, Riga Municipal Police will start introducing automated systems regarding climate neutrality and green course in Latvia. 8 November, 2024.

Figure 15. Laila Zemīte during the ''Kas notiek Latvijā?'' talk show.

Additional interviews are planned in the coming phases of the project, with a focus on highlighting use case leads, technical innovations, and the real-world impact of 5G4LIVES on emergency services and environmental monitoring.

1.3 PROMOTIONAL MATERIALS

To support visibility and stakeholder engagement, 5G4LIVES has produced a set of high-quality promotional materials designed to communicate the project's core objectives, use cases, and expected impact. These materials include printed leaflets and roll-up banners, tailored for use at public events, conferences, and stakeholder meetings.

A total of 800 leaflets have been printed and are actively distributed during events, workshops, and exhibitions across Latvia, Italy, and at international conferences. These leaflets provide a concise and visually appealing overview of the project's mission, use case environments, partner network, and technological innovations. The design incorporates compelling visuals, clear structure, and key messaging aligned with the project's branding strategy.

In addition, three project roll-up banners - in Italy and Latvia - are in active use to enhance the visibility of the 5G4LIVES booth or presence at events. These banners reinforce the project's identity and serve as visual anchors during live interactions, presentations, and exhibitions.

Figure 16. (upper) 5G4LIVES project leaflets, (below) 5G4LIVES roll-up banners

For dissemination on social media, as well as visual information on screens during various congresses, summits and conferences, two project videos have been developed so far: a project kick-off video, as well as video coverage of the project's panel at Smart City Expo 2024.

The project kick-off video is available here:
https://www.linkedin.com/posts/vefreshmovement_5g4lives-activity-7160214626859728896-GHtC?utm_source=share&utm_medium=member_desktop&rcm=ACoAAD9VkRoBD7mXcg1uRl5ZERuD5PxCQiccG9w

Video coverage of the project's panel at Smart City Expo 2024 is available here:
https://www.linkedin.com/feed/update/urn:li:activity:7273347477959757825

1.4 PARTICIPATION IN CONFERENCES

During the first 18 months, the 5G4LIVES project took part in high-level conferences to promote project visibility and share insights with relevant stakeholders from the 5G, UAV, and public safety sectors:

- **ICUAS 2024 & ICUAS 2025 – International Conference on Unmanned Aircraft Systems**. A paper highlighting UAV use cases and technical findings from the project, including the use of 5G for real-time situational awareness and data transmission in emergency scenarios.
- **Connect University: 5G Deployment – An Expert's Perspective (June 11, 2024, online)**. Inga Barisa, Adviser of Riga City Council Digital Agency, participated in a European Commission-led session to present 5G4LIVES use cases and highlight how 5G connectivity supports drone-based emergency and environmental operations. The session facilitated exchange between EU policymakers, researchers, and industry stakeholders.
- **Smart Cities Conference 2024 (September 19, 2024)**. Project partners from RCC and VEFRESH participated in a panel discussion on the practical applications and regulatory challenges of integrating drones into urban transport systems.
- **RTUCON 2024 – Riga Technical University 65th International Scientific Conference (October 11, 2024)**. Ilona Platonova from RCC presented 5G4LIVES progress and use case deployment in Riga, focusing on 5G integration into UAV systems and its benefits for emergency response and real-time data monitoring.
- **5G Techritory 2024 (October 31, 2024)**. Project partners from RCC, LMT, and VEFRESH participated in a discussion panel to discuss how the 5G4LIVES project strategically combines 5G connectivity with cutting-edge technologies, such as enabling monitoring of drones.
- **Droni e Mobilità Aerea Avanzata – Osservatori Politecnico di Milano (February 25, 2025, Milan, Italy)**. The Municipality of Turin presented 5G4LIVES activities related to UAV deployment in public safety contexts, focusing on the integration of drones into urban environments, operational lessons, and regulatory challenges in the Italian context.

1.5 SCIENTIFIC PUBLICATIONS

Scientific dissemination is a key component of the 5G4LIVES communication strategy, targeting the academic and research community to share technical results and foster collaboration on UAV and 5G-related topics. During the first 18 months of the project, three scientific publications have been produced and presented at relevant international conferences, contributing to the project's visibility in the research landscape.

- **"Harnessing 5G Connectivity and UAVs for Enhanced Public Safety"**
  Presented at RTUCON 2024
  Authors: Laila Zemīte, Ilona Platonova, Evija Plone, Vladimirs Petrovs, Stefano Primatesta
  PDF link – RTUCON2024 paper

- "A 2.5D Risk-Aware Path Planning Method for Safe UAS Operations in Populated Environments"
  Presented at ICUAS 2024
  Author: Stefano Primatesta
  PDF link – ICUAS 2024 paper

- "A Risk-Aware Mission Planning and Monitoring Methodology for UAS Operations"
  Presented at ICUAS 2025
  Author: Stefano Primatesta
  PDF link – ICUAS2025 paper

- "Experimental Study on LTE Mobile Network Performance Parameters for Controlled Drone Flights"
  Published in Sensors 2024
  Authors: Jānis Braunfelds, Gints Jakovels, Ints Murans, Anna Litvinenko, Uģis Senkans, Rūdolfs Rumba, Andis Onzuls, Guntis Valters, Elīna Lidere, Evija Plone
  Link to paper

1.6 PROJECT EVENTS

5G4LIVES has organised and participated in several dedicated project events, such as collaborative workshops, to support stakeholder engagement, facilitate knowledge exchange, and promote the project's use cases and technological progress. These events have provided essential platforms for internal coordination, public dissemination, and cross-sectoral collaboration.

The project kick-off meeting, held on 29 January 2024 in Riga, brought together all consortium partners to align on objectives, work plan timelines, and communication workflows. It set the foundation for the collaborative structure and helped define the initial implementation steps for the Riga and Turin use cases.

Figure 17. 5G4LIVES project kick-off meeting

The 5G4LIVES Annual General Assembly took place in Torino from January 15–17, 2025, bringing together project partners and external stakeholders. The event began with a partners' meeting focused on reviewing progress and setting future goals across all work packages (WP1–WP6). The second day featured a stakeholder workshop and public webinar, with presentations and panel discussions on innovative urban use cases powered by 5G and beyond networks. Notable contributors included the Links Foundation, ABzero, Leonardo, Reply, and the Piedmont Region, covering topics like drone-based organ transport, smart mobility, and urban regulatory frameworks. The third day concluded with a study visit to the Civil Protection Control Room in Torino.
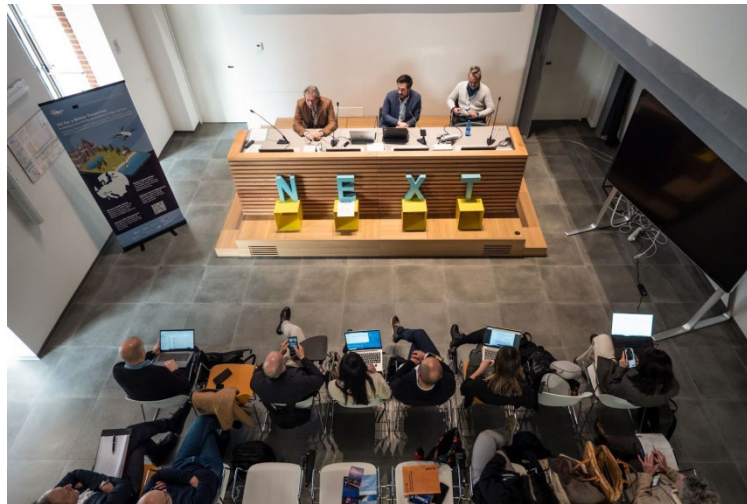
Figure 18. 5G4LIVES Annual General Assembly

The 5G4LIVES Midterm Meeting took place on June 10, 2025, in Riga, gathering project partners to review achievements from the first half of the project and to outline the goals, challenges, and strategic plans for the remaining 18 months. The agenda included partner presentations summarising work package progress and deliverables, followed by an interactive afternoon workshop. This hands-on session used a problem-solving methodology where participants collaboratively built scenarios using LEGO bricks on a map, encouraging engagement, creativity, and joint planning for future activities.

Figure 19. (upper) 5G4LIVES Midterm meeting, (below) 5G4LIVES Midterm meeting workshop

5G4LIVES representatives from Riga participated in multiple collaborative workshops with other projects, notably IPROMO (organised by VEFRESH and Riga Digital Agency):

- <u>1st Workshop – Defining the Object of Innovation Procurement (3 July 2024, Riga)</u>
  July 3, 2024. Focused on defining the object of innovation procurement. Expert Rikesh Shah (Catapult London) shared insights from international practice, highlighting the role of public procurement in driving innovation and the importance of early market engagement, experimentation, and flexible procedures. Participants discussed the challenges faced in Latvia—such as low competence, limited funding, and procedural complexity—and identified the need for clearer guidelines, financial incentives, and capacity building to promote innovation through public procurement.
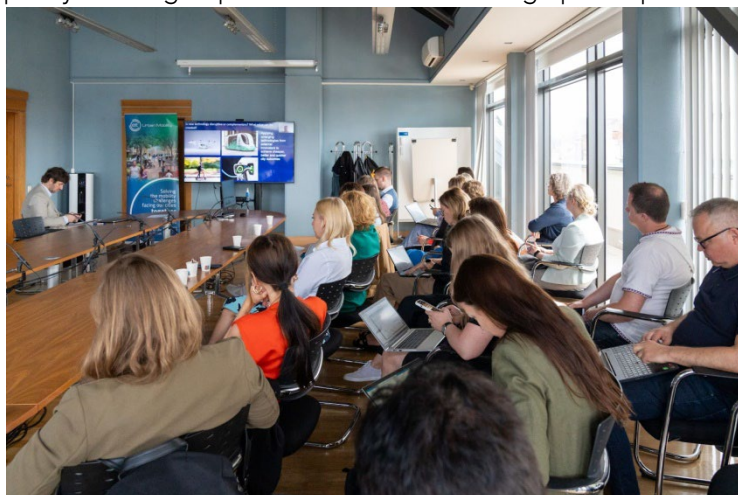
Figure 20. 5G4LIVES and IPROMO 1st collaborative Workshop

- <u>2nd Workshop – Risk Management in Innovation Procurement (3 October 2024, Riga)</u>
  October 3, 2024. Explored how to manage risks within innovation procurement, featuring legal expert Mateusz Stańczyk (SMM Legal). Participants gained practical knowledge about PCP, PPI, and Innovation Partnerships, learning that major risks stem from weak leadership, misaligned expectations, and supplier overpromising. The workshop emphasised the need for early expert involvement, clear evaluation criteria, supplier oversight, and structural support—such as risk-sharing mechanisms and phased payments—to manage complex, high-risk innovation procurements successfully.

Figure 21. 5G4LIVES and IPROMO 2nd collaborative Workshop

- <u>3rd Workshop – Theory and Practice of Innovation Procurement (5 December 2024, Riga)</u>
  December 5, 2024. A hands-on look at how innovation procurement works in practice, led by Lars Fabricius from Trøndelag County Authority. The session focused on the PPI model, stressing the importance of trust in suppliers, functional rather than technical specifications, and a flexible, phased approach to procurement planning. A case study on hybrid-electric ferries in Norway illustrated how municipalities can steer industry innovation through strategic procurement. Latvian participants highlighted challenges like inflexible timelines and low risk tolerance, calling for practical guidelines, early-stage funding, and capacity-building measures.

Figure 22. 5G4LIVES and IPROMO 3rd collaborative Workshop

All events were supported by branded materials, social media coverage, and photography to enhance visibility and document the project's outreach efforts. These activities also contributed content for press releases and conference presentations, reinforcing the role of events in the broader dissemination strategy.

As the project progresses, additional events are planned to showcase demonstration results and engage key stakeholders in discussions around the project's topics.

1.7 TARGET AUDIENCES

Throughout the first 18 months of the 5G4LIVES project, dissemination and communication activities were designed to address the specific needs, interests, and levels of technical understanding of several key target groups. The following audience segments were prioritised:

Industry stakeholders:
- Drone manufacturers, telecom operators, and service providers.
- Aim: Promote technical results and use case relevance for potential adopters.
- Channels: LinkedIn, industry events, newsletters, webinars.

Industry stakeholders were reached via technical panels, webinars, and LinkedIn campaigns. Notably, the project was featured at major industry events such as the Smart City Expo World Congress, 5G Techritory, and the Drone Summit 2025, where use cases were presented to drone manufacturers, telecom providers, and mobility solution developers. A total of 42 social media posts related to project activities were shared via partner channels, primarily on LinkedIn, reaching thousands of professional stakeholders.

Public authorities & policymakers:
- Ministries, city councils, and aviation regulators.
- Aim: Inform policy and regulatory development for UAV and 5G integration.
- Channels: Workshops, reports, conferences, newsletters.

The target group was engaged through workshops and panel discussions such as the Innovation Procurement Workshop Series (IPROMO) and participation in events like the Open & Agile Smart Cities Digitalisation Forum and Smart Skies Seminar. Over 50 public sector participants attended workshops, and the project received coverage in local government and EU-level discussions on digital transformation and regulation.

General public:
- Non-specialist citizens, especially in demonstration areas.
- Aim: Raise awareness of the benefits of safety, environment, and innovation.

- Channels: Facebook, press releases, videos, website.

The public was informed through Facebook posts, press releases, and videos, including the project kick-off video and Smart City Expo coverage, shared on social media and partner websites. The distribution of 800 printed leaflets complemented these efforts and will be further developed with real-time social media updates from demonstration events, such as those at Vecāķi and Ķīšezers Beach and Turin hillside.

Scientific & academic community:
- Universities, research centres, and technical networks.
- Aim: Share findings and encourage replication or follow-up research.
- Channels: Publications, conferences, and academic workshops.

Scientific and academic communities were addressed via three peer-reviewed publications, presented at RTUCON, ICUAS 2024, and ICUAS 2025. Project representatives gave lectures and presented papers on UAS risk-aware planning and 5G integration, stimulating academic dialogue and future collaboration.

Project partners & collaborators:
- Consortium members and stakeholders.
- Aim: Ensure message consistency, promote joint visibility.
- Channels: MS Teams, shared templates, internal coordination.

Consortium members and collaborators benefited from an internal newsletter, over 20 coordination meetings, and the use of shared visual assets via MS Teams. The mid-term meeting in Riga (June 2025) and the general assembly in Torino (January 2025) enabled structured stakeholder exchange and facilitated the co-creation of dissemination materials and training content.

To monitor effectiveness, dissemination metrics are tracked in a shared Excel dashboard (5G4LIVES Dissemination, Exploitation and Standardisation Activities.xlsx), covering post counts, participation data, press coverage, and outreach performance. As of M18, the project achieved:
- 42 social media posts,
- 18629 website sessions,
- 1 newsletter released,
- 2 webinars held,
- 4 scientific publications,
- Participation in 6+ international events.

Each of these target groups was addressed with tailored messaging, frequency, and content formats. Communication intensity and content depth were adjusted according to the audience's background—technical, policy-oriented, or public-facing. This strategic approach contributed to the effective dissemination of project updates, use case progress, and broader project impact in both Latvia and Italy.

1.8 MONITORING OF COMMUNICATION AND DISSEMINATION ACTIVITIES

5G4LIVES project implements a structured and ongoing monitoring process to track the effectiveness and reach of its communication and dissemination activities. This process ensures that outreach efforts are aligned with the project's strategic goals, key messages, and target audiences. The WP6 lead, VEFRESH, is responsible for collecting, reviewing, and updating records of all dissemination actions carried out by consortium partners. These activities and achieved results are represented in the 5G4LIVES project's communication and dissemination Excel file on the project's MS Teams platform: https://docs.google.com/spreadsheets/d/1HROm5s56tZqj22GzcxyVzG_VyCzhmvvO/edit?usp=sharing&ouid=110658408392826754750&rtpof=true&sd=true

Activities are documented through regular reporting and consolidated in shared tracking tools, allowing the consortium to evaluate performance across channels such as social media, newsletters, press releases, scientific publications, event participation, and stakeholder engagement. Key metrics—such as publication dates, platforms used, audience reach, and partner involvement—are reviewed periodically to identify opportunities for improvement and ensure visibility requirements are met.

1.9 KEY PERFORMANCE INDICATORS

Table 1. Communication and Dissemination KPIs

KPI	Count (stated in D6.2)	Actual (by the end of RP1)	Description
Papers in journals/magazines	1	3	See 1.5 above
Participation in conferences	3	6	See 1.4 above
Participation in fairs	3	2	Smart City World Expo Congress 2024, Barcelona ITS Europe 2025, Seville
Presentations in relevant sectoral events	6	4	Drone Summit 2025, 27 May 2025 "Drone data collecting and processing - use cases in Latvia" seminar, Valmiermuiža, Latvia, 12 February 2025 Eurocities Network Mobility Forum 2025, Riga, Latvia, 19 March 2025 OASC Digitalisation Awareness Forum 2025, Riga, Latvia, 15 April 2025
Newsletters	6	1	First 5G4LIVES newsletter launched on __ June
Webinars	2	2	Annual General Assembly in Torino Mid-term meeting in Riga
Stakeholder Workshops	2	2	Torino Annual General Assembly Stakeholder workshop, January 16, 2025 Riga Mid-term meeting Stakeholder workshop, June 10, 2025
Participants in Stakeholder Workshops	50	52	36 participants in the Torino workshop 16 participants in the Riga workshop
Media publications (press releases, articles, etc.)	4	16	See the 5G4LIVES project's communication and dissemination Excel file
TV, radio appearances	>3	6	See the 5G4LIVES project's communication and dissemination Excel file
Website sessions	6000	18 629	See the 5G4LIVES project's communication and dissemination Excel file
Social media posts combined from all partners' social media channels	At least >30	42	See the 5G4LIVES project's communication and dissemination Excel file

People reached with social media content	500 000	60 106	See the 5G4LIVES project's communication and dissemination Excel file
Project Video	6	2	5G4LIVES project Kick-off video Video coverage of the project's panel at Smart City Expo 2024

2. 5G4LIVES COMMUNITY BUILDING

2.1 TRAINING AND CAPACITY BUILDING

As part of the 5G4LIVES project, a dedicated **Training Package (TP)** is being developed to support training and learning activities across the different use cases during the deployment and evaluation phases. The TP is structured to integrate content provided by all WP2-WP6, which will be customised and contextualised based on the needs of each specific use case. The first release of the Training Package is planned for Month 18, while the second part and final version will be issued by Month 32, incorporating insights and lessons learned from the implementation phase.

The Training Package 1 consists of four core modules: (1) *Foundations of 5G4LIVES and Emergency Response Innovation*, introducing key concepts such as 5G and the role of drones in public safety; (2) *Building the System – Technology and Operations*, covering BVLOS flights, mission planning, and cybersecurity; (3) *Real-world Deployment and Measurable Impact*, focusing on live demonstrations, performance metrics, and societal benefits; and (4) *Strategic Outlook and Policy Considerations*, addressing legal, ethical, and replication aspects.
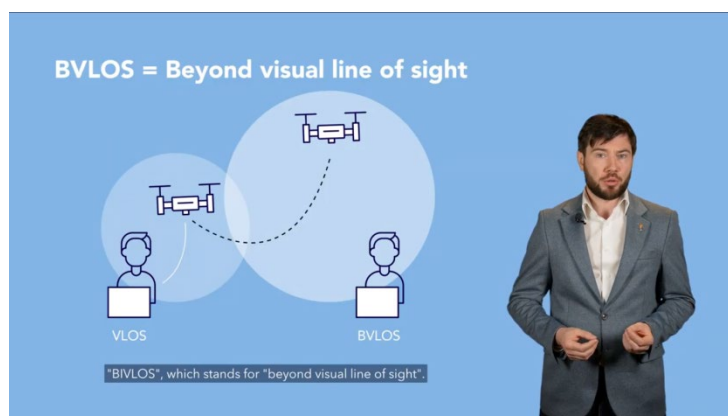
Figure 23. screenshot from 5G4LIVES Training package

Training Package 1 will be hosted on a dedicated YouTube platform, where a total of 19 videos will be available in modules, as well as presentations and Speech to Text available for download. More information on TP1 development, content of modules, each video, design and other details is available in D5.1.

2.2 COLLABORATION WITH OTHER PROJECTS AND INITIATIVES

The 5G4LIVES project has established a strong and lasting collaboration with the CITYAM project (*Preparing Cities for Sustainable Urban Air Mobility*), which focuses on helping cities integrate Urban Air Mobility solutions in a sustainable and citizen-oriented way. This partnership was prominently showcased during a joint high-level panel at the **Smart City Expo World Congress (SCEWC)** in Barcelona, held at the Nordic-Baltic Pavilion. The session, *"Urban Air Mobility by 5G Solutions: Accelerating Drone Services"*, featured insights from both projects and highlighted how 5G infrastructure can enable safe, efficient, and scalable drone services in urban environments. This collaboration continues to enrich both projects by aligning technological innovation with practical urban needs and policy insights.

Figure 24. 5G4LIVES and CITYAM representatives during the panel session at the SCEWC 2024

The 5G4LIVES project has actively engaged with the **IPROMO** project, co-funded by EIT—an innovation procurement capacity-building programme led by VEFRESH and Riga Digital Agency—through a series of collaborative workshops held in 2024. These sessions explored critical aspects of innovation procurement, including defining procurement objectives, managing legal and strategic risks, and applying procurement models in practice. International experts shared best practices and real-world case studies, helping Latvian stakeholders identify key barriers such as limited funding, procedural complexity, and risk aversion. The collaboration with IPROMO has provided valuable insights for 5G4LIVES, especially in shaping sustainable and innovative procurement strategies for deploying next-generation drone and 5G solutions.

Figure 25. 5G4LIVES and IPROMO collaborative Workshop

The **5G4LIVES** project also fostered knowledge exchange and cross-sector collaboration through the Day 2 Workshop and Webinar during its General Assembly in Torino (January 2025). This event brought together several cutting-edge initiatives focused on urban air mobility, smart transport, and digital infrastructure. Among the showcased projects were **using Drones for Organ Transportation**, **Smart Capsule (ABzero)**, **TRIPS – Transport Intelligence Platform**, **Sumeri Moderni (Leonardo)**, and **5GBRAINs**. Participants explored real-world urban testing scenarios and discussed regulatory, operational, and technological perspectives with representatives from **Fondazione Piemonte Innova**, **LINKS Foundation**, **POLITO**, **CIM4.0**,

and **COTO**. The session highlighted the value of multi-stakeholder collaboration in shaping the future of drone-based services and 5G-enabled urban innovation.

Figure 26. 5G4LIVES project partners and stakeholders during the General Assembly in Torino

The 5G4LIVES project also aligns with national efforts to address energy poverty and promote sustainable energy solutions, such as the research initiative "Reducing energy poverty with innovative solutions" led by Riga Technical University, focused on evaluating green transition pathways. By identifying technically and economically viable energy solutions that reduce consumer costs and support public well-being, this project complements 5G4LIVES' broader mission to leverage technology for healthier, more resilient urban environments.

In parallel, 5G4LIVES aligns with the CERITA project, which promotes circular economy principles in waste management in Riga and Tartu. The integration of smart technologies—such as sensor-based monitoring and automated data flows—creates opportunities for 5G infrastructure to enhance the efficiency, sustainability, and responsiveness of urban public services across sectors.

2.3 PARTICIPATION IN CONGRESSES AND OTHER EVENTS

The 5G4LIVES project had a strong presence at the **Smart City Expo World Congress (SCEWC)** in Barcelona, both through its dedicated stand at the **Nordic-Baltic Pavilion** and an engaging Agora panel session titled *"Urban Air Mobility by 5G Solutions: Accelerating Drone Services."* The high-level discussion featured project partners from Riga, Forum Virium Helsinki, and the European Commission, sharing insights on how 5G infrastructure can support safe, scalable drone services in cities. Alongside the panel, the joint stand—co-hosted by Riga and VEFRESH—showcased Latvia's commitment to smart mobility, innovation procurement, and cross-border collaboration in urban air mobility.

Figure 27. 5G4LIVES and CITYAM representatives during the panel session at the SCEWC 2024

The 5G4LIVES project also contributed to the **Smart Skies seminar** held in Valmiermuiža on **February 12**, which brought together municipal stakeholders and experts to discuss the future of Urban Air Mobility in Latvia. During the event, Staņislavs Šeiko, representing the Riga Municipal Police and 5G4LIVES, presented Riga's experience with drone integration in public safety, including the testing of BVLOS (Beyond Visual Line of Sight) solutions. A discussion among municipal representatives followed, addressing the regulatory, technical, and resource challenges that both large and small cities face in adapting to upcoming European U-space airspace management frameworks.

Figure 28. Smart Skies seminar

The 5G4LIVES project was featured at the **Open & Agile Smart Cities & Communities (OASC) Digitalisation Awareness Forum**, hosted by Latvia's Ministry of Environmental Protection and Regional Development. During the session *"Who Needs Digital Twins"*, Arnis Gulbis from Riga Digital Agency presented how 5G4LIVES demonstrates the tangible benefits of digitalisation for public safety and urban planning. He showcased real-life applications where 5G-enabled drones are used to monitor waterside safety in Riga and support avalanche detection in Turin. These examples illustrate how local digital twins and next-generation connectivity are already enhancing emergency response, transforming manual, risk-prone tasks into smart, data-driven operations that actively save lives.

Figure 29. 5G4LIVES presentation during OASC Digitalisation Awareness Forum

At the **Mobile World Congress 2025**, representatives from Città di Torino and LMT Innovations took part in showcasing the technological advancements and use cases developed within the 5G4LIVES project. Their participation highlighted the growing role of 5G-enabled solutions in public safety and emergency response, reinforcing the project's visibility in one of the world's leading platforms for digital innovation and mobile technology.

Figure 30. LMT Innovations representatives at the Mobile World Congress 2025

The 5G4LIVES project was also showcased during the **Eurocities Network Mobility Forum 2025**, hosted in Riga from **March 19–21**. Under the theme *"Collaborating Beyond Boundaries: Sustainable Mobility for All,"* the event gathered over 170 urban mobility leaders from across Europe. Riga highlighted how digital solutions like **5G-enabled drones** are already enhancing public safety and mobility, with 5G4LIVES presented as a key example of innovation in action. The forum featured dynamic discussions, workshops, and site visits, demonstrating how emerging technologies, data, and collaboration can shape more inclusive, connected, and resilient cities.

Figure 31. Eurocities Network Mobility Forum 2025

The 5G4LIVES project was actively represented at the **Digitaler Salon** hosted by the **Alexander von Humboldt Institute for Internet and Society (HIIG)** on **April 30**, in a session titled *"Technologie als Katastrophenhelfer oder leere Versprechung?"* (Technology as Disaster Helper or Empty Promise?). The event explored why many promising rescue technologies—like drones or satellite-supported emergency response—struggle to transition from prototype to practical deployment. These discussions closely aligned with 5G4LIVES' mission, highlighting shared challenges such as the lack of sustainable financing, limited scalability, data governance, and reliance on resilient infrastructure like 5G networks. The forum reinforced the need for integrated systems and upskilling efforts, which are central to 5G4LIVES' ongoing work, including its upcoming training programme for civil protection teams in Riga.

Figure 32. Digitaler Salon session "Technology as Disaster Helper or Empty Promise?''

The 5G4LIVES delegation from Riga Digital Agency and VEFRESH participated in the **ITS European Congress** in **Seville,** bringing together leaders in smart mobility and innovation. The team engaged in key discussions around urban air mobility, drone industry developments, and the evolving regulatory landscape, gaining valuable insights to strengthen future pilot deployments and partnerships. The project team joined the session *"Innovation and implementation lessons from drone deployments"*, featuring experts from DGT, Continental, SkeyDrone, and ITG, which sparked new reflections and collaborative opportunities. The event further amplified 5G4LIVES' presence on the European stage and deepened its network in the intelligent transport systems community.

Figure 33. 5G4LIVES representatives at the ITS European Congress 2025

The 5G4LIVES project was proudly represented at the **KI Park Summer Event**, a vibrant gathering showcasing the latest in robotics and artificial intelligence. One of the central themes—how AI is increasingly transitioning from virtual simulations to real-world applications—resonated deeply with the mission of 5G4LIVES. Our initiative embodies this shift by deploying AI-powered drones for lifeguarding and rescue operations, turning advanced simulations into tangible life-saving tools. The event also highlighted key insights on synthetic training environments, ethical AI, and cybersecurity, crucial considerations for the responsible development of critical rescue technologies. The connections and inspiration gained from KI Park will directly inform 5G4LIVES as we continue innovating at the intersection of AI, robotics, and public safety.

Figure 34. KI Park Summer Event 2025

On May 28, 2025, the 5G4LIVES team—representing LMT Innovations, Riga Digital Agency, the Riga Development Department, VEFRESH, and Politecnico di Torino—participated in the **Drone Summit 2025** in Riga, a key event showcasing how drones and 5G technologies are transforming public safety. The summit provided a valuable platform to share insights, explore innovations, and highlight 5G4LIVES' contribution to smarter emergency response.

Figure 35. 5G4LIVES representatives at the Drone Summit 2025

In collaboration with our project partners, preparations are already underway for the **2025 edition of the Smart City Expo World Congress** in Barcelona, where 5G4LIVES aims to present new developments, strengthen cross-border cooperation, and further promote innovative solutions in smart mobility and urban air services.

3. 5G4LIVES EXPLOITATION AND MARKET EXPLORATION

3.1 BUSINESS AND EXPLOITATION STRATEGIES

3.1.1 Latvian Cluster

LMT exploitation of the 5G4LIVES results and scalability roadmap built on three pillars:

- Evaluation of pilot results and scaling opportunities – assessing the 5G4LIVES pilot outcomes in Riga and replication/scaling of these solutions to cases in the Region and larger industrial pilots.
- Development of innovative services on 5G4LIVES infrastructure by building new 5G-enabled services and business models on top of the deployed project infrastructure.
- Testing and validation of new use cases via the 5G4LIVES Platform. Continuing to use the 5G4LIVES technology platform as a testbed for emerging applications in public safety, industrial cases, critical infrastructure, smart cities, and smart mobility.

Participation of LMT in 5G4LIVES Pilots and expertise exploitation.

LMT will actively participate in the 5G4LIVES pilot demonstrations, studying and evaluating the effectiveness and performance of the developed platform and network solution. The core evaluation criteria will utilise advancements in 5G network capabilities and connectivity metrics, with a particular emphasis on the platform's efficiency, reliability, and scalability for industrial drone operation scenarios, specifically those involving BVLOS flights managed remotely from dedicated Remote Operation Control Centres.

Based on analysis and documented outcomes of the pilot activities, LMT aims to establish a methodological framework that outlines steps, actions and technical specifications required for deploying a dedicated 5G infrastructure. This framework will define parameters and prerequisites for reliable user equipment (UE) connectivity, suitable for industrial drone applications and other critical operational contexts. The methodological framework developed by LMT will serve as a structured guideline, ensuring seamless integration of 5G network infrastructure, optimised network planning, effective utilisation of resources, and compliance with national and international regulatory standards governing UAV operations.

Utilising the methodological framework and extensive experience gained through scenario and use-case development during the 5G4LIVES project, LMT will position itself strategically as both a technology and service provider. LMT's offering will include solutions for establishing and operating specialised 5G-enabled BVLOS operational sites and dedicated drone corridors. This business model encompasses the provision of critical infrastructure, managed connectivity services, advanced network management tools, and integrated operational software platforms necessary for the effective and secure management of drone missions from remote operational centres.

LMT's proposed solution package will include turnkey services dedicated specifically to the needs of diverse industry verticals, such as public safety, smart city management, critical infrastructure inspection, and urban mobility sectors. By utilising validated results from the pilot demonstrations, LMT will offer clients and strategic partners validated solution architecture, equipment configurations, compliance assurance mechanisms, and high-quality connectivity solutions and infrastructure.

Preliminary cases (examples):

- Stakeholders: municipality, state agencies, national service providers
- Services: search and rescue; critical infrastructure monitoring, safety and security

Value proposition:

- Providing advanced, validated 5G-enabled BVLOS drone operational solutions.
- Safe and reliable 5G connectivity for secure remote UAV mission management, UE communication and data sharing.

- Scalable frameworks and methodologies enabling simplified deployment for industry and public sectors.
- Ensured operational efficiency, safety, and regulatory compliance for critical infrastructure inspection, urban mobility, public safety, and smart city management.

Enabling technologies:
- Dedicated 5G SA/NSA infrastructure
- Remote Operation Control Centre (ROCC) technologies and components.
- Advanced solutions for operational automation and AI-driven analytics.

Strategic partners:
- Public sector entities (municipalities, emergency services, state agencies and service providers).
- Regulatory and legislation authorities (national aviation agencies).
- Drone technology providers and integrators (platforms, software, modules)

LMT has begun leveraging the expertise gained through its involvement in the 5G4LIVES project. Building on the experience and knowledge acquired, in 2025, LMT organised an international consortium and prepared a proposal for participation in the Call: CEF-DIG-2024-5GLSP-SMARTCOM-WORKS. The project proposal, titled "Next Generation Urban Communities with 5G" (NEXT5G), focuses on the development of innovative drone operation use cases within 5G infrastructure in BVLOS mode, specifically for port infrastructure services. The proposal applies the accumulated expertise from the development of the 5G4LIVES platform components and represents a scalable extension of those solutions to enable the deployment of new innovative services.

Development of innovative services based on the deployed 5G4LIVES infrastructure

Using the outcomes of deliverable D2.3, which contains detailed analysis of identified potential use-cases—including existing and future single use-case scenarios, and scaling opportunities for the 5G4LIVES concept—as well as using own methodologies for identifying and analysing new use-case scenarios, LMT, in collaboration with existing partners and potential future stakeholders, will define innovative new services and applications, that could be introduced in Riga Use-Case locations (as well as scaled beyond locations). These innovations will capitalise on the established 5G infrastructure and integrated platform components provided by the 5G4LIVES project.

The strategic aim is to continuously extend the capabilities and utilisation of the deployed 5G-enabled ecosystem, unlocking opportunities for advanced services in mobility services, critical infrastructure monitoring, public safety, and smart city applications, industrial cases, using several advanced technologies, like IoT, AI & digital twin platforms, etc.

Value proposition:
- Rapid creation and deployment of innovative and scalable 5G-driven services dedicated to critical infrastructure, public safety, urban mobility, and smart city solutions.
- Efficient collaborative environment facilitating co-creation with potential business-cases stakeholders, ensuring service acceptance and success.
- Maximised utilisation of existing infrastructure investments, significantly reducing time-to-market and associated deployment risks.

Enabling technologies:
- 5G network infrastructure optimised for advanced connectivity and real-time applications.
- Advanced UAV integration and management platforms supporting scalable operational deployments.

- Gamification and interactive scenario-development tools (LEGO Serious Play, simulation models) for effective stakeholder engagement and rapid use-case prototyping.
- AI and ML-driven analytics to enable automated, intelligent monitoring and decision-making.

Strategic Partners:
- Public authorities, municipal agencies, and smart city management entities.
- Emergency response, civil protection, and public safety organisations.
- UAV and robotic system technology providers.
- Software development companies specialising in AI-driven analytics and data visualisation.
- Research institutions and industry consortia driving innovation in mobility and critical infrastructure sectors.

During the 5G4LIVES midterm partner meeting (held by LMT on June 10, 2025, in Riga), LMT organised a dedicated workshop with the Riga-Case stakeholders. The workshop utilised interactive and engaging methodologies, including the LEGO Serious Play gamification technique and detailed location simulation models. Through these collaborative and creative exercises, preliminary directions and concepts for innovative services and business cases were pre-identified, laying the foundation for the subsequent detailed analysis and development phases.

Figure 36. Simulation map of the 5G4LIVES Riga-Case Location

Figure 37. Process of the gamification brainstorming for the definition of new innovative services.

Exploration of new potential Use-Cases on the 5G4LIVES technological platform

Considering both internally identified scenarios and those specified by 5G4LIVES stakeholders, along with a thorough analysis of modern challenges in drone operations and industrial use-cases related to critical infrastructure, LMT will explore opportunities for developing and deploying new complementary use-cases. These scenarios include drone detection and identification, counteracting unauthorised UAV flights, centralised management and orchestration of robotic automated platforms (including aerial drones and ground robots), and integration of services utilising machine learning (ML) and computer vision (CV) technologies for innovative, automated monitoring capabilities.

LMT plans to test, evaluate, and validate these emerging use-cases on the existing 5G4LIVES platform infrastructure, enabling advanced operational capabilities and addressing critical societal and industrial needs for future scalability of successful cases around the EU Region.

Value proposition:
- New services, ensured safety and security for the Industrial applications of the automated drone / robotic systems
- Centralised control of robotic platforms (aerial drones, ground robots, SUVs) for integrated operational management.
- Advanced automated monitoring through AI-driven analytics, significantly improving efficiency and operational insights.

Enabling technologies:
- 5G infrastructure and ecosystem
- Centralised robotic fleet management platforms.
- ML/CV-based analytics for automated detection and monitoring.

Strategic partners:
- Industrial partners (Ports, Cities, Critical infrastructure stakeholders)
- UAV manufacturers and robotics providers specialising in security and automation.
- New drone/robotics-related services and technologies providers
- AI/ML analytics solution providers.
- Regulatory and certification authorities within the drone ecosystem.

Table 2. Overview of Potential Partner Exploitation Strategy - Latvia

Partner Name	Key Results / Assets to Exploit	Intended Use	Target Market / Sector	Timeline for Exploitation	Estimated TRL	Comments
Integrated drone systems control centres (LMT)	Software-based solutions to support remote operations under BVLOS conditions in 5G network, multi-mission, centralised data sharing and management	Solutions to support centralised remote operations	Civil protection, smart city services, logistics, transport, and ports	n.a.	6-8	none

3.1.2 Italian Cluster

Windtre aims to exploit the results of this project for these main reasons:

1. R&D and Testing purposes in a real scenario to evaluate the added value of 5G connectivity for:
   1. Real-time transmission of data/video (throughput and latency) for safety/emergency
   2. Real-time control and reactivity of the drone (latency)
2. Use this project as an important reference to accredit Windtre with Civil Protection and Government in general as a provider of 5G connectivity services to support Emergency/Safe&Rescue/Police operations.
3. Set the hypothesis for a specific Business Model to offer 5G services to enable Use Cases connected drone applications for the Public or Private Market

5G for Safe&Rescue application is one of the Use Cases that can be offered at the Regional or National level, thanks to the new 5G Slicing, supported by Stand Alone upgrade of the Windtre 5G Network. The trial will give the numbers of throughput and latency needed to evaluate a Regional or National 5G slice-based offering to Civil Protection, to support drone missions for different Use Cases. Windtre is intended to approach the application of 5G to support drone missions, both in VLOS and BVLOS, always on a project basis for what concerns Use Cases and Network Radio Coverage needs.

Referring to Network Radio Coverage, Windtre is evaluating to offer in the future 5G services for drone missions under a:

1. regional/national 5G Slice on Public Radio Coverage (under a project basis feasibility) with guaranteed SLA for throughput, latency, traffic priority and network congestion avoidance mechanisms
2. dedicated/private Radio Coverage (under a project basis feasibility), designed and operated where needed.
3. Windtre offering of 5G services for drone applications will leverage partners (e.g. providers of drones and specific device/software), to be able to provide an end-to-end solution, not only connectivity.

Windtre Business Model of the offer (temporarily named) **"Windtre 5G Emergency & Environmental Response-as-a-Service (5G-EERS)"** is under evaluation, it's based on:

1. **Value proposition:** an integrated service to manage:
   o Emergency missions (fires, landslides, floods, earthquakes)
   o Environmental control (pollution, forest fires, hydrogeological instability)
   o Real-time monitoring via drones connected to the 5G network

2. **Enabling Technologies:**
   o 5G Network Slicing: creation of dedicated and ultra-reliable "slices" for critical missions.
   o MEC (Multi-access Edge Computing): real-time data processing close to the intervention site.
   o Autonomous drones: equipped with thermal, optical, and environmental sensors.
   o AI & Analytics: for predictive analysis and automatic recognition of critical situations

3. **Strategic Partners**
   o Drone manufacturers (e.g. Leonardo, DJI Enterprise).
   o Software houses for mission planning, AI, and GIS.
   o Public bodies and universities for R&D and scientific validation.
   o Civil Protection as a customer and co-developer.

Windtre 5G-ERRS offer model should be:
   o Annual subscription fee for access to the platform and a dedicated 5G network.
   o Pay-per-use Pricing per mission or hour of drone flight.
   o Premium services: Predictive analysis, advanced reporting, simulations.
   o Software licensing: Licenses for the use of mission and analysis software.
   o Training and support Courses for Civil Protection operators and technicians.

Benefits for Civil Protection are:
   o Reduction of response times by 30–50%
   o Coverage of remote or dangerous areas without risk to personnel
   o Increased accuracy in damage assessment
   o Historical and predictive data for prevention.

Table 3. Overview of Potential Partner Exploitation Strategy - Italy

Partner Name	Key Results / Assets to Exploit	Intended Use	Target Market / Sector	Timeline for Exploitation	Estimated TRL	Comments
DJI (MoT)	High performance for battery, video capture and thermal sensor	Drone for Monitoring and searching missions	Civil Protection, Logistics, Trasport, Oil&Gas, Large Constructions	n.a.	9	none
DROMT (MoT)	Software platform to support flight plans, authorisations, live streaming image analysis	Software to support flight's activities	Civil Protection, Logistics, Trasport, Oil&Gas, Large Constructions	n.a.	8	none

Although not a direct partner of the project, some subcontractors might have the potential to exploit some of the project results on the market.

3.2 MARKET IDENTIFICATION

3.2.1 Latvian Cluster

LMT identifies several key sectors and vertical markets significantly benefiting from enhanced capabilities provided by the integration of 5G connectivity for drones and robotics platforms (SUV, etc). LMT's targets include both Public and Private sector clients:

- Civil protection and safety
- Innovative Urban Mobility and Smart City Initiatives

- Critical Infrastructure
- Industrial use-cases, Inspection and monitoring

LMT is actively evaluating various use-cases involving aerial drones, robotic systems, and integrated monitoring platforms, particularly for public safety and industrial / infrastructure applications. Some examples of potential use-cases include:

- Monitoring of the environment using 5G IoT technologies
- Connectivity solutions for Inspection and preventive maintenance of critical infrastructure
- Urban mobility monitoring (traffic management).
- Innovative services for the IAM – DaaS, connectivity and network infrastructure
- Innovative services for Ports – remote inspection with automated anomaly detection with computer-vision solutions, connectivity and network infrastructure

These scenarios have been preliminarily validated through partners' interactions, preliminary use-case workshops, and internal market analysis.

Customer needs and benefits: primarily focus on the following benefits:

1. Cost efficiency by significant reduction in operational costs, time, and errors compared to traditional monitoring methods.
2. Automation – minimised human involvement in routine operations, as well as reduction of the human and/or environmental factor.
3. The need for solutions ensuring 5G mobile network connectivity, critical to enable the deployment and operation of industrial use cases.
4. Real-time, high-quality data sharing and analytics.

3.2.2 Italian Cluster

Windtre sees several target sectors or vertical markets that could benefit from 5G enhancement on 5 G-connected drones. We consider targets both Public and Private Customers:

1. Public Safety (civil protection, police)
2. Ports
3. Airports
4. Oil&Gas
5. Large Constructions

Windtre is evaluating Use Cases involving aerial and terrestrial (dog robots) drones, even for industrial applications, in addition to Use Cases for Safe&Rescue. For example:

- Sea sand movement monitoring (Ports)
- Inspection of hazardous sites (Oil&Gas)
- Security plant border patrol (All)
- Large Area Inspections (All)
- Large infrastructures/constructions monitoring and inspections (Large Constructions)
- Large-scale chemical detection through multi-spectral sensors (Oil&Gas).

All the above Use Cases have been directly suggested by Customers Windtre is talking to during these months.

The customer's needs have gone in many directions:

- Cost Saving: comparing the costs related to flying a drone to using a different method that involves people, and very expensive equipment
- Safety and lower risks: no humans involved with drone operations
- Timeliness of intervention: for emergencies, when unexpected circumstances arise
- Automations: easy scheduling of recurring drone missions
- Real-time data and control of the drone: thanks to 5G connectivity

An economic estimate of the benefits deriving from the use of 5G drones in Civil Protection can be made considering various factors, even if there are no univocal official figures yet. However, we can rely on market data and operational efficiency projections.

Economic context data (Italy, 2025):

- The professional drone market in Italy reached 160 million euros in 2024, with a 10% growth compared to 2023
- Projections for 2025 indicate further expansion, especially in the public and public utility sectors (B2G), such as Civil Protection
- The "Aerial Operations" segment (monitoring, inspections, emergencies) represents 96% of the market

Estimated economic benefits

Here are some potential economic benefits:

Table 4. Estimated Economic Benefits

Benefit item	Qualitative estimate	Possible annual value (Italy)
Reduction of intervention times	High	Savings estimated: €10–20 million (e.g. fires, landslides)
Reduction of operating costs (e.g. helicopters, personnel)	High	Savings estimated: €15–30 million
Prevention of damage (e.g. floods, fires)	Very High	Damage avoided: €50–100 million
Logistics efficiency and coordination	Medium	Savings estimated: €5–10 million
Induced value (training, innovation, businesses)	High	Growth estimated: €20–40 million

Estimated total potential annual economic benefits: €100–200 million, considering only the Civil Protection and public services area.

These estimates are indicative and depend on:

- Level of adoption on a national scale.
- Integration with 5G infrastructures.
- Regulations and interoperability between entities.

If compared with traditional technologies, the main benefits are:

- Time response reduction
  - 5G Drones: Immediate response with real-time data transmission
  - Traditional Helicopters: Delayed response due to preparation and deployment time
  - Satellite Monitoring: Delayed response due to data processing time
  - 4G-Connected Drones: Faster than helicopters but slower than 5G drones

- Operational costs reduction
  - 5G Drones: Lower operational cost due to automation and efficiency
  - Traditional Helicopters: High operational cost due to fuel, maintenance, and personnel
  - Satellite Monitoring: High cost due to satellite deployment and data processing
  - 4G-Connected Drones: Lower cost than helicopters but higher than 5G drones

- Damage prevention
  - 5G Drones: High accuracy in damage prevention due to real-time monitoring and AI analysis
  - Traditional Helicopters: Moderate accuracy due to limited data and manual observation
  - Satellite Monitoring: High accuracy but delayed due to data processing time

o 4G-Connected Drones: Moderate accuracy, better than helicopters but less than 5G

Figure 38. Estimated Economic Benefits of using 5G drones for Civil Protection in Italy
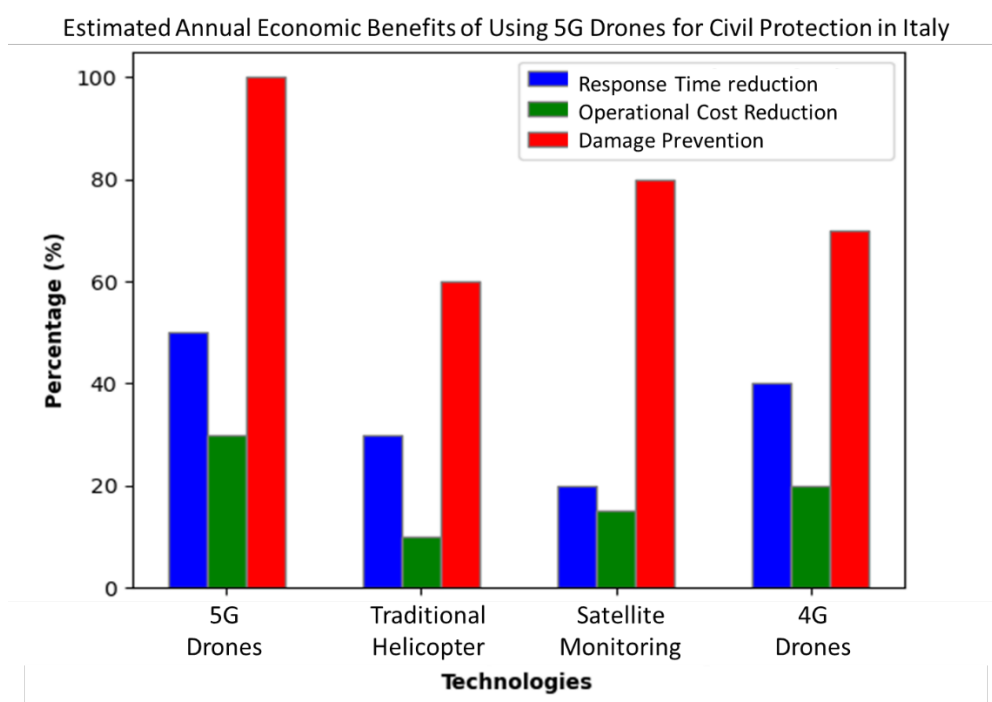
3.3 IPR STRATEGY

DROMT Srl, a technology supplier for the Municipality of Torino within the framework of the 5G4LIFE project, is the holder of a patent related to a method for managing a fleet of unmanned aerial vehicles. The patented method and its associated results are actively utilised in the execution of the project.

In addition to the patented innovation, the following results developed within the project are considered suitable for further intellectual property protection and valorisation:

- A platform for managing drone flights, enabling mission planning and operational control.
- A methodology for assessing flight risk based on the detection and analysis of population density in the target area.
- An automatic or semi-automatic method for managing flight authorisations, aimed at streamlining regulatory compliance and operational efficiency.

Table 5. IPR Strategy

Partner Name	Foreground Results Created	Type of IP	Protection Status	Shared with Other Partners?	Licensing Intent	Comments
DROMT srl	method for managing a fleet of UAVs	Italian patent	Existing	N	Y	In the future, when the regulation The framework will be consistent, it will be included in the

						platform DROMThub
DROMT srl	Platform for managing of UAV flight	Patent	Potential	N	Y	Included in platform DROMThub
DROMT srl	Definition of people Density	Patent	Potential	Y (PoT)	Y	
DROMT srl	Managing of authorization	Patent	Potential	N	Y	
Politecnico di Torino	Methodology for safe mission planning	Patent	Potential	Y (DROMT srl)	Y	For the exploitation of the methodology, implementation in DROMTHub could be useful.

3.4 BVLOS METHODOLOGY

One of the outcomes of the 5G4LIVES project is the definition of a methodology for BVLOS mission planning, validation and monitoring. The main methodology and some implementation details are already described in deliverables D2.2 and D3.2, while the implementation will be completed in Task T3.6 (by M23).

The methodology enables the planning of a drone mission in compliance with regulatory constraints, including risk assessment, as well as the implementation of risk mitigation and risk awareness tools.

To make the methodology accessible and user-friendly, one of the project outcomes is the development of a web application that serves as an interface for UAS operators.

In brief, the web application will support:

- definition of the operational area (and/or flight plan) and mission parameters
- risk assessment using risk maps and based on SORA
- risk-aware planning and route validation
- Mission monitoring with integrated risk awareness tools to alert the operator in case of hazardous situations
- online risk-aware route planning

The above functionalities are essential to ensure safe flight operations, particularly in BVLOS scenarios, where mission planning and risk assessment must be aligned with drone regulations.

The web app implementing the methodology will be developed with a focus on the use case in Turin, and partially also on the use case in Riga. However, the methodology is potentially compatible at the European level, as it is designed to be aligned with SORA, a risk assessment methodology adopted by EASA. Moreover, given the widespread acceptance of SORA within the drone community, several non-EU countries are also considering adopting SORA or slightly adapted versions of it. Notably, countries such as Canada and Australia have shown strong interest, and even the FAA in the United States is evaluating the adoption of an adapted version of SORA for BVLOS operations.

The tool and the methodology for BVLOS mission planning, validation, and monitoring have the potential to be exploited beyond the duration of the project, including for commercial applications.

The tool and methodology are of interest to UAS operators as well as to National Aviation Authorities (e.g., ENAC in Italy). Moreover, such a tool would be valuable for future UTM systems, as it can support operators in safe and risk-aware mission planning.

As highlighted in other deliverables, data plays a crucial role in the effectiveness of this tool: the quality of the risk assessment and the resulting safe mission planning is directly dependent on the quality of the data. In particular, the 5G4LIVES consortium includes ideal partners capable of providing both connectivity data and population density data, which are especially valuable for drone missions in connected and populated areas.

3.5 REGULATORY CONSTRAINTS

Unmanned Aerial Vehicles (UAVs) used in public safety and civil protection operations—such as those piloted in the 5G4LIFE project—are governed by a robust legal framework at both European and national levels. These frameworks seek to ensure safety, airspace coordination, data protection, and public trust in drone-enabled services.

1. Airspace and Operational Regulation

The European framework for UAV operations is governed by EU Regulations 2019/947 and 2019/945, enforced by EASA (European Union Aviation Safety Agency).

Key provisions include:

- Risk-based categorisation (Open, Specific, Certified): Most public safety operations with drones fall into the Specific category, requiring a pre-defined risk assessment (SORA).
- BVLOS operations, as tested in 5G4LIFE, require special authorisation and pilot certification (e.g., STS-02).
- Geographic zones (UAS Zones) and NOTAMs must be respected, particularly in urban environments and near critical infrastructure.
- In emergency contexts, Article 17 exemptions allow for the temporary suspension of certain operational limitations under national Civil Aviation Authority (CAA) oversight.

The regulatory aspects mentioned above are common across Europe, which indicates that the outcomes of the 5G4LIVES project have the potential to be exploited at the European level.

One important aspect to highlight is that the current UAS regulation is particularly strict when it involves BVLOS missions. This choice is fully justified, given that BVLOS represents an emerging and potentially high-risk scenario if not properly managed.

However, the UAS ecosystem is rapidly evolving, and shortly, with the adoption of increasingly reliable and technologically advanced drones, regulatory frameworks are expected to evolve as well, progressively opening up to more widespread BVLOS operations.

2. GDPR and Personal Data Protection

Drone operations involving video capture or aerial imaging are likely to process personal data, particularly when individuals are identifiable (e.g., during beach rescues or urban monitoring).

The application of the General Data Protection Regulation (GDPR) to UAV-based data collection introduces several legal obligations:

- Lawful Basis: Public interest or vital interest may justify processing, but the principle of proportionality must always be respected.
- Data Minimisation: Only data strictly necessary for the task (e.g., geolocation, heat signatures) should be captured.
- Transparency and Information: While real-time operations may limit immediate notification, signage, public campaigns, and post-operation communication can help fulfil GDPR's transparency obligations.
- Data Retention: Captured data (e.g., aerial images or livestreams) must be retained only as long as necessary and securely deleted thereafter.
- Access Controls and Security: UAV systems and control centres must include technical safeguards to prevent unauthorised access or data breaches. Encryption and logging are recommended best practices.

Under Article 35, a Data Protection Impact Assessment (DPIA) is required when drone surveillance poses a high risk to the rights and freedoms of individuals, especially when using innovative technology like 5G live streaming or AI-based analysis. Privacy and GDPR topics are already positively managed in the existing and open-to-market DROMThub platform.

The features, including fleet management and BVLOS, are currently on hold due to the Italian and European UAV operation normative. In the next feature, DROMT srl has scheduled to open a trial with ENAC to validate these features.

3. Ethical and Social Considerations

In addition to legal compliance, societal acceptance hinges on ethical use. This includes:

- Avoiding any perception of mass surveillance

- Ensuring equality of service delivery (e.g., emergency coverage across all districts)

- Communicating clearly and proactively with the public about what drones do and do not do

4. 5G4LIVES STANDARDISATION

The 5G4LIVES project actively contributes to the ongoing evolution of standards for UAS operating in complex environments, leveraging 5G connectivity for enhanced mission capabilities. In particular, the project can contribute both to the enhancement of existing standards and to the development of new standards.

4.1 CONTRIBUTIONS TO EXISTING STANDARDS

UAS Communications over 5G (3GPP)

5G4LIVES includes real-world deployment and testing of drone operations using public 5G networks. The outcome of the 5G4LIVES project can be exploited to define some network features, such as Quality of Service (quality of service), latency, bandwidth, and reliability requirements for UAS. Moreover, the results can be exploited to directly contribute to the assessment of standards defined by 3GPP, particularly:

- Support for aerial UEs (Unmanned Aerial Vehicles as 5G-connected clients)
- Integration of drones in 5G network management and mobility procedures
- KPI benchmarking for mission-critical applications such as video surveillance and real-time risk monitoring

UAS Traffic Management and BVLOS Operations

Flight operations will be conducted in BVLOS conditions within regulatory-critical environments and represent unique use cases both in Italy and Latvia. For this reason, the results and lessons learned from the project can be leveraged to provide feedback and recommendations to the National Aviation Authorities, and consequently to EASA, for a future revision of the UAS regulatory framework and the integration of BVLOS drone operations into airspace management, contributing to both UTM and ATM developments.

The operational feedback and lessons learned during the route planning and execution phases will help validate the applicability of existing standards to real-world 5G-enabled BVLOS missions in urban and peri-urban contexts.

4.2 DEVELOPMENT OF NEW STANDARDS

Standardisation of BVLOS Mission Planning Tools

5G4LIVES develops a web-based mission planning tool that supports BVLOS operations through automated SORA-based risk analysis and risk-aware path planning generation, also considering the 5G network coverage. The tool architecture and methodology may serve as a basis for:

- Defining functional and architectural requirements for future BVLOS mission planning tools
- Standardising interfaces (APIs) between planners, drone systems, U-space providers, and competent authorities
- Proposing validation protocols and formats for documenting the safety of planned missions

Such efforts aim to support the emergence of a standardised planning toolchain for safe and scalable drone BVLOS operations.

CONCLUSIONS

The first 18 months of the 5G4LIVES project have demonstrated clear success in achieving its communication, dissemination, community building, and exploitation objectives. The initiative has not only built strong internal coordination across its Latvian and Italian clusters but also made a significant external impact through a blend of policy-oriented, technical, and public engagement strategies.

The communication and dissemination efforts ensured widespread visibility and understanding of the project's goals and progress. High engagement across social media, websites, conferences, and press activities has elevated the public and institutional awareness of 5G-enabled drone applications in civil protection and environmental monitoring. The project branding and narrative are now widely recognised and associated with innovation and societal value.

Community-building activities, including collaborative events, training package development, and participation in pan-European networks, have laid a foundation for longer-term knowledge exchange and replication. Strong collaborations with CITYAM, IPROMO, and others have helped establish 5G4LIVES as a leading example of cross-sector innovation in urban air mobility and emergency response.

The market exploration and exploitation activities have already translated into tangible strategic directions, particularly through LMT's structured roadmap for BVLOS operations and Windtre's conceptual 5G-EERS model. Both indicate strong potential for economic, safety, and operational benefits across Europe, with early interest from government and industry stakeholders. The alignment with EU regulatory frameworks (especially SORA) ensures that the outcomes of the project can be transferable and scalable across borders.

The conclusions from this interim period affirm that the project is well-positioned to deliver on its full scope. The next 18 months will be critical in translating strategy into operational outcomes, demonstrating real-world use cases, refining training and policy tools, and fostering replicability across EU regions. As 5G4LIVES advances into its next phase, its foundation of strong partnerships, robust methodology, and growing visibility offers a promising path toward more resilient, technologically empowered communities.