2025

Open Calls – Results

FIDAL Project

fidal field trials beyond 5G

SUMMARY OF EXPERIMENTS AND IMPLEMENTATIONS

Results Achieved by 3rd Parties involved in 6G SNS Projects through the mechanism of Cascading Funding – Open Calls

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FIDAL PROJECT

Field Trials Beyond 5G

OVERVIEW

The FIDAL (Field Trials beyond 5G) project, funded under the European Union's Horizon Europe programme, stands at the forefront of Europe's efforts to shape the next generation of communication technologies. Operating within the Smart Networks and Services Joint Undertaking (SNS JU) framework, FIDAL seeks to consolidate European leadership in the evolution from 5G towards Beyond 5G (B5G) and 6G ecosystems, where ultra-high capacity, ultra-low latency, energy efficiency, and massive connectivity will define the communication networks of the future.

At its core, FIDAL represents a pan-European collaborative initiative designed to transform advanced network concepts into real-world applications through large-scale field trials. By developing and integrating open, interoperable testbeds, FIDAL enables researchers, developers, and industry actors to explore new network architectures and experiment with emerging services that will define future digital societies. These infrastructures serve as open experimentation spaces for testing advanced connectivity, edge computing, and intelligent network orchestration across a variety of industrial and societal domains.

The project's approach is rooted in the belief that innovation in network technologies should be inclusive, practical, and user-driven. FIDAL promotes open architectures, shared infrastructures, and multi-stakeholder participation, ensuring that its outcomes directly support European competitiveness, standardization leadership (e.g., 3GPP, ETSI), and sustainable innovation across sectors.

To enable this vision, FIDAL has deployed three advanced 5G-evolved testbeds strategically located across Europe (Norway, Greece, Spain). These testbeds serve as the technical foundation for the project's experimental activities, allowing for realistic validation of applications and services that depend on high-speed, low-latency, and reliable connectivity. The infrastructures integrate components of cloud-native network functions, programmable interfaces, and edge resources to host trials in representative environments.

FIDAL's experimentation domains are organized around two key verticals reflecting the technological and societal relevance of Beyond 5G applications: Media and Creative Industries and Public Protection and Disaster Relief (PPDR). Through these use cases, FIDAL not only validates technological capabilities but also assesses user acceptance, interoperability, and scalability—elements crucial for bridging the gap between research and deployment.

A central pillar of FIDAL's strategy is its Open Call programme, designed to extend the project's innovation ecosystem beyond the consortium by engaging external entities such as SMEs, start-ups, research institutes, developers, and infrastructure owners. The Open Calls invite these "third parties" to design and implement Beyond 5G field trials using the FIDAL testbeds, frameworks, and network applications.

The first iteration of the programme, FIDAL Open Call 1, was launched in April 2024 and concluded in March 2025, marking a full year of intensive experimentation and cross-sector collaboration. With a total budget of €4 million, the call attracted a significant response from across Europe, ultimately funding 19 sub-projects that explored applications in the project's three priority domains—Media, PPDR, and Time-Critical Applications.

These sub-projects collectively represented a wide spectrum of innovative trials, from low-latency cloud production for broadcasting, to AI-assisted emergency communication systems, and ultra-reliable control solutions for robotics and transport. The experiments were carried out across the existing FIDAL testbeds and, in some cases, integrated additional infrastructures provided by external partners. The outcomes of Open Call 1 delivered measurable progress in performance benchmarking, interoperability testing, and technology transfer, demonstrating FIDAL's flexibility as an experimental environment and its capacity to accommodate a diversity of use cases.

Building on the success of the first call, FIDAL Open Call 2 was launched in September 2024 and runs until January 2025, with a total budget of €2 million and a duration of approximately nine months for each funded action, funding another 9 sub-projects. This second call continues to focus on the same core verticals—Media and PPDR— and places increased emphasis on large-scale experimentation, integration of external datasets, and inclusion of new testbeds when these bring clear added value to the project.

In both Open Call cycles, applicants are encouraged to propose either single-beneficiary trials deploying new use cases within FIDAL's existing infrastructures, or collaborative proposals involving complementary partners and potentially new services or facilities that expand the project's ecosystem. Funding is provided up to €150,000 per individual project or €250,000 for collaborative consortia.

Together, the two Open Calls constitute a cornerstone of FIDAL's mission to demonstrate and validate the real-world potential of Beyond 5G technologies. By combining advanced testbeds, open participation, and targeted vertical domains, FIDAL creates a unique environment where innovation meets application, driving forward Europe's transition toward 6G-enabled ecosystems. The following sections of this report present the results and lessons learned from the FIDAL Open Call sub-projects, highlighting their contributions to technological advancement, cross-sector collaboration, and the shaping of future digital infrastructures.

Observations

The FIDAL Open Call programme has become a successful model for European open innovation in Beyond 5G (B5G) field experimentation. Through two consecutive calls, the initiative has engaged 53 stakeholders across 28 funded projects, fostering collaboration between SMEs, research institutions, universities, and industry partners. SMEs represented the majority of participants (55%), confirming the programme's effectiveness in empowering smaller technology developers to access advanced 5G and B5G infrastructures.

The Open Calls attracted participants from 11 European countries, with Greece, Spain, Italy, and Norway among the most active contributors. This wide geographic spread highlights FIDAL's role as a

unifying platform that bridges regional ecosystems and promotes cross-border innovation. Collectively, the two calls have supported the execution of over 25 field trials in three distinct testbeds, validating technologies for Media and Creative Industries, Public Protection and Disaster Relief (PPDR), and Time-Critical Applications.

The diversity of participants translated into equally diverse experimentation outcomes. Many projects demonstrated latency below 10 ms, AI-assisted network orchestration, and the deployment of edge-enabled services—tangible advances that point toward 6G-readiness. The consistent integration of cloud-native architectures, network slicing, and multi-access edge computing (MEC) across trials confirms the maturity of Europe's research and development capacity in this field.

Another key observation concerns the collaboration balance: while SMEs led most of the innovation-driven projects, research and higher-education institutions played a pivotal role in system validation and benchmarking, ensuring scientific rigor and reproducibility. The participation of large industry actors provided valuable integration expertise, facilitating smoother pathways from prototypes to potential market solutions.

Overall, the FIDAL Open Call programme has demonstrated the viability of open, competitive funding mechanisms to extend the reach of large-scale EU projects. By combining structured support with real-world experimentation environments, it has generated both technological and socio-economic value, positioning Europe as a leader in the transition toward the Beyond 5G and 6G era.

OPEN CALL 1

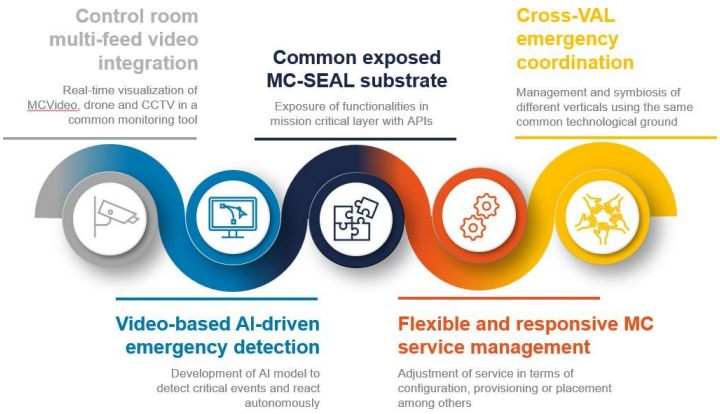
FIDAL-VLC: 5G Robot Race

OC Project Title	FIDAL-VLC: 5G Robot Race
Beneficiary(s) info	UPV, Fivecomm, Robotnik Automation / Spain
Project Description & Achievements	 The subproject aimed to demonstrate the integration and validation of an advanced Beyond 5G (B5G) testbed combining immersive teleoperation, AI-enhanced perception, Digital Twins, and private 5G connectivity. The use case selected to validate the testbed was a competitive race between two mobile robots, one physical and one virtual, both remotely driven by users from immersive cockpits located indoors at UPV Immersive Laboratory. The race took place outdoors at the UPV velodrome, showcasing the capabilities of a real-time digital twin environment built on a private 5G standalone (SA) network. The system integrated multiple technical components: 360º adaptive video streaming, AI-based person detection at the edge, haptic feedback mechanisms, and GNSS-based augmented reality (AR), all orchestrated via a Cloud Robotics platform and visualized through a digital twin interface in virtual reality (VR). The sub project culminated in a large-scale trial where KPIs and KVIs were measured simultaneously. On the one hand, KPIs evaluated included 5G network throughput and latency, end-to-end command-to-effect delays, adaptive video streaming efficiency, AI inference time, and robot energy consumption. On the other hand, KVIs were assessed through a QoE survey that confirmed the success of the use case in fostering immersion, skill acquisition, and user engagement. Key dissemination outcomes include a scientific publication at EuCNC & 6G Summit 2025, coverage by national media, and multiple audiovisual materials produced for public and academic engagement. The datasets and code developed during the project have been made publicly available through Zenodo, IEEE DataPort, and GitHub. Beyond its technical achievements, FIDAL-VLC has demonstrated relevance for markets such as critical infrastructure inspection and remote driving training and has addressed social challenges related to safety issues.
Vertical	Media, Entertainment, Time-Critical Applications
Testbed	UPV, Valencia (Spain)
Implementation timeframe	May 2024 – April 2025 (final demo March 12th 2025)

B5GVN

OC Project Title	B5G Video Net (B5GVN) under FIDAL
Benefiaciary(s)/Country	LiveU, Israel
Project Description	B5GVN has built, tested and demonstrated advanced usages of live sports and news remote production scenarios over the FIDAL beyond-5G platform at UoP and Maestro, using mulli-link multi-slice bonded UL. The B5G capabilities were slices, network exposure via APIs, edge cloud for hosting NetApp applications, private 5G network (NPN – Non-Public Network), and QoS via spectrum carving. **Main results**: All three remote production use cases were trialed: remote production to the cloud, remote production to the MNO Edge cloud, remote on-site production. Multiple variations of these UCs were tested. For example, various types and configurations of slices, of number of modems being bonded, of carved spectrum for guaranteed BW, indoors and outdoors etc. The trials explored the behavior, variety and therefore benefits of guaranteed bandwidth for broadcasters of news, sports and events in their remote production. In some of the UCs we used FIDAL Maestro platform with its network exposure APIs along with our own PoC portal developed in this project, to order our LiveU bonding receiver service in the MNO edge cloud (@ UoP testbed). With these capabilities, the broadcaster can then schedule an event and order a LiveU bonding SW receiver to run on the MNO edge cloud at the intended time, along with the relevant cloud processing resources and the 5G guaranteed network resources. This demonstrates the power of guaranteed bandwidth via slices and network exposure-based service ordering, when coupled with bonding to ensure reliability, quality and cost-effectiveness for the users along with efficient resources management for the MNOs. End users can be broadcasters and media groups, but may also be first responders, disaster management agencies etc. who may need to guarantee their transmission of live quality video under resources-limited conditions. The basic workflow will be demonstrated in EUCNC in the FIDAL booth.
Vertical	Media
Testbed	Patras 5G testbed
Implementation timeframe	Project: May 2024 – May 2025 Trials: two cycles, Nov 7th – 13th Nov 24 and 7th – 10th Apr 25.

MC-SEAL

OC Project Title	Mission Critical SEAL as enabler of AI-based emergency coordination and decision-making
Benefiaciary(s)/Country	Nemergent Solutions SL/ Spain Nuuk Technologies SL / Spain
Project Description	The **MC-SEAL** demonstration explores new ways of exposing 3GPP compliant Mission Critical Services (MCX), following a Service Enabler Architecture Layer (SEAL) approach. The SEAL substrate based on MC services will be exposed to the vertical, which will handle AI-based Threat Detection and Video Orchestration from various sources such as drones, body cameras, video surveillance cameras, smartphones.  *Figure 1 MC-SEAL UC infographic* This integration fosters decision-making by automating processes in control rooms and promotes the coordination of resources for efficient emergency management. The followed approach streamlines the integration of situational awareness and control rooms related verticals with new and advanced Mission Critical Systems, accelerating the transition to these future communication solutions. **Results:** MC-SEAL has successfully delivered strong results in innovation (SEAL and MCX standards synergy approach), development (new SEAL APIs proxy and MC Endpoint), deployment (multi-geographic deployment and stringent third-party security requirements), experimentation (5G QoS and Slicing impact on crowded traffic environments), dissemination (live demonstrations to relevant industry stakeholders at SNS4SNS and PSCE), and procedure (compliant to MCX and SEAL technical standards and to ISO9001 and ISO14001 procedures). MC-SEAL showcases an innovative approach to integrating 3GPP-compliant MCX with control room operations, improving emergency response through automation and coordination, focusing on faster, smarter decision-making in critical situations. This results in agile and more efficient action when it matters most.

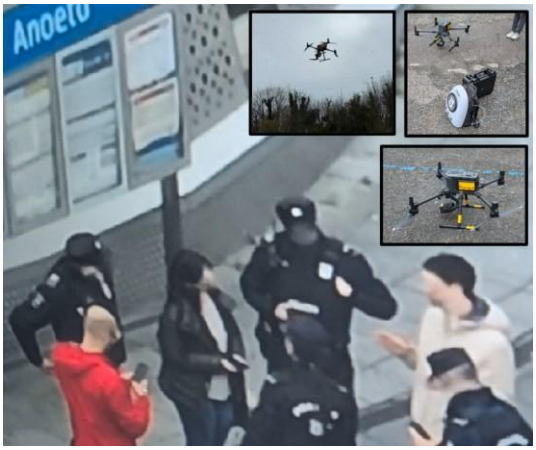


Figure 2 PPDR agent's feedback acquisition, captured from the drone during the final demonstration debrief

Figure 3 MC-SEAL call process followed from Emergency Management Room (Videowall set up from adjacent Command & Control Centre)

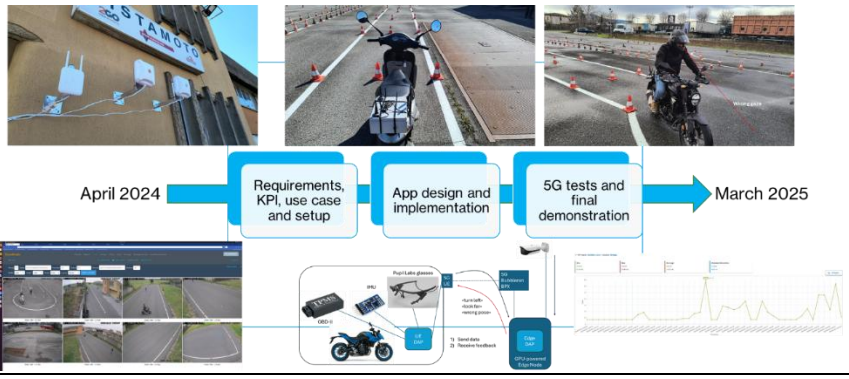
Vertical	Mission Critical Communications C Situational Awareness
Testbed	Victoria Network from University of Málaga (UMA)
Implementation timeframe	Project: May 2024 – May 2025 Trials: two cycles, Nov 7th – 13th Nov 24 and 7th – 10th Apr 25.

CORAL

OC Project Title	CORAL (Consortium of SMEs fOr 5G tRiALs)
Benefiaciary(s)/ Country	1) Infocom S.r.l./Italy 2) Darts Engineering S.r.l./Italy; 3) STAM S.r.l./Italy
Project Description	CORAL brought to FIDAL the integration of a further 5G Testing Facility in the FIDAL Architecture; Two vertical Use Cases: 1) An URLLC/eMBB (Ultra Reliable and Low Latency Communication / enhanced Mobile Broadband) use case, related to the remote-control of a robotic cell (employed for warehouse automation) through an Augmented Reality user interface, 2) An mMTC (massiveMachine Type Communication) use case, regarding the real-time monitoring of the hydro-meteorological risk in urban areas for an effective management of emergencies. The Use Case exploited a set of rainfall sensors deployed over a 150 km2 area in the outskirts of Genoa (Italy) and an innovative 5G NBIoT flood detector sensor. The CORAL 5G testing Facility was set-up in the SIIT's premise (Genoa, Italy). The CORAL Facility was integrated with the FIDAL architecture to: allow the deployment of CORAL use case applicative software over both the CORAL and other FIDAL test beds; enable FIDAL vertical orchestrator to access CORAL test bed resources and deploy Use Case applicative software; allow FIDAL Monitoring/Analytics Tool to gather performance data from the CORAL Infrastructure and Use Cases. **Results:** 1) Facility integration The CORAL Facility set up and its integration within the FIDAL architecture have been successfully completed. FIDAL Orchestration (Maestro/OpenSlice) and Monitoring/Analytics solutions have proven to be smoothly usable to manage extended testbeds and support decentralized trials. 2) Vertical Use Case testing All planned test cases were successfully executed. Use Cases trial outcomes provided the partners with a valuable assessment of the viability of the two applications and of the requirements for their deployment over a 5G-based infra-structures. 3) Dissemination The CORAL partners organized or participated in workshops and exhibitions, to directly and effectively involve prospects, customers and other stakeholders, and advertise the innovation and potentiality of the solutions developed in the scope of the project.

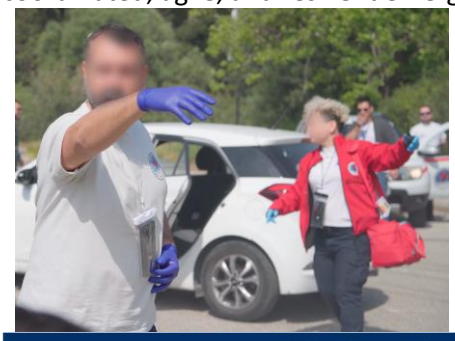
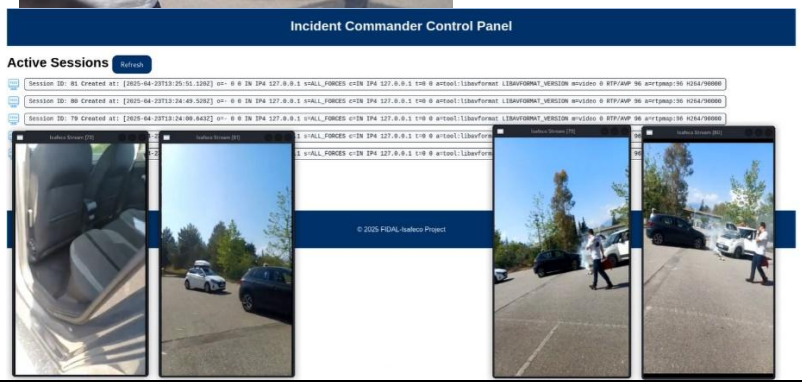
	 Figure 1 – Robot operator workstation – Operator equipped with VR headset to allow the 3D visualization of the robot working area  *Figure 1 – The robot, while performing precision pick-and-place tests*
Vertical	Time-critical applications
Testbed	The CORAL 5G testing Facility
Implementation timeframe	April 2024 – March 2025

5G-SDA

OC Project Title	5G-SDA (5GSmartDriveApp)
Beneficiary(s) / Country	1-Consorzio Nazionale Interuniversitario per le Telecomunicazioni (CNIT), RTO, Italy 2- AGDrive (AGD), SME, Italy
Project Description	The 5G-SmartDriveApp (5G-SDA) project investigates how 5G Standalone (SA) networks can enhance motorcycle rider training through real-time, data-driven methods. Its main innovation is the Driver Assistance Platform (DAP), which integrates IoT sensors, edge AI, 5G data streaming, and cloud analytics to objectively assess rider performance, detect mistakes, and provide instant feedback. Key features include a wearable sensor suite for tracking posture and gaze, the DriveAuditPro app for data fusion and feedback at the user and edge level, the BubbleRAN 5G SA network deployed and evaluated in a dedicated testbed, real-time monitoring and dataset generation via the AppArt analytics platform at FIDAL Patras. The goal is to automate traditional, manual motorcycle training by using a tightly integrated architecture that connects sensors, edge processing, and 5G infrastructure using AI. **Results**: The on-field tests demonstrated that the BubbleRAN Private 5G setup can reliably deliver low-latency and stable throughput, even under adverse weather conditions. Static tests with enhanced antennas confirmed a consistent round-trip latency of ~12 ms, with downlink performance improving significantly with higher transmission power. Heatmap analysis across different UE configurations identified optimal antenna setups and configurations that enhanced signal stability and throughput. The best-case setup achieved average downlink and uplink rates of 119 Mb/s and 56 Mb/s respectively. During demo sessions, the DAP system accurately detected rider errors such as improper gaze, wrong trajectories, and suboptimal acceleration by correlating data from gaze tracking, motion analysis, and telemetry. Continuous tests confirmed that video, gaze, and IMU data could be transmitted with stable throughput and ~5 ms latency, enabling responsive edge processing and feedback. The overall system latency (~25 ms) met AR/VR standards, supporting real-time feedback. The integrated inertial sensor setup also allowed accurate posture reconstruction. The project generated a dataset of telemetry, gaze, and behavioral data from motorbike sessions, accessible through the FIDAL portal. It includes both classified (executed by instructors) and unclassified (candidate) tests and is intended for real-time use, post-analysis, and AI model training. About dissemination, all the results will be presented at the ICTON2025 conference. 

	
Vertical	The project operates in the intelligent mobility and smart training vertical, focusing on enhancing motorcycle rider education and licensing through real-time, data-driven assessment. The DAP platform is a multi-layered tool that integrates wearable sensors, onboard data sources, and edge AI inference to monitor rider behavior. DAP delivers real-time feedback, streams data over 5G, and enables objective performance evaluation and automated exam support via edge-based analytics.
Testbed	The 5G-SDA was validated at the AG-DRIVE Pontedera track, specifically in its low-speed maneuvering area. The site includes eight Full HD cameras supported by WiFi7 access points and 5G antennas connected to the BubbleRAN platform and a Lanner Edge node with Internet connectivity to the FIDAL Patras testbed. The motorbikes, provided by AGD (Piaggio Liberty 50 for initial tests and Honda CB300 for official trials), were fitted with custom 3D-printed hard top box housing a Teltonika 5G UE with four antennas, mini-PCs running the DAP application, IMUs, and OBD-II modules.
Implementation timeframe	April 2024 – March 2025

ISAFECO

OC Project Title	Improved Situational Awareness for First Responders Complex Operations
Benefiaciary(s) / Country	Center for Security Studies, Greece Hellenic Rescue Team, Greece Hellenic Police, Greece
Project Description & Results	ISAFECO aggregates video intelligence from diverse sources, including Body-Worn Cameras, User Equipment from First Responders, and surveillance cameras. The incident commander can stream video feeds from various organisations to decision-makers, ensuring a Common Operational Picture (COP) from the incident site is available to all practitioners on the ground. The COP enables shared situational awareness among responding organisations, displaying personnel locations and available resources to support coordinated action. **Results & Impact:** The ISAFECO project significantly improves real-time situational awareness and coordination among First Responder (FR) organisations. By leveraging the FIDAL infrastructure and developed netApps, ISAFECO aggregates data, intelligence, and video streams from diverse on-site sources. A key outcome is the creation of a dynamic and unified Common Operational Picture that reflects the position, status, and deployment of both own and external FR personnel and assets. This enables each organisation to monitor and manage its resources effectively while maintaining visibility of other responding agencies at the incident scene. Through the real-time delivery of video and data, incident commanders from multiple FR agencies—such as police, fire and rescue, emergency medical services—make faster, better-informed decisions. ISAFECO strengthens inter-agency collaboration, reduces duplication of effort, and enhances operational efficiency and safety. By providing a shared, real-time view of complex and evolving incidents, ISAFECO supports a more coordinated, agile, and resilient emergency response.  
Vertical	First responders' operations for safety and security
Testbed	Patras5G/PNET network
Implementation timeframe	September 2024 – April 2025

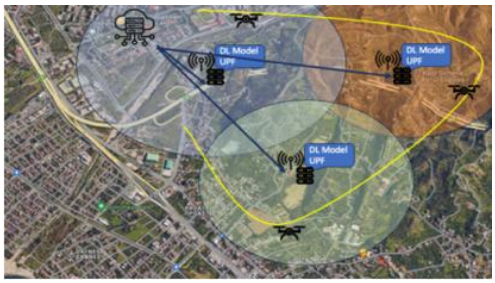
AI ARMORS

OC Project Title	**AI ARMORS (AI Assisted V2X time cRitical coMmunicatiOns for enhanced Road Safety)**
Benefiaciary(s)/Country	University of Thessaly/Greece
Project Description & Results	We study, develop, set-up and carry out experiments related to V2X (Vehicle-to-Everything) communications for road safety use case by enabling the involved stakeholders in road traffic environments to communicate and synchronize so as to avoid accidents or manage them in the best possible way using on site information from high-end 5G smartphones that act as on-board units (OBUs) for vehicles.  **Results:** The project has achieved its goals and the test and trials show big potential for the specific use case. In particular the AI ARMORS system: a) Continuously monitors for events that may correspond to an accident through the sensors of the subjects located at the road and from cameras. b) automatically broadcasts real time alerts to the stakeholders within a certain radius from the incident so that only the really affected ones are warned without creating any widespread panic situations that may lead to more adverse consequences. c) notifies public safety bodies and first responders only when the event has been confirmed that it really corresponds to a real accident. d) simple and intuitive user interfaces were adopted for the applications. Performance evaluations regarding detection times and accuracy of the adopted computer vision model as well as regarding latency over a private 5G SA, public 5G NSA and WiFi infrastructures show close to target KPIs. Finally live demonstration at WCNC 2025 received very positive feedback and a KVI for road safety is under development.
Vertical	PPDR
Testbed	Patras5G/PNET
Implementation timeframe	April 2024 -June 2025

AI-HOLOCOM

OC Project Title	AI-HOLOCOM
Benefiaciary(s) / Country	Vicomtech / Spain
Project Description & Results	The AI-HOLOCOM (Affordable and Immersive Holographic Communication service) project advanced web-based volumetric video streaming by developing a 5G-ready platform optimized for real-time delivery. It aimed to provide affordable, portable, and accessible holographic experiences, leveraging beyond 5G networks to overcome technical limitations. The project has focused on solving challenges in content production, distribution, and consumption while validating its feasibility through a demonstrator. **Results:** 1) Development and Integration: During the project we developed a volumetric video capturing, processing, distribution and rendering platform with three main characteristics: technologically mature, web-ready and 5G-ready. This platform was successfully tested over Telenors's LTS facility in the two experiments carried out during the project. 2) Dissemination: we attended the 4K-HDR SUMMIT event in Sevilla in November 2024. We presented a long paper to Web3D2024 conference (Best paper award). We will attend the EuCNC 2025 conference.
Vertical	Media & Entertainment
Testbed	AI-HOLOCOM was designed to be deployed on top of the Telenor LST facility
Implementation timeframe	April 2024 – March 2025

DADOLTI

OC Project Title	Drone-based Automated Distribution Overhead Lines and Towers Inspection through 5G-enabled hierarchical inference in the drone-captured video feed
Benefiaciary(s)/Country	PROBOTEK / Greece
Project Description & Results	**DADOLTI** uses AI and Hierarchical Inference (HI) to offer an online drone-based inspection service. In HI, a lightweight model runs on the drone, while a full deep learning (DL) model is hosted on a server as backup when the drone's model produces low-confidence results. To minimize latency, DADOLTI selects servers close to the drone, leveraging the drone's known trajectory and the decentralized 5G architecture. Since drones operate across areas served by different gNBs, fixed server selection isn't optimal. Instead, MEC servers near the gNBs host both the full DL models and UPF instances, ensuring low-latency and efficient communication.  **Results**: The DADOLTI project successfully demonstrated a robust integration of edge AI, drone-based inspection, and 5G connectivity to modernize electrical infrastructure monitoring. The use of Open5GS and OpenStack allowed seamless deployment of UPF and co-located inference services at the edge for local breakout, minimizing latency and communication with the cloud.
Vertical	Public Protection and Disaster Relief (PPDR)
Testbed	Patras5G/PNET
Implementation timeframe	April 2024 – March 2025

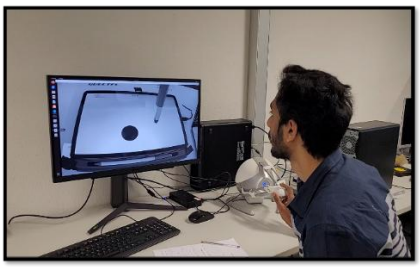
MBBPT

OC Project Title	Magos Bakri Balloon Placement Training (MBBPT)
Benefiaciary(s)/ Country	Quanta & Qualia / Greece University College Dublin (UCD) / Ireland
Project Description & Results	MBBPT introduces a next-generation VR surgical training application integrating Haptikos exoskeletons for realistic haptic feedback and submillimetre hand tracking. The project simulates the Bakri balloon placement procedure in obstetrics and enables remote, real-time collaboration between trainee and instructor over 5G network. The solution enhances procedural accuracy and confidence by combining experiential learning, tactile realism, and remote support.  **Results**: The Magos Bakri Balloon Placement Training (MBBPT) was successfully integrated into the FIDAL architecture, with real-time performance reporting (e.g., frame rate, CPU/GPU metrics). UCD developed and optimized its 5G Open RAN testbed to enable multiplayer, low-latency, haptic-enabled VR training. Two formal trial rounds were held at the National Maternity Hospital, Dublin (Dec 2024, Apr 2025), involving UCD medical students and NCHDs. The system supported submillimetre hand tracking and lifelike haptic feedback using Magos gloves. 58 users participated in structured simulation, with over 100 additional users engaged in pilot demonstrations. 94.74% of users rated the experience positively. Participants reported a significant increase in confidence (mean score rose from 1.78 to 2.97, $p<0.05$). Users highlighted realism, skill development, and ease of use. Minor issues included occasional VR-induced dizziness (45%) and requests for richer anatomical detail. Live system metrics and session data were reported through the FIDAL Monitoring & Analytics platform. The multiplayer setup enabled real-time collaboration between remote learners and instructors. The VR setup was fully compatible with Meta Quest 2 & 3 and calibrated across devices. UCD's infrastructure proved robust for cross-site, real-time simulation via secure VPN. MBBPT reduced dependence on live clinical exposure for rare emergency procedures. It offers a reusable, scalable, and low-risk model for training in obstetric emergencies. The project supports global access to high-fidelity, digitally enabled surgical education.
Vertical	Healthcare / Medical Simulation & Training
Testbed	UCD 5G Testbed (Ireland) Patras University 5G Testbed (Greece)
Implementation timeframe	May 2024 – April 2025

RescueSync

OC Project Title	RescueSync
Benefiaciary(s)/Country	INTELLIA/Greece
Project Description & Results	In an era where technology is reshaping the contours of communication, RescueSync envisions revolutionizing emergency response and Public Protection and Disaster Relief (PPDR) coordination through the power of Augmented Reality (AR). By leveraging the capabilities of Beyond 5G, RescueSync provides a seamless, real-time, and immersive communication platform that bridges the gap between on-site field officers and Command and Control (C2) operators. This enhances the efficiency of emergency services but also ensures the safety and security of both the public and the officers involved. While aligning with FIDAL's objectives, RescueSync seeked to contribute to Europe's technological leadership in the realm of communication technologies. RescueSync performed multiple trials (e.g., live video streams, video calls, voice data, real-time operational/mission-critical data such as location instant messages) imposing certain requirements that include faster speed, low network latency and increased bandwidth. **Results**: The main outcomes of the RescueSync internal tests include valuable insights into system optimization, interoperability and durability across the system's hardware components. The internal tests confirmed the system's ability to achieve low- latency communication by optimizing message bus configurations and caching mechanisms, ensuring efficient data flow critical and highlighting the necessity of optimizing both software and network configurations to meet stringent latency requirements. Moreover, internal testing revealed useful insights into real-time communication, system robustness, and infrastructure requirements, essential for emergency response applications. An important takeaway was the strong performance of the AR glasses (both monocular and binocular) under demanding real-time 5G conditions. Both devices maintained stable connectivity throughout the trials, supported continuous 4K video streaming, and operated for extended periods without overheating or battery depletion. These results confirm that smart AR glasses, when paired with a reliable 5G infrastructure, can serve as robust tools for mission-critical operations in emergency response scenarios. User feedback collected through questionnaires during the final trials provided valuable insights into system usability and perceived value. Field officers and remote experts consistently rated the RescueSync system as easy to use, with high scores for intuitive interaction and minimal training requirements. Responders emphasized that the system's voice command support, live video streaming, and interactive task assignment capabilities improved operational efficiency and decision-making in the field. These findings validate the system's user-centric design approach and highlight the added value RescueSync brings to PPDR operations.
Vertical	PPDR
Testbed	University of MALAGA Testbed
Implementation timeframe	1/4/2024-31/3/2025

TIFI

OC Project Title	TIFI: Tactile Internet Fidelity over FIDAL for Bilateral Teleoperation
Benefiaciary(s)/Country	Eindhoven University of Technology (Lead) – The Netherlands Delft University of Technology (Partner)- The Netherlands
Project Description & Results	Bilateral teleoperation is the process of efficiently carrying out the operator's action in a smooth, secured fashion at a remote end, for example, operating a remote robotic device using a haptic device. Through TiFi, we aim to combine the best capabilities/features that the next generation wireless network (5G and beyond) can offer along with the digital twin at the local operator end to achieve high tactile internet (TI) fidelity, i.e. to make TI-enabled teleoperation over long distances a reality.  Operator at TU Eindhoven  Robot at Patras university **Results**: The TIFI FIDAL teleoperation experiments have successfully demonstrated the feasibility of high-fidelity bilateral teleoperation over contemporary 5G networks across significant distances. The trials between TU Eindhoven and Patras University, spanning approximately 2000km, validated that dexterous tasks can be executed reliably over long-distance public internet connections when combined with predictive force feedback and optimized low-latency video streaming
Vertical	Time critical applications and services
Testbed	University of Patras - Greece
Implementation timeframe	June 2024 – May 2025

B5G-MOBITRUST

OC Project Title	B5G-MOBITRUST
Beneficiary(s)/Country	ONESOURCE, Consultoria Informática Lda. / Portugal
Project Description & Results	The B5G-MOBITRUST project enhances public safety at large-scale events by integrating the MOBITRUST platform with 5G/B5G technologies. Conducted with the Málaga Police, it deploys edge computing, drones, wearables, and AR/VR tools to support real-time situational awareness and communication for first responders. One of the project's core objectives was the extension of the Málaga testbed through the deployment of a Mobile Command and Control Centre (Mobile CCC), a police vehicle fully equipped with edge capabilities, sensors, and real-time coordination tools. Trials across five major events in Málaga validated disaster response readiness, crowd management effectiveness, and secure data sharing using the FIDAL Málaga testbed infrastructure. **Results**: The B5G-MOBITRUST project has clearly demonstrated the transformative potential of B5G technologies in strengthening public safety and emergency response capabilities. In collaboration with the Málaga Local Police, the project carried out five large-scale field trials during high-density public events, enabling real-world validation of the platform under operational stress. Across these deployments, over 100 police officers were trained and actively engaged using cutting-edge tools such as drones, body-worn cameras, AR/VR interfaces, and biometric wearables. Collectively, the system contributed to safeguarding more than one million citizens, offering timely, data-driven situational awareness and response coordination. A key outcome was the successful deployment of a Mobile CCC, a fully equipped police vehicle that brought real-time decision-making capabilities directly to the field. This mobile hub integrated 5G Standalone connectivity, edge computing, and sensor fusion, empowering responders with accurate and immediate information during fast-evolving scenarios.  The platform ensured reliable, low-latency video streaming and data sharing even under heavy network load, thanks to mechanisms such as network slicing and QoS prioritisation. These capabilities proved essential for maintaining communication stability in moments of high demand, such as during parades, concerts, and city-wide festivals. Beyond the technical validation, the project generated substantial operational and societal impact. It improved response times, enhanced collaboration between agencies, and provided actionable insights for future public safety strategies.
Vertical	Public Protection and Disaster Response (PPDR)
Testbed	FIDAL Málaga testbed
Implementation timeframe	12 Months (01/04/2024 - 31/03/2025)

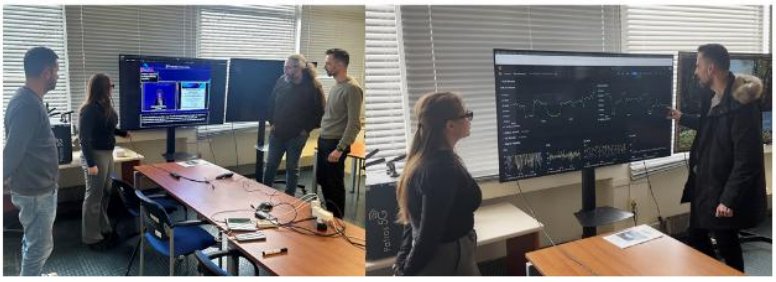
E5GForTCA

OC Project Title	Enterprise 5G for Time Critical Applications (E5GForTCA)
Benefiaciary(s)/Country	FINLAND, NORWAY, SPAIN
Project Description & Results	Enterprise 5G for Time Critical Applications (E5GForTCA) will enhance the capabilities of the Norwegian Facility within the FIDAL initiative by undertaking the deployment and field testing of programmable, fully automated private 5G networks for Time Critical Applications. 1. A truly micro-service based 5GCore tailored for Time critical use cases. The 5GCore will have features such as TSN, 5GLAN and support 2. The life-cycle management of the 5GCore platform will be performed by the existing orchestration solutions (NCOM and NORC from Nokia) in Norway facility of FIDAL 3. A key tenant of E5GforTCA is to make the network API via the Network Exposure function (NEF). 4. The 5G small cells (indoor and outdoor) which E5GForTCA will deploy will be based on the latest 3GPP release and cater for 5GLAN, TSN, Network slicing and positioning. 5. The management E5GforTCA system is poised to embrace a "single pane of glass" approach- 6. E5GForTCA open architecture where the KPIs and KVIs will be integrated to Norwegian facility of FIDAL. 7. Kongsberg Maritime (KM) and Norwegian Defense Material Agency (NDMA) have agreed to host the field trials. 8. Validate the performance of 5G-based positioning and leverage the sandbox environment in UniOfBurgos **Results:** The project successfully completed all the tasks defined in the project plan and exceeded with the trials both in customer premises at Kongsberg and UBU lab. Moreover, integration with FIDAL platform was also completed and the results of the customer trials were uploaded to FIDAL data repository.
Vertical	Industrial and critical communications
Testbed	Norwegian Facility within the FIDAL
Implementation timeframe	March 2024-May 2025

SwarmCatcher

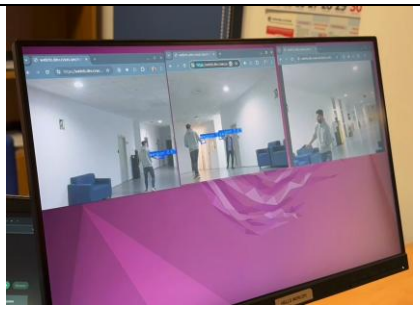
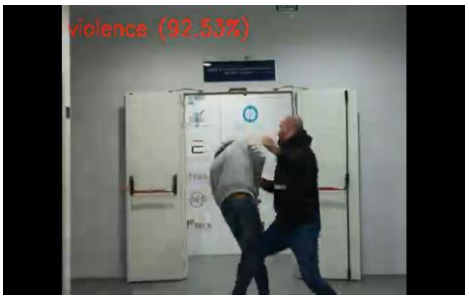
OC Project Title	SwarmCatcher – AI-powered Anti-Drone and Surveillance Experimental Infrastructure over Cloud-native 5G and Beyond Networks
Benefiaciary(s) / Country	1) CERTH: Centre for Research and Technology-Hellas (CERTH)/ Information Technologies Institute (ITI)/ Greece 2) KIBO Cabins/ Greece
Project Description & Results	SwarmCatcher is an AI-powered anti-drone and surveillance system developed within the FIDAL project, designed to enhance security and public safety by leveraging cloud-native 5G networks. The system integrates optical, thermal, radar, RF, and acoustic sensors with advanced AI/ML-driven analytics for real-time identification, localization, and tracking of threats—including UAV incursions and environmental anomalies. It enables automated threat response and situational awareness for law enforcement and emergency responders, supporting critical infrastructure protection and environmental monitoring. **Results:** • Successful trials across CERTH and FIDAL testbeds validated SwarmCatcher's real-time detection, tracking, and multi-sensor data fusion over commercial and research 5G networks. • Key KVIs & KPIs: high user satisfaction (>86% for safety, trust, and accessibility), robust multi-sensor integration, and real-time threat detection with low-latency response. • Supported law enforcement, fire, and emergency response teams with hands-on trials and user feedback. • Demonstrated scalability, modularity, and operational reliability for critical infrastructure and public safety scenarios. • Identified areas for future improvement (e.g., privacy transparency, further optimization of latency and throughput). • Ready for real-world deployments and ongoing enhancements.
Vertical	Public Safety, Critical Infrastructure Protection, Environmental Surveillance
Testbed	CERTH Testbed (Greece) FIDAL 5G Testbed at University of Patras (Greece)
Implementation timeframe	• 12 months (1/4/2024-31/3/2025)

VideoGee

OC Project Title	VideoGee - Personalized VIDEO summarization over 5G
Benefiaciary(s)/Country	INVENTICS S.A (INV) / Hellas
Project Description & Results	The proposed use case focuses on enhancing media streaming services for organized events such as scientific conferences, corporate meetings, live interviews, thematic workshops, and training seminars. The project, titled VideoGee, aims to assess and demonstrate the added value of integrating key enabling technologies, such as 5G, Artificial Intelligence (AI), and Augmented Reality (AR) to improve video analysis and enrich the user experience. These technologies will be deployed and validated through real-world trials conducted at the Patras5G/p-NET testbed, providing a controlled environment to explore their potential impact on the quality, interactivity, and efficiency of event-based media streaming.  **Results:** The experimental evaluation on the Patras5G/p-NET testbed confirmed that the system performs effectively under 5G conditions, enabling real-time video processing and streaming with minimal latency. The system successfully handled real-time video processing and streaming with minimal latency, confirming its efficiency in a 5G network environment. Monitoring tools offered valuable insights into network performance and system behavior. Key performance and value indicators (KPIs/KVIs) such as processing speed, latency, and accuracy met expectations. The system reliably handled tasks like real-time speech processing and text extraction from video, demonstrating strong scalability and readiness for real-world deployment.
Vertical	Media & Entertainment
Testbed	5G testbed of Patras5G/p-NET facility
Implementation timeframe	1/4/2024 - 31/3/2025

SecureEye

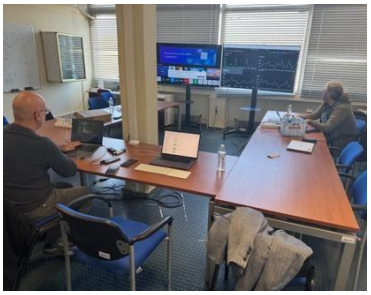
OC Project Title	SecurEye StreamSense: On-Demand AI for Real-Time Video Security
Benefiaciary(s)/ Country	Secmotic Innovation S.L. / Spain
Project Description	The SecurEye project has been developed within the framework of the FIDAL initiative as a technological response to the growing challenges in the field of urban security, situational awareness and emergency management. It focuses on enabling real-time video analytics through artificial intelligence and advanced 5G connectivity, providing security operators and emergency teams with actionable information derived from automated video analytics. The aim is to detect and classify incidents such as violent behaviour, the presence of weapons, health emergencies, abandoned objects or fire and smoke, with high precision and low latency, improving the ability of public safety services to act quickly and effectively. **Results**: Among the main results and impact of the SecurEye sub-project, the following are worth highlighting: - Technical and operational validation in real environments: After completing more than 12 months of development and testing, SecurEye was deployed in the VICTORIA testbed at the University of Malaga, using a private 5G SA network. Stable transmission rates (~94 Mbps average bandwidth) and average latencies of ≈15 ms were achieved, ensuring real-time video capability without significant losses. - Development and integration of five computer vision models: Models based on variants of YOLO (v5/v7/v8) and ConvLSTM were designed, trained and optimised to detect violence, weapons, falls, smoke/fire and abandoned objects. In field tests, all models achieved over 80% accuracy, with response times of less than 1 minute for alert generation. - Modular, plug-and-play hybrid edge-cloud architecture: The solution combines edge nodes (smart 5G cameras with CPU processing) and a Kubernetes cluster in the cloud, connected by VPN. The on-demand mechanism allows models to be dynamically assigned to video streams, optimising resource usage and ensuring scalability and compatibility with existing infrastructures. - Impact on security operations and resource savings: The automation of early incident detection—accompanied by pre- and post-event video clips—has reduced the burden of continuous monitoring by security personnel. In addition, rapid alert generation improves emergency response capabilities, optimising human resource allocation and increasing stakeholder confidence.

	     
Vertical	PPDR
Testbed	VICTORIA testbed platform.
Implementation timeframe	April 2024 – March 2025

EFFECT

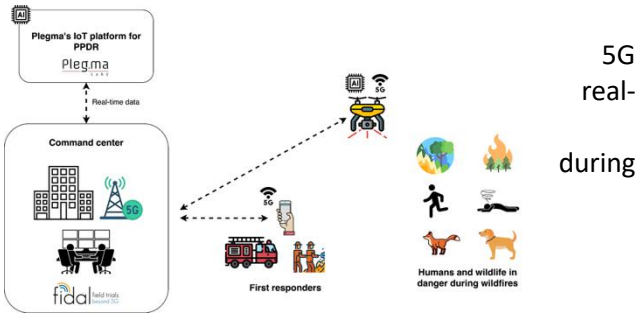
OC Project Title	OC16 - EFFECT: "EFFECTive fire early detection and monitoring system based on in-situ sensors".
Benefiaciary(s)/Country	WEBGENESYS S.P.A./Italy
Project Description	The EFFECT project develops a real-time fire detection system for agriculture using low-power IoT sensors connected via LoRaWAN and 5G+. It enables early alerts by monitoring environmental data such as temperature, humidity, and particulate matter, ensuring reliable, low-latency communication for rapid response in remote areas.
Vertical	EFFECT addresses a vertical use case in the **environmental risk management** domain, where early detection of wildfires is critical to protecting high-value crops and ecosystems. By leveraging 5G+, EFFECT demonstrates how this vertical solution can benefit from **ultra-reliable and low-latency communication** (URLLC), ensuring timely alert delivery. Furthermore, it shows how 5G infrastructure can **extend beyond human-centric broadband applications** to support **IoT solutions** at scale, fostering early detection capabilities in rural zones that typically lack robust connectivity. **Results:** The EFFECT project demonstrated the viability of integrating a low-power IoT sensors and gateways network with 5G+ connectivity for early fire detection in agricultural and forestry environments. Field trials at the La Mayora experimental site confirmed ultra-reliable, low-latency communication between sensors, gateways, and cloud platforms, achieving average latency values as low as 5.3 ms and zero packet loss under test conditions. The system effectively identified anomalies, including sensor failures, and triggered alerts during simulated fire events. These results validate the robustness of the architecture and highlight its applicability in other critical domains such as infrastructure monitoring, environmental risk management, and smart agriculture. By showcasing 5G+ as a backbone for distributed sensing, EFFECT contributes to accelerating the adoption of real-time IoT solutions in critical environments.
Vertical	PPDR
Testbed	VICTORIA 5G experimental infrastructure.
Implementation timeframe	July 2024 - April 2025

EVEARA

OC Project Title	5G EVEARA LiveStream and 5G EVEARA Music Co-Creation
Benefiaciary(s) / Country	EVEARA Ltd. (Ireland)
Project Description & Results	The sub-project explored two use cases: (1) high-fidelity audio livestreaming over 5G, and (2) real-time remote music co-creation. Both use cases leveraged advanced 5G network features to ensure low latency, high throughput, and strong scalability. The trials demonstrated that 5G enables both seamless music distribution and collaborative production across distances.     **Results:** The project successfully demonstrated the transformative impact of 5G in the music and audio sector. By executing a series of controlled lab- and real-world experiments we validated that 5G enables professional-grade audio experiences with high reliability and quality. Notably, we performed a load test simulating 10,000 concurrent users, confirming the scalability and robustness of the tested 5G infrastructure under realistic and demanding conditions. These results provide compelling evidence that 5G can support new digital formats in the music industry, such as real-time interactive concerts, remote studio sessions, and distributed music events. This unlocks significant opportunities for creative collaboration, audience reach, and new business models. The outcomes align with the strategic goals of the SNS JU, showcasing the viability of advanced 5G capabilities for vertical-specific applications and supporting Europe's leadership in next-generation connectivity.
Vertical	Media / Entertainment / Music Industry
Testbed	Patras5G (University of Patras), Greece
Implementation timeframe	April 2024 – March 2025

OPEN CALL 2

WOLF

OC Project Title	**WOLF - Wildlife and civilian Observation & Life-saving Framework integrating 5G-enabled UAVs**
Beneficiary	Plegma Labs S.A., Greece
Project Description and achievements	WOLF leverages UAVs integrated within FIDAL's 5G infrastructure, to provide real-time detection of humans and wildlife during hazardous wildfire situations using computer vision AI models, enhancing FIDAL's digital twin system.  Drones stream data in real time through FIDAL's 5G network to the command center and PLEGMA's IoT platform. PLEGMA's platform uses AI models to detect humans and wildlife in danger, while first responders will be alerted via mobile phones connected to the 5G network regarding such detections to act promptly. **Project objectives & implementation plan**: 1. Offer an AI-enabled PPDR solution for human & wildlife rescuing. 2. Integrate new UAV devices within FIDAL's digital twin ecosystem. 3. Leverage 5G infrastructure for real-time communication. 4. Provide automated risk assessment and real-time alerts. 5. Validate & demonstrate the solution in large-scale field trial.. Achievements so far: requirements, architecture, initial developments, visit at Patras for initial integration and tests.
Next steps	• WP3 activities, including the development of the system components and integration, which will lead to D3.1: Description of the AI PPDR system components and D3.2: 5G evolved features • WP4 activities, regarding the Trial demonstration and KPI assessment, which will result to D4.1: Key Performance Indicators, including measured data, D4.2: Key Value Indicators, including data and applied metrics, and D4.3: Lessons learnt. • The final trial demonstration will evaluate the WOLF system at the Patras5G/PNET testbed. The 5G infrastructure of the GR trial will be utilized for the deployment of the system, collecting real-time data from drones/cameras and providing alerts.
Vertical	Emergency Services, Public Protection and Disaster Relief (PPDR)
Testbed	Patras5G/PNET
Implementation Timeframe	May 2025 – January 2026

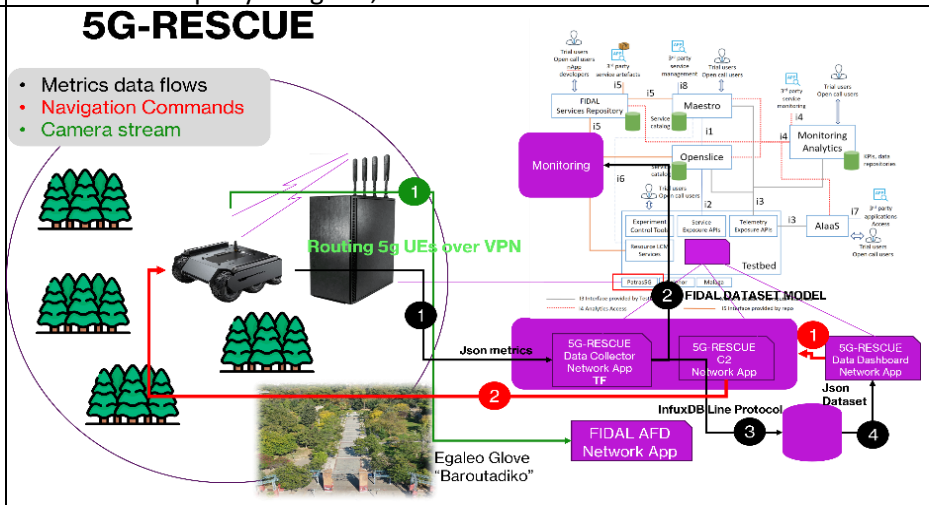
ReDrone5G

OC Project Title	Real-Time Remote Drone Control with Low-Latency Video Streaming over 5G for Media and Entertainment Applications
Beneficiary(-ies)	• NTNU, Norway • Ada Guzey Engineering, Turkey
Project Description and achievements	Both teams from NTNU and Ada Guzey have completed the works following the Phase 1 (Project Initiation and Planning M1-2) and Phase 2 (Hardware Procurement and Integration M2-3). We have already been working on Phase 3 (Software Development M3-5) as well as Phase 4 (Network Configuration and Optimization M4-5). Specifically, following items can be briefly reported: **For NTNU:** **Objectives:** • Development of 5G UE Drone that can support HD media and control functionality (M1-3: System development and integration). • Design of private 5G network to test the performance of Drone UE • Testing in different private and public networks for comparison of public and private 5G network performance (M4-5: Testing and Optimization) **Work in Progress:** • Testing, performance evaluation and optimization of the private 5G solution • Integration and configuration of drone UE in the network • Testing different scenarios to cover various aspects of the selected vertical **For Ada Guzey Engineering:** **Objectives:** • To demonstrate 5G-ready drone platform delivering **low-latency HD video** and reliable telemetry for remote piloting and research. • Provide a reproducible edge streaming pipeline (WebRTC/WHEP) and dashboards for NTNU B5G testbed use. **Work in Progress:** • D4 6S/prop efficiency C PID tuning report (PLANNED) • D5 Secure edge-integration C WAN trial report (PLANNED) • D6 Final demo + dataset + lessons learned (PLANNED)
Next steps	• Continue the work in progress (both partners) • Prepare for testing, demonstration and reports
Vertical	Broadband Media and Latency Critical Remote Control
Testbed	NTNU B5G Lab

DARK 5G

OC Project Title	Enhancing Underground Emergency Response with Portable 5G SA Mobile Device Detecting Sensor And 5G Leaky Cable System
Beneficiary(-ies)	• Rinicom, England • i46, Czech Republic
Project Description and achievements	**Achievements** Rinicom and i46 have integrated the DARK-5G "5G-in-a-box" system with the FIDAL platform to enable resilient, secure, and real-time communications in underground emergency scenarios. The deliverable includes the system's architecture—including the portable 5G core, srsRAN base stations with leaky cable technology, video wall, WiFi detectors, and access points—and illustrate how these components were validated in lab and tunnel testbeds. The FIDAL dashboard is also deployed and aims to centralize the monitoring of key performance indicators (KPIs), device detection, and network health. • D5 - UE Detection This deliverable presents methodologies for detecting mobile devices in dark or low-visibility environments by leveraging Wi-Fi–based sensing in conjunction with 5G network data. Laboratory experiments were conducted to validate detection capabilities for both Android and iOS devices, utilizing hotspot signals, connections via the 5G core, and probing messages under controlled conditions. The results indicate variable detection reliability across different device models, underscoring both the potential and the limitations of Wi-Fi and 5G–based user detection in the context of emergency response scenarios. • D6 - Performance in Lab Deliverable 6 focuses exclusively on the assessment of technical Key Performance Indicators (KPIs). The laboratory validation activities carried out by Rinicom and i46 demonstrated strong system performance, including near-zero packet loss, device detection accuracy above 99%, downlink and uplink data rates of 178 Mbps and 83 Mbps respectively, system setup in under 10 minutes, full end-to-end encryption, and rapid detection of trapped individuals within 10 seconds. Certain limitations were observed, notably an average latency of ~28 ms (exceeding the <20 ms target) and variability in leaky cable performance depending on configuration. Comprehensive validation under real tunnel conditions is planned for the upcoming pilot phase.
Next steps	• Continue the work in progress (both partners) • Prepare for testing, demonstration and reports
Vertical	PPDR
Testbed	Patras 5G Testbed

5G-Rescue

OC Project Title	5G-enabled Rescue and Surveillance UGV with far-edge capabilities based on Commodity Hardware
Beneficiary(-ies)	• INFOLYSIS PC, Greece • QUANTOS SA STATISTICS AND INFORMATION SYSTEMS, Greece • Municipality of Aigaleo, Greece
Project Description and achievements	 The project is about developing and demonstrating a low-cost 5G-enabled unmanned ground vehicle (UGV) to support emergency and civil protection missions. Built with commodity hardware and open-source software, the UGV integrates sensors, a camera, and 5G connectivity to collect and transmit real-time data, while cloud-based services provide monitoring, control, and AI-assisted decision support. Thus, it showcases how advanced 5G capabilities can be made accessible to local authorities such as municipal police and civil protection teams. **UGV Development**: Assembled a Raspberry Pi–based UGV with sensors, camera, distance detection, 5G connectivity, and a Python application for navigation, obstacle avoidance, metric collection, and API exposure. **5G Connectivity**: Deployed Open5GS core on Raspberry Pi + BaiCells RAN, validated end- to-end with UGV (Quectel modem). **Cloud Integration**: Kubernetes services for data collection, navigation control, and real- time R Shiny dashboard. **Networking**: VPN overlay connecting UGV and cloud services, enabling secure flow of metrics, navigation commands, and camera stream. **Validation**: Initial lab tests completed; site visit with Egaleo municipality for planning/preparing final deployment.
Next steps	• Deploy portable 5G at Egaleo, connect via VPN to Patras testbed. • Demonstrate end-to-end UGV functions: sensing, navigation, monitoring, camera streaming. • Collect feedback from municipal police and civil protection teams. • Integrate AI-based fire detection app into Patras cluster for final demonstration.
Vertical	Emergency Services
Testbed	Patras 5G testbed

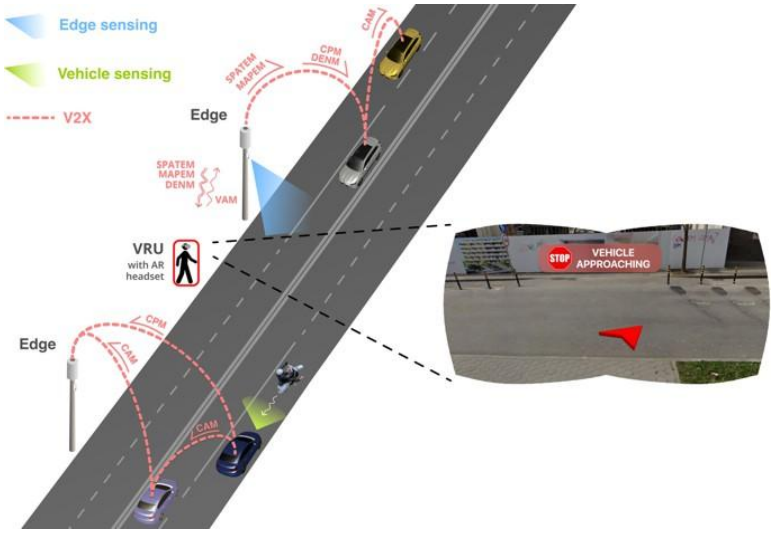
5G4ZDM

OC Project Title	5G for zero-defect manufacturing in battery aesthetic defects
Beneficiaries	• TF-CC, Greece • APTIV, Italy • CASP, Greece
Project Description and achievements	**Project description:** The 5G4ZDM project aims to improve defect detection in EV battery manufacturing by introducing an innovative network-based computer vision solution powered by 5G technology. Through FIDAL's 5G infrastructure, the solution is expected to deliver reliable, low-latency communication and high data throughput, essential for real-time inspection in time-sensitive manufacturing processes. **Project objectives:** • Development of a custom ViT-based battery welding defect identification system • Development of an IoT platform and expansion of IoT cameras' capabilities • Scalability Testing in a Controlled 5G Environment and validation in an industrial environment **Achievements:** • Develop a custom ViT-based battery welding defect identification system. • Develop the IoT platform. • Deploy a functional 5G Core Network. • Deploy a gateway component integrating the cameras and the connection gateway for the 5G network. • Deploy the TF-CC testbed aligned with APTIV's production line.
Next steps	**Next steps:** • Integrate all testbed components and verify that the solution works as expected. • Extract metrics for the performance of the solution. • Run the experiment and save the metrics to FIDAL monitoring analytics. • Deploy the solution on the Patras testbed. • Collect metrics from the Patras testbed. • Compare the two solutions and draw conclusions.
Vertical	Emergency Services / Manufacturing
Testbed	Patras5G Testbed, TF-CC

HOLOFID

OC Project Title	Large-Scale Holo-Portation Trials over Federated FIDAL Testbeds
Beneficiaries)	• I2CAT Foundation • Brainstorm
Project Description and achievements	Phase 1 Tech Adaptation C Deployment - Adaptation of HoloMIT (i2CAT) and InfinitySet (Brainstorm) platforms, and integration - Deployment and integration of Network-as-a- Service (NaaS) APIs - Virtual scenario creation and - Recording of content (performers, virtual audience fans) Phase 2 – (M3-M6) Objective Testing within i2CAT testbed - Stability tests within certain limits in terms of participants (e.g. 1 performer + 3 fans)
Next steps	Phase 2 – Objective Testing within i2CAT testbed - [Ongoing] Scalability limits tests - [Planned] Scalability limits tests - [Planned] Rate Adaptation for fans' holograms to increase stability / scalability via Congestion Detection API - [Planned] Prioritization / protection of performers' stream via Quality-on-Deman (QoD) API Phase 3 Objective Testing between federated testbeds - [Planned] Benchmark connectivity between testbeds (bandwidth capacity, stability…) - [Planned] Deploy specific components at Telenor testbed (comm server, clients with pre-recorded holograms) - [Planned] Perform tests across testbed, with different configurations Phase 4 – (M8-MX? Subjective Testing at i2CAT and Telenor testbed - [Planned] Live demos to end users and stakeholders, and Quality of Experience (QoE) tests
Vertical	Media – Networked Music Performances / Events in VR
Testbed	Phase 1: I2CAT Testbed; Phase 2: Telenor testbed (+i2CAT)

SafeXCity

OC Project Title	SafeXCity
Beneficiary(-ies)	Instituto de Telecomunicações (IT), Portugal, Instituto Pedro Nunes (IPN), Portugal
Project Description and achievements	The project explores how Vulnerable Road Users (VRUs), such as pedestrians or cyclists, can safely interact with connected vehicles and smart city infrastructure using an Augmented Reality (AR) headset. The headset not only provides VRUs with real-time hazard warnings through V2X communication but also acts as a sensing hub that can feed information back into the system. Two scenarios are considered: 1) communication between vehicles, infrastructure, and VRUs; 2) direct interaction between VRUs and Autonomous Vehicles (AVs).  The use case addresses bidirectional interaction between AVs and VRUs through AR applications and speech interfaces. An ITS-G5- enabled compute device processes vehicular messages, while the AR headset displays real-time notifications to improve safety and reduce pedestrian workload. Beyond visual feedback, speech interaction enables VRUs to issue natural voice commands, which are captured by the headset, processed via 5G edge connectivity. The use case will be evaluated in the Aveiro Living Lab. Until now, the main achievements are the development of the applications and services for AR/VR to be used in the HoloLens glasses, and all the edge services responsible for the support and assistant of the V2X and VRU, and between VRUs and AVs. KPIs: 5G throughput, 5G Coverage, 5G Slices, Perception Service Latency, 5G Latency, Services and Devices Clock Drift, mAP50-95, Service Availability, Service Reliability, Location Accuracy, Trusted Entity Ratio Deliverable names: D1 Implementation and Execution Plan, Architecture
Next steps	Integration with FIDAL's Malaga testbed (Monitoring and Analytics Platform, MAESTRO)
Vertical	Smart City / Automotive
Testbed	Aveiro Living Lab, Portugal

5G-SHIELD

OC Project Title	5G Secure High-Precision Localization and Dynamic Safety Testbed
Beneficiary(-ies)	SMA-RTY ITALIA SRL (Italy), ITALTEL SPA (Italy), MADE 4.0 (Italy)
Project Description and achievements	**Project Objectives:** The main objective of 5G-SHIELD is to implement a "presence awareness" concept in an Industry 4.0 environment to ensure the safety of workers collaborating with Automated Guided Vehicles (AGVs). The project aims to create a "time-aware" and "position-aware" testbed by leveraging a private 5G network. **Implementation plan and results:** The success of the architecture is based on the integration of three key technologies: • Ultra-Reliable Low-Latency Communication (URLLC) via millimeter-wave (mmWave) spectrum. • High-precision 5G positioning, obtained from the fusion of radio signals and machine vision data. • Edge computing for local data processing and AI-based analysis. The system architecture is composed of three levels: • Network Infrastructure: A private 5G network with a Radio Access Network (RAN) operating on mmWave spectrum (FR2) to enable the Joint Communication and Sensing (JCAS) paradigm. A local Core Network (CN) is installed to manage the network and ensure rapid communications. • Edge Computing Platform: It acts as a processing center, hosting the RAN orchestration framework, a data fusion engine with AI algorithms to combine radio and video data, predictive analysis for dangerous situations, and the backend for Augmented Reality (AR) services. • User and Sensing Components: Includes AGVs with 5G connectivity and human operators wearing 5G AR headsets. A machine vision system with advanced cameras provides the visual data for object and person recognition.
Next steps	The system will be implemented and tested in a realistic industrial environment at the MADE Competence Center in Milan. Integration with the FIDAL end-to-end infrastructure is planned to leverage its advanced management and orchestration capabilities. The next step is to finalize the installation of the testbed and start the operational trials to validate the system's performance in real human-robot collaboration scenarios.
Vertical	Industry 4.0 / Manufacturing
Testbed	Malaga / MADE Competence Center