



IIMEO

IIMEO

Title

Dissemination and Use Plan

Project Name

IIMEO – Instantaneous Infrastructure Monitoring by Earth Observation

Project Number

101082410

Deliverable number

D5.2

Document Number

IIMEO-FBK-D-0004

Issue / internal Revision

01 / 04

Status/Release Date

Released / 30.05.2023

Dissemination Level

Public



Funded by the
European Union

© 2023 - Every effort has been made to ensure that all statements and information contained herein are accurate, however the IIMEO Project Partners accept no liability for any error or omission in the same.



1 PREFACE

In 2022, a European Consortium¹ has been selected by the European Commission to implement the project "*Instantaneous Infrastructure Monitoring by Earth Observation*" (IIMEO)^{2,3,4}. The project is funded by the European Union under the Horizon Europe program as an innovation action with €2.8 million and runs until 30 November 2025. It aims to develop and demonstrate key technologies for the global monitoring of critical infrastructures from space in near real time. A pilot application will be the monitoring of railway lines⁵.

"Energy supply, communications, transportation – our globalized society is highly dependent on functioning infrastructures. Typical examples are roads and railway lines, but also water pipelines, data cables and power lines," explains OHB project coordinator Daro Krummrich. "Just how critical these infrastructures are for daily life becomes particularly apparent when disruptions occur. These can be caused by natural disasters, extreme weather events or deliberate manipulation. In order to be able to restore the functionality of critical systems promptly after an incident, it is important to quickly gain an overview of the overall situation. This is why IIMEO is about detecting infrastructure malfunctions automatically, across large areas and in near real time, regardless of local weather and lighting conditions."

To this end, a satellite system is to be developed within the framework of the project. The intended use case calls for the principles of New Space: Since global coverage and revisit times of less than one hour are required for infrastructure monitoring, the project partners assume that a suitable constellation in low Earth orbit (500 to 900 kilometers altitude) will consist of at least 24 small satellites. Synthetic Aperture Radar (SAR) imaging radar instruments are to be used as payloads, which will be supplemented by sensors for the wavelength range of visible light (VIS). This will enable high-resolution images to be generated even at night and under heavy cloud cover.



Figure 1: Schematic of IIMEO's objectives

Another focus of the project is the development of algorithms. Since continuous global monitoring of infrastructure with SAR and VIS sensors produces gigantic amounts of data, it is necessary that these are already processed on board the satellites. This is to avoid the data downlink being a bottleneck in the system. Davide Di Domizio, Research Programme Administrator at the European Health and Digital Executive Agency (HaDEA) and in charge of IIMEO, explains: "In 2022, the Horizon Europe work program set the ambitious goal of demonstrating the performance of key technologies for future Earth observation systems by 2028. With the development of the planned on-board data processor, IIMEO is well positioned to make an important contribution to this mission."

Once the development phase is complete, all relevant key technologies will initially be combined into an airborne technology demonstrator. The goal of the flight campaign planned for 2025 is to demonstrate the end-to-end prototype downstream service, including on-board data processing. The automated detection of obstacles on railway tracks is to serve as an example application. The national company for the management of railway infrastructure in Serbia was won as a cooperation partner and pilot user. Slobodan Rosić, Serbian Railway Infrastructure Risk Manager, points out: "A satellite-based automatic monitoring system makes it possible to collect high-quality information about the condition of the infrastructure in real time without having

¹ The project is being coordinated by *OHB Digital Connect GmbH* (OHBD), a subsidiary of space and technology group OHB SE. *Antwerp Space N.V.* (AWS) brings its expertise to the on-board data processor. The *Institut für angewandte Systemtechnik Bremen GmbH* (ATB) brings its expertise in the implementation of European projects and the definition and management of requirements. The *Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V.* (Fraunhofer / FHR) brings its expertise on SAR-data acquisition and processing. The *Fondazione Brunno Kessler* (FBK) brings its expertise on real-time capable fully automated detection methods based on AI. The *Universität U Nis* (NIS) brings its expertise on railways and fully automated detection methods based on AI.

² IIMEO Consortium, *Consortium Agreement, IIMEO-OHBDC-CTR-0002, 01, 2022*.

³ European Health and Digital Executive Agency (HaDEA), *Instantaneous Infrastructure Monitoring by Earth Observation (101082410 - IIMEO), IIMEO-EC-CTR-0001, 01, 2022*.

⁴ IIMEO Consortium, "Website IIMEO," [Online]. Available: <https://IIMEO.eu>.

⁵ LinkedIn: <https://www.linkedin.com/company/iimeo-europe/>



Dissemination and Use Plan

to interrupt regular traffic and without the need for personnel on site." The next demonstration mission, currently planned for 2026 and 2027, will go one step further: it will demonstrate that the system developed in the course of IIMEO is also suitable for the global monitoring of railway lines from space.



Dissemination and Use Plan

Table of Contents

1	PREFACE.....	1
2	INTRODUCTION	4
2.1	Purpose of this Document.....	4
3	DISSEMINATION, COMMUNICATION & EXPLOITATION STRATEGY	5
3.1	Dissemination & Communication Strategy.....	5
3.2	Exploitation Strategy	5
3.2.1	Overall Exploitation Plan.....	6
3.2.2	Exploitation Plan per Partner	6
4	ACTIVITIES IN THE REPORTING PERIOD AND KPI STATUS.....	8
4.1	Project Webpage	10
4.2	Newsletter	11
4.3	Press release	12
4.4	Brochure/Flyer	12
4.5	Social media channels	15
4.5.1	LinkedIn	15
4.5.2	ResearchGate.....	16
4.5.3	Twitter	16
4.6	Stakeholder Database	16
4.7	IIMEO Dissemination and communication at events	17
4.8	Exploitation Activities	18
5	OUTLOOK.....	20
6	REFERENCES	21
7	APPENDIX	22



2 INTRODUCTION

Spaceborne Earth observation applications are experiencing a significant increment in the last few decades. This is because of acquisition sensor technology improvement; the launch of novel missions; the use of satellite constellations; the shift toward open access data policies; the increase of data variety and availability, etc. In parallel we observed an increment of data storage and processing capabilities opening the path to the (re)design of solutions for a robust management of novel/old applications and an increase of interest from users in remote sensing based technologies and solutions. This creates a positive loop where users push toward more specific application requirements like real time processing for instantaneous monitoring and research and industry replies with more advance solutions. To feed the loop the Project should reach out the relevant target groups in the research, user and stakeholder communities. Impact indicators will also be included with the purpose of assessing the impact of IIMEO dissemination activities. Regular impact assessments will guide potential corrections to the dissemination plan, and alignment to the exploitation plan will support post-project continuation of dissemination activities including a use plan for long-term circular business.

2.1 Purpose of this Document

Communication and dissemination of ongoing project activities and results are crucial pillars of the IIMEO project which ensures the usability and success of the project's achievements. The main objectives of these activities are to: 1) support project results dissemination; 2) promote awareness and raise visibility of the project, its outputs and objectives; 3) ensure that the project, its results and achievements are widely disseminated by the relevant and identified target audiences in a suitable way. Activities need to be shaped to target, connect and raise the interest of the relevant scientific community within the EU and beyond.

Accordingly, this Deliverable includes first planning of dissemination and exploitation activities and strategy the partners plan to undertake including dissemination goals and channels, target groups, and exploitation approach per project result. It also contains initial considerations of the long-term circular business for IIMEO project along with accomplishment of the predefined KPIs and relevant metrics. It includes all actions undertaken by partners for the reporting period of the first 6 months.

The current and future dissemination and communication strategies are discussed in Section 3. In follow-up Section 4, KPIs are listed in tabular format, reporting on activities to date and the status of the KPIs.

An outlook including activities in the focus of the consortium's work for the next 12 months (begin of M7 to end of M18) and a preliminary list of activities and events for this period is given in Section 5.



3 DISSEMINATION, COMMUNICATION & EXPLOITATION STRATEGY

The initial dissemination and communication strategy for IIMEO project heavily depends upon work done under Communication, Dissemination, Exploitation & Roadmap to Space (WP5), which foresees the following main activities to ensure the uptake of the results, the visibility of the project and the transfer of knowledge to other stakeholders. The project partners are involved in local and international dissemination events in order to target a wider audience. The local events are organized by the partners responsible for the coordination of the case study to show the progress and the activities realized at the local level and to get feedback. The final international/European event will be proposed to illustrate the results and promote synergies with relevant EU projects and initiatives in Bremen or Brussel in collaboration with the appropriate EU institutions.

3.1 Dissemination & Communication Strategy

The Communication Strategy for IIMEO (Communication and community building) aims at monitoring regular activities throughout the 36 months, ensuring continuous content production (web, social media), outreach and stakeholder engagement based on the SMART approach. The strategy involves professional communication specialists, Search Engine Optimization (SEO) experts and copywriters with good knowledge of the topics addressed. The dissemination strategy of the project will be shaped, this will result in a set of scientific, technical or policy related publications to be created in order to capture various audiences.

Communication is mainly related to inform the general public (e.g., social media posts or content on the Website) about IIMEO. Communication is mainly released by the coordinator. For any dissemination related issues the following email address will be used within the project: iimeo.dissemination@ohb.de. For general contact, the mail address iimeo.info@ohb.de is available.

Dissemination considers 4 main activities: i) Local and International Dissemination Events; ii) Publications (scientific, technical, policy-makers), iii) Synergies with other initiatives; iv) Collaboration with other funded actions.

3.2 Exploitation Strategy

The exploitation strategy is meant to ensure systematic and sufficient exploitation of the project's results both during the lifetime of this project and beyond the project's end. During the lifetime of the project, the publicly visible exploitation activities will mainly be academic, i.e. the publication of datasets to be used by the scientific community, research papers explaining what we will have done with those datasets with the corresponding findings, as well as engaging with the general public to build interest and support for IIMEO activities.

The exploitation after the project's end will be prepared during the project in two orthogonal directions, one technical and the other commercial. To be useful to regular monitoring of railways and other infrastructure, the airborne research demonstrator must evolve into a space-based service. The very rough and preliminary plan to achieve this is to adapt sensors, most importantly SAR, in a future follow up demonstrator mission, as well as hard- and software – such as the on-board processing unit, communication links and sensor data processing to correct for atmospheric effects – for a demonstrator mission in space using a single satellite about years after the end of this IIMEO project. For most infrastructure monitoring applications, such a demonstrator would still be insufficient, e.g. in terms of revisit time, but it allows to complete the critical step from air to space, sort out the space-specific issues and, once the demonstrator runs acceptably, scale up to a complete satellite constellation, which, in turn, would be sufficient to operate a useful IIMEO service.

A space-based demonstration mission, however, is more expensive than an airborne demonstrator and a regular service using a satellite constellation is not viable using research funding alone. Thus, the step into space needs discussions with interested organizations, e.g. ESA and DLR, as well as with possible further investors who may be interested in running or using such service.

To exploit synergies and be attractive to more potential customers, while focusing on railways, IIMEO will consider other use cases regarding infrastructure with similar properties, e.g. being geographically dispersed such as roads and powerlines, too. In fact, this started already as mentioned below in Section 4.8. To assess the viability of different use cases, a market analysis will be carried out during the project's lifetime, and use cases will be discussed with possible stakeholders, who, in turn, are also to be identified during this project.



Dissemination and Use Plan

While the commercial aspects of exploitation will only be shared within the project and the European Commission in the “Sustainability and Business Development Report”, we will publicly share the technical exploitation plans in the “Roadmap to Space and for Future Earth Observation Services” [1].

3.2.1 Overall Exploitation Plan

As per the IIMEO Grant Agreement [2], the roadmap to space [1] will include and extend the following.

Algorithms, which will have been demonstrated within the airborne demonstration for geo-referencing regular (VIS) images as well as SAR image data, will have to be adapted for spaceborne application.

Methods for change detection and anomaly detection in regular (VIS) and SAR images will have to be adapted to handle data acquired from space. This includes compensating for atmospheric effects as well as adjusting and re-training machine-learning models with data adequately reflecting the characteristics of imagery acquired from space.

The TRL of SAR and VIS data fusion to improve anomaly and change detection results will have to be increased for its application on a satellite. A further element is about the on-board processing hardware platform that has to be extended to achieve real-time change detection from space with a spatial resolution of up to 50 cm.

To make space-based operation useful for other use cases as well, datasets both to train machine-learning models as well as to validate anomaly and change detection methods for other use cases, e.g. motorways instead of railways, will have to be created.

3.2.2 Exploitation Plan per Partner

Just as the contributions of the IIMEO partners to the project are different depending on the company interests and competencies, different aspects of the exploitation strategy are carried out by different partners. These are as follows.

OHB-DC: Main interest in the project results: Validation of the proposed on-board data processor design in combination with adaptations to and the distribution of the algorithms on the on-board and the off-board data processor to significantly reduce the required data transfer from satellite to ground without reducing the performance of the services; use of the system design and algorithms for future small satellite constellations; develop downstream services which can be integrated into a commercial platform

NIS: Several exploitation modalities will be pursued by NIS. These modalities include: i) Academic research: Publication in academic conferences and journals focussing on open Access publications; ii) Education and Training: As University partner, NIS will use results and expertise gained from IIMEO related to remote sensing-based railway infrastructure monitoring to ensure that related educational course content is updated in line with the developing state-of-the-art; iii) End-user involvement: NIS will involve the Serbian Railway infrastructure from the early on in the project

FBK: Exploitation will be done by FBK in the remote sensing, artificial intelligence community by publishing new developed methodologies. Contribution to the literature will rise from the ability to understand and process very high resolution (<50cm) SAR data at 35GHz, and identify changes in infrastructures like railways. This knowledge will be the base to design novel methods devoted to changes in other kinds of infrastructures and/or other application with Ka-band data.

AWS: Communication to the technical community will be done by AWS in the Space Technology Community, means primary in the ESA/EU governmental community workshops and meetings, EDA/EDF/Nato S&T community workshops and meetings, Space Technology & Application Conferences (as IAC or IAA Smallsat for Earth Observation Conference) For the commercial Exploitation AWS will use the designed Hardware/Algorithm for its micro satellite SCORE SAR payload, which is currently discussed with commercial as well as governmental stakeholders for Earth Observation (X and Ka-Band) or Space Situation Awareness (Ka-Band), as proposed for instance in the EDF CAPTECH Space TBB2 and TBB3. For that Antwerp Space will also cooperate with the European satellite prime integrators and operators. Nevertheless, it must be respected that this is a sensitive technology (named in the Wassenaar Agreements for Export Control), means some countries/regions will be not accepted for the outreach/exploitation as, e.g., China or Russia



Dissemination and Use Plan

FHR: Fraunhofer FHR will exploit the results in the Radar and Radar Signal Processing Community. The project has outstanding scientific potential as it involves several competences, such as sensor technology, algorithms and space technology. FHR has extensive data and scenarios at its disposal to advance its own sensor and algorithm development. In particular, the findings regarding space technology open up new markets for FHR. The research results achieved will be published in at least one renowned scientific journal listed in the SCI/SCIE with a high impact factor by the end of 2026. The results can be published at conferences on Radar (e.g. IRS, EuMW, Radar), on signal processing (EuSAR, ISPRS, SPIE) or other workshops & meetings (ESA, etc.). The research results will also be incorporated into teaching and training of young scientists (PhD students).

ATB: Main interest in the project results: Platform and using satellite and other data for services for earth observation, customisation of potential services particularly in Bremen region and North Europe, further development and commercialisation; further research projects.



Dissemination and Use Plan

4 ACTIVITIES IN THE REPORTING PERIOD AND KPI STATUS

The essential results concerning dissemination and communication instruments and KPIs (Table 4-1, Table 4-2) are presented to form a basis for the structured reporting after the first 6 months of the project runtime. In line with the timing and reporting dates, only selected dissemination and communication instruments (Table 4-1) and activities KPIs (Table 4-2) are considered in this report representing the status at the end of Month 6. The covered entries are marked in green. Other instruments and activities are only considered to a marginal degree in this report since they will be achieved at a later stage in the project. In this deliverable, we are presenting activities resulted between close collaboration of consortium partners during the first 6 months of the project life cycle.

Table 4-1: General Communication Activities KPIs

#	Measure	Driver	Action	KPI
1	Monthly Web content	Regular information updates with SEO-driven approach	Identify and publish new content on a regular basis.	YR1: min. 2/month, YR2: min: 3/month, YR3: min 4/month
2	In-house newsletters	Different stakeholders are informed in a timely manner	Produce and circulate monthly newsletter	YR1: min 6, YR2: min 8, YR3: min 10
3	Promotional material, including video content	Specific audiences receive tailored and timely messages	Design and produce focused material	YR1: min 3, YR2: min. 6, YR3: min 12
4	Press releases targeting major stakeholders on supply/demand sides	Raise interest and recruit actors (e.g., developers, end-users) & supply side actors (e.g., security solution providers).	Produce press releases targeting different media channels and audiences	YR1: min 1 for provider audiences; YR2: min 1/major stakeholder category; YR3: min 2
5	Press releases for general public	Raise interest amongst non-specialized audiences	Lightweight blog for non-specialized channels	≥ 2 press clippings
6	Visibility of IIMEO in channels used by different stakeholder categories	Ensure back-links/branding recognition to website through synergies and social media; General brand recognition is demonstrated	Liaise and engage with initiatives with journalists and LinkedIn groups; Produce a survey for brand recognition	≥ 20 back-links across major stakeholders ≥ 50 responders identified IIMEO (questionnaire)



Dissemination and Use Plan

Table 4-2: Communication KPIs for Stakeholders and Community Engagement

#	Measure	Driver	Action	KPI
1	Social media content: Twitter	Grow community; Regular stakeholder engagement gives important insights into interest	Publish tweets, including SMART-based campaigns & monitor outcomes	YR1: min 4/month YR2: min 8/month YR3: min 16/month
2	Social media content: LinkedIn, ResearchGate	Grow community Regular stakeholder engagement gives important insights into interests/concerns	Publish posts, make relevant tweets, including SMART-based campaigns & monitor outcomes	YR1: min 1 post/month YR2: min. 2 posts/month YR3: min 4 posts/month
3	Stakeholder database	Early identification of prospective marketplace and service stakeholders	Develop a database of contacts for community development and stakeholder engagement	300 profiled & engaged stakeholders by M12; over 500 by M24, and 800 by M36
4	Exhibitions / workshops with free access,	Ensure outreach to non-specialised audiences	Show IIMEO to visitors in lively, lightweight environment	≥ 1 exhibitions/workshops ≥ 50 non-specialized attendees
5	F2F interactions with local people	Ensure engagement with “real people” at the local level	Work with pilot partners to co-host an open day or similar, including media presence	≥ 1 local events ≥ 3 appearances in local media
6	Marketing events, e.g. trade fairs	Ensure direct engagement with major stakeholders	Host a stand decked with demos, videos, info material	Min. 1 in YR2 and 2 in YR3



4.1 Project Webpage

(Table 4-1: KPI #1)

The consortium created a website (Figure 4-1) with the address <https://IIMEO.eu> to inform about the purpose and goals of the project and the participating consortium partners, relevant stakeholders, users and wider audience to show ongoing activities and achievements. For this, the website is regularly updated with promotional material and news Figure 4-2, and includes main information about partners Figure 4-3.

The following measures listed in Table 4-1 are associated with the creation and maintenance of the website:

- **Develop project website** (Table 4-1 #1): The project website was developed within the first 4 months and launched at Month 4 (see Figure 4-1).
- **Monthly Web content** (Table 4-1 #1): Since the launch of the project website, content such as press releases (Figure 4-5) and newsletters (Figure 4-4) have been created on a regular basis while the usability of the website has been curated for multiple platforms (mobile, tablet, etc.).

Web content has been created and 2 news published:

<https://www.iimeo.eu/post/kick-off> from 16th January, Welcome post

<https://www.iimeo.eu/post/first-workshop-at-ohb-facilities-in-bremen> post about our workshop in Bremen from 11th March



Figure 4-1 IIMEO Website homepage.

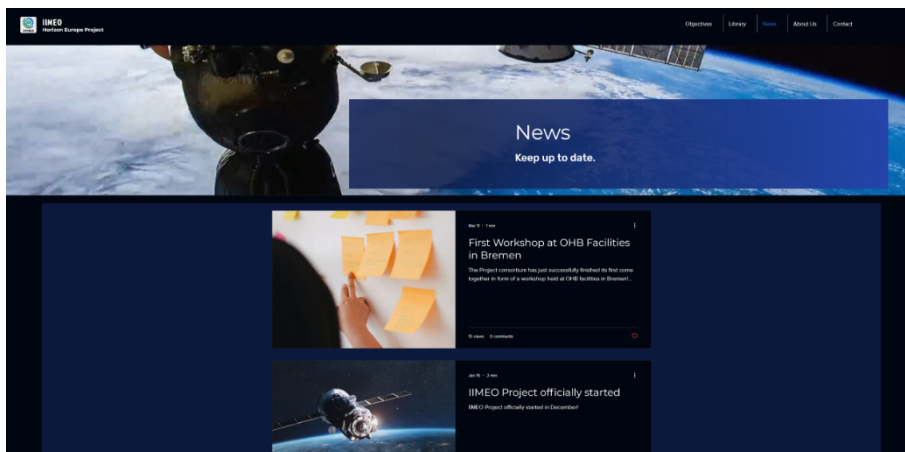


Figure 4-2 IIMEO Website news.

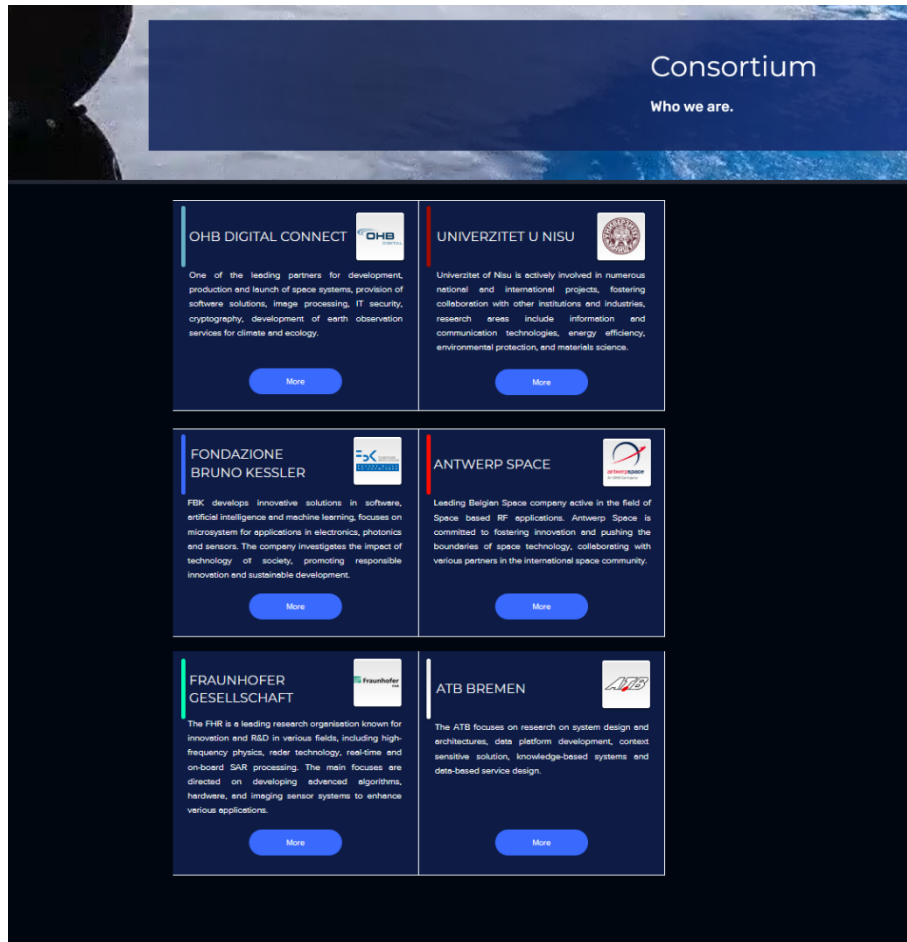


Figure 4-3 IIMEO Website consortium.

4.2 Newsletter

Newsletter (Table 4-1 #2): Newsletter#1 has been published. Figure 4-4 shows the appearance of Newsletter#1 page 1. Newsletter#2 is currently under review process.

The newsletter will be circulated in the relevant communities, see stakeholder table (Table 4-3) and Appendix A .

In addition, the newsletter will be posted on the IIMEO website and delivered to the project community's mailing list.

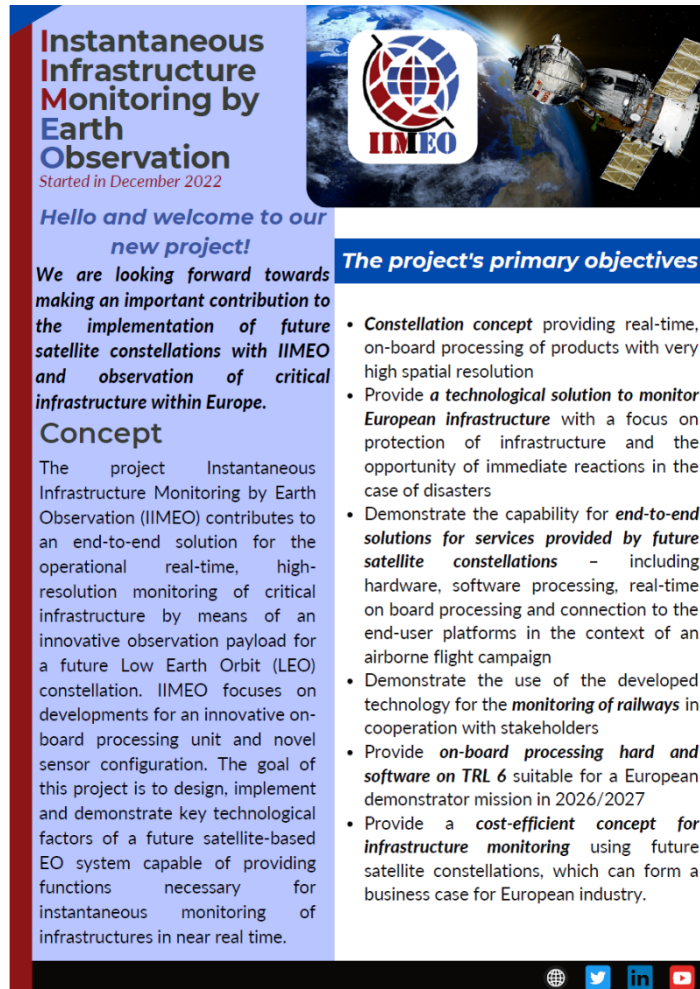


Figure 4-4 IIMEO Newsletter appearance.

4.3 Press release

Press release (Table 4-1 #4 and #5): Press releases will be produced for relevant milestones like the project launch, demo presentation or the end of project. They are expected to reach a wider audience including end-users and non-specialized actors, see Figure 4-5.

The project presentation/launch press release has been published on 30/03/2023. Figure 4-7 shows the appearance of press release #1 on the OHB website⁶. Other 4 followed were emitted by: Fraunhofer (May, 11th 2023)⁷, European Commission, Defence Industry Europe, raumfahrer.net.

4.4 Brochure/Flyer

Brochure/Flyer (Table 4-1 #5): Brochure has been produced for raising interest amongst non-specialized audiences. They are intended to reach a wider audience including end-users and non-specialized actors.

Figure 4-6 shows the appearance of the Brochure/Flyer.

⁶<https://www.ohb.de/en/news/monitoring-critical-infrastructure-from-space-ohb-digital-connect-coordinates-iimeo-project>

⁷<https://www.fhr.fraunhofer.de/en/press-media/press-releases/2023/monitoring-of-critical-infrastructure-from-space--fraunhofer-fhr-is-working-on-the-iimeo-project.html>



IIMEO

Title	Press release on the funding of IIMEO
Project Name	IIMEO – Instantaneous Infrastructure Monitoring by Earth Observation
Project Number	101082410
Work Package	WP 5 – Communication, Dissemination, Exploitation and Roadmap to Space
Document Number	IIMEO-OHBDC-HO-0001
Issue / internal Revision	01 / 01
Author	Phil Daro Krummrich, OHB DC
Contributors	EC, SRI
Status/Release Date	Preliminary /
Dissemination Level	Public

Name	Responsibility	Signature/Date
P.Krummrich	Author	



Figure 4-5 IIMEO Press release #1 cover page.



CONSORTIUM

OHB
One of the leading partners for development, production and launch of space systems, including integrated services for specific customer applications, e.g., the operation of infrastructures, provision of software solutions, image processing/AI based solutions, IT security, cryptography, development of earth observation services for climate, environment and ecology.

AMS
Expertise on system design and architectures, data platform development, context sensitive solution, collaborative environments, context-sensitive and knowledge-based systems, data-based service design including consent aspects.

airbus space
Leading Belgian Space company active in the field of Space based RF applications. AWS core business is in the delivery of satellite communication, navigation and radar solutions as well as instruments for scientific and exploration missions.

FBK
Research in remote sensing information extraction, processing chain design for change detection, artificial intelligence.

Fraunhofer
Research in high frequency physics and radar technology, real-time and on-board SAR processing (algorithms and hardware), development and application of advanced imaging sensor systems.

IRIT
R&D in UAV-based obstacle detection in railways: Field Evaluation and demonstration of technology in real-world operational railway environment.

Instantaneous Infrastructure Monitoring by Earth Observation
Started in December 2022

The project contributes to an end-to-end solution for the operational real-time, high-resolution monitoring of critical infrastructure by means of an innovative observation payload for a future Low Earth Orbit (LEO) constellation.

PROJECT COORDINATOR:
Phil Daro Krummrich
OHB Digital Connect GmbH
Manfred-Fuchs-Platz 2-4
28359 Bremen, Germany
Web: <http://www.obh.de>

OVERVIEW
IIMEO is a project that aims to create a new satellite-based Earth Observation (EO) system with advanced capabilities for real-time monitoring of infrastructure. The project focuses on two main areas: developing a powerful processing unit that will be installed onboard the satellite, and creating a unique sensor configuration. The ultimate goal of IIMEO is to demonstrate the technological advancements of this system and its ability to provide instant and accurate monitoring of infrastructure in near real-time.

OBJECTIVES

- To work towards improving the safety and reliability with EO satellites for critical European infrastructure;
- To build a system which demonstrates that special infrastructure monitoring by earth observation actually works by providing a real user with real railway monitoring data from a satellite platform (i.e., plane);
- To keep track of process to ease similar, future projects;
- To develop a plan to deploy IIMEO on an actual LEO constellation.

IIMEO is open for any use case involving critical infrastructure, for instance pipelines, high voltage power lines etc.

POTENTIAL PILOT USER
SRI JSC (Serbian Railway Infrastructure and its main interests:
In order to prevent derailments and collisions between trains and obstacles on or adjacent to the railway tracks, rail operations should be made even safer in a way of reducing the number of collisions. Effective monitoring is the basic requirement for developing a proactive infrastructure maintenance.
Risks from the environment (natural disasters, unauthorized access to infrastructure, etc.) have become the dominant risks in railway traffic in recent years, and due to climate and social changes, this trend is expected to continue.

MAIN TECHNOLOGIES
For the IIMEO project, SAR and VIS sensors serve as the primary data sources. SAR sensors are capable of providing high-resolution data regardless of weather or time of day. The oblique VIS sensor is aligned with the SAR sensor with the intention to provide service users with more accessible data of sites of interest.

Furthermore, technological innovation focuses on the payload that is intended for future deployment on the constellation satellites. EO missions in LEO utilize lower-cost small satellites and are capable of providing high-resolution data, but in turn require numerous units for global coverage. To avoid data transfer bottlenecks associated with data volume, a promising approach is to perform crucial processing operations on-board. This is referred to as edge computing (contrasting cloud computing, where data is transferred away from the source to some platform prior to processing).

For further processing and the change detection (model based as well as Deep Learning/AI based) as well as anomaly detection will be estimated within this project. We will adapt or choose candidate algorithms for the on-board processor to be in line with the planned time of the fast availability of one hour.

Figure 4-6 IIMEO Brochure/Flyer aspect.



Start > Newsroom > Monitoring critical infrastructure from space: OHb Digital Connect coordinates IIMEO project

30. March 2023

PRESS RELEASE

Monitoring critical infrastructure from space: OHb Digital Connect coordinates IIMEO project

SURVEILLANCE OF RAILWAY TRACKS AS PILOT PROJECT

Bremen, 30.03.2023. The project "Instantaneous Infrastructure Monitoring by Earth Observation" (IIMEO) proposed by a European consortium coordinated by OHb Digital Connect GmbH, a subsidiary of space and technology group OHb SE, has been selected for implementation by the European Commission. IIMEO is funded by the European Union under the Horizon Europe programme as an innovation action with €2.8 million and runs until 30 November 2025. It aims to develop and demonstrate key technologies for the global monitoring of critical infrastructures from space in near real time. A pilot application will be the monitoring of railway tracks.

"Energy supply, communications, transportation – our globalised society is highly dependent on functioning infrastructures. Typical examples are roads and railway lines, but also water pipelines, data cables and power lines," explains OHb project coordinator Daro Krummrich. "Just how critical these infrastructures are for daily life becomes particularly apparent when disruptions occur. These can be caused by natural disasters, extreme weather events or deliberate manipulation. In order to be able to restore the functionality of critical systems promptly after an incident, it is important to quickly gain an overview of the overall situation. This is why IIMEO is about detecting infrastructure malfunctions automatically, across large areas and in near real time, regardless of local weather and lighting conditions."

DEVELOPMENT OF SATELLITES AND ALGORITHMS

To this end, a satellite system is to be developed within the framework of the project. The intended use case calls for the principles of New Space. Since global coverage and revisit times of less than one hour are required for infrastructure monitoring, the project partners assume that a suitable constellation in low Earth orbit (500 to 900 kilometres altitude) will consist of at

Contact:

Martina Lilienthal
Head of Corporate Communications
and Investor Relations
Phone: +49 421 2020 7200
Email: martina.lilienthal@ohb.de



Funded by the European Union.

Figure 4-7 IIMEO Press release appearance.

4.5 Social media channels

(Table 4-2: KPI #1, #2)

The project's social media channels have been established to give IIMEO visibility in a wide community including the scientific and non-scientific components.

4.5.1 LinkedIn

LinkedIn is a business and employment-oriented platform that declares about 850 million users, spread in 200 countries. Being an online social network that is tailored for professionals it is well suited to disseminate research results as those expected from the IIMEO project.

The IIMEO LinkedIn page⁸ currently has a **total of 76 followers (May 10, 2023)** and has **posted more than 10 contributions**, which satisfies the minimum of one post per month during the first year as promised. Figure 4-8 shows the LinkedIn IIMEO homepage.

⁸ <https://www.linkedin.com/company/iimeo-europe>

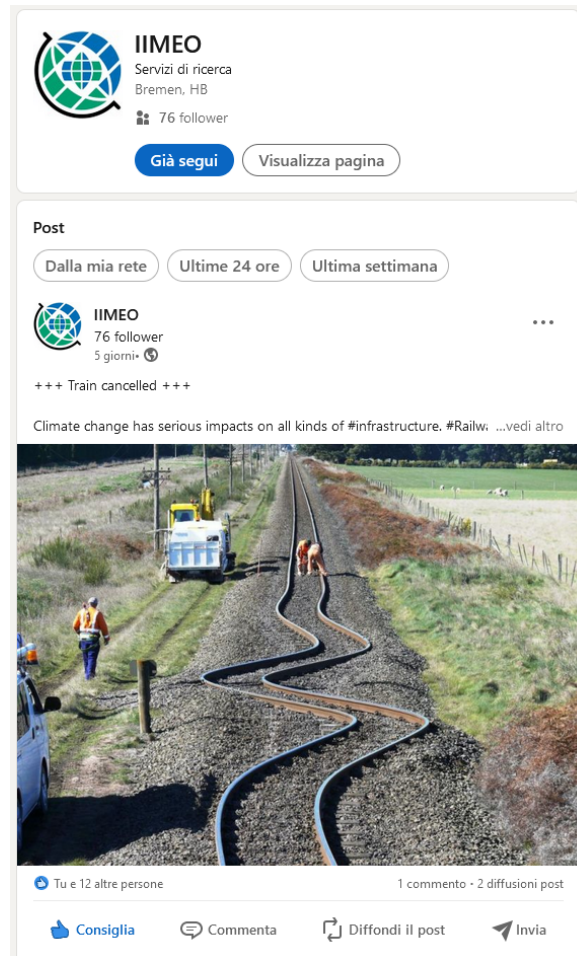


Figure 4-8: Screenshot of the IIMEO LinkedIn Channel homepage May 3, 2023.

4.5.2 ResearchGate

Please note that on February 23, 2023, ResearchGate announced that Projects will be discontinued starting with March, 31, 2023⁹. Accordingly, there will not be an IIMEO ResearchGate page.

4.5.3 Twitter

Twitter is one of the most popular social networking and microblogging service, with more than 368 million monthly active users in 2022. It is also widely used in the scientific community as a tool to disseminate results of innovation activities and to communicate with stakeholders.

The usefulness to create IIMEO twitter account is currently still under discussion.

4.6 Stakeholder Database

The Table 4-3 below identifies the target audience of the IIMEO communication strategy and sets out the communications objectives to maximise the IIMEO project's exposure.

⁹ ResearchGate Retiring Projects," [Online]. Available: <https://www.researchgate.net/researchgate-updates/retiring-projects>



Dissemination and Use Plan

Table 4-3 Stakeholder table

Target Group	Description	Interest in the project
Industry, SMEs and Entrepreneurs	Stakeholders from industry,	<ul style="list-style-type: none">• Utilisation of project's results in operations and in R&D activities for development of new products and services;• Amplification of innovation in railway (or similar) infrastructure
Railway Infrastructure Stakeholders	Railway Infrastructure Managers (IMs) and Railway Undertakings (RUs): The project could provide IMs and RUs with valuable data to optimize their operations and improve efficiency and safety in railway sector	<ul style="list-style-type: none">• Utilisation of project's result to develop novel monitoring services to gather high-quality information about the condition of the infrastructure in real time without having to interrupt regular traffic and without the need for personnel on site
Researchers and Academics	Researchers and academics working in universities, research centres, R&D departments of industry	<ul style="list-style-type: none">• Advancing research post-project;• Training personnel & students;• Translation to real-life industry cases through the re-use of results.
Technology Clusters	European initiatives and clusters, research communities, associations	<ul style="list-style-type: none">• Inclusion of project results to collaborative research activities (roadmap, white papers, etc.);• Dissemination of project results to their members and stakeholders;• Participation in project events for knowledge exchange.
Standards bodies	Standards bodies and industry discussion groups	<ul style="list-style-type: none">• Development of roadmaps for standards;• Input for standardisation activities.
General Public	General public and anyone interested in the project	<ul style="list-style-type: none">• Understand the value of European research;• Stimulate innovation in unexpected groups of society.

4.7 IIMEO Dissemination and communication at events

The IIMEO consortium is already active at different events to raise awareness for the project itself, the concept and expected outcome as well as for the preparation of activities in the pilot regions in the south part of Serbia along the Serbian part of pan-European Corridor X. In this reporting period until month 6, IIMEO was already a topic at the following events indicated at Table 4-4:



Dissemination and Use Plan

Table 4-4 : General Dissemination Activities

Type of event	Name of the event	Partners	Event Description or quantity	Date and duration	City/Country	Type of audience	Estimated # of persons reached
Events @ partners premise #1	KO Workshop	all	Workshop for partner interaction	07-09/03/2023 2 days	Bremen, DE	partners	30
LinkedIn posts		all	> 10	Since IIMEO KO	World wide	Technical/users	hundreds
Website content		ATB	2	Since IIMEO KO	World wide	Technical/users	
Press release		ATB, OHB, FHR	5	Since IIMEO KO	World wide	Technical/users	
News-letter		ATB	1	Since IIMEO KO	World wide	Technical/users	
Brochure/ Flyer	-	all	-	Entire project duration	World wide	broad	
Conference	BREsilient - Resilient Future City of Bremen	OHB	Project closure event	May 2023	DE	Local municipality climate relevant persons	tens
FBK Annual Scientific report		FBK		Spring 2023 for activities in 2022		Local government (in Italian)	Tens

4.8 Exploitation Activities

As laid out in the exploitation strategy in Sect. 3.2, two directions along which to exploit the IIMEO developments of this project are: first to generalize different use cases and infrastructure with properties similar to the characteristics of railway infrastructure, and second to move the IIMEO technology to space.

The first step in the first direction is the identification of such similar use cases. The results are documented in the document D1.1: State-of-the-art Update, Requirements and Use Cases Specifications [3], which is to be submitted at the same time as this deliverable.

Regarding the second direction, it is important to maintain the exploitability with respect to space-based operation of the technology under development in IIMEO as the project progresses. To this end, we reviewed, technical constraints imposed by satellites intended to be operated in Low Earth Orbit (LEO), the orbit itself and data downlinks from such satellite to ground. Moreover, we reviewed what can be expected in terms of computational capacity and from data compression techniques. The findings are document in [3] and will be



Dissemination and Use Plan

used as guardrails to prevent the project from steering into developments which would make the exploitation of IIMEO developments in space much more difficult.



5 OUTLOOK

To continuing and intensifying ongoing dissemination and communication activities, the focus in the period leading up to the next/intermediate Dissemination and Use Plan (month 18) will be on preparing public relation activities and enhanced communication. In addition, we will further specify, develop and populate the stakeholder database (#3 in Table 4-2) and a publication in journal7conferences are in preparation.

Besides these, Table 5-1 lists a number of activities and events relevant for IIMEO's communication and dissemination that are already foreseen or considered for the next 12 months. These include events and activities in the test case areas, webinars and publications. Attendance at scientific conferences and practitioner meetings is planned.

During the project, relevant use cases have been elaborated so far. For the planned exploitation activities, it is foreseen to carry out a first market analysis based on the provided use cases and to identify and prioritize relevant stakeholders. As a first step towards an extension to other applications and target customers, it is foreseen to interview groups of high prioritized stakeholders until M18. In addition to the interviews with relevant stakeholders, it is also planned to analyse funding possibilities from institutional organizations (e.g. ESA and DLR) as well as from commercial investors. As a second step, interviews will be planned with identified parties.

Table 5-1: Planned IIMEO dissemination and communication activities and events until M18

Date of event	Name of the event/kind of activity	Partners	Notes
Month 7-13	Press release		Tagesspiegel
Month 7-13	>10 LinkedIn posts	all	Post
Month 7-13	1 Newsletter	ATB	3 minimum
Autumn 2023	NIS will organise Railcon dissemination event where IIMEO project will be presented to management of Srbija Cargo, Serbian Railway Infrastructure, Despotija and other Serbian cargo operators	NIS	High probability
November 2023	Project workshop	All	Meeting at FBK
~April 2024	Annual Report	Fraunhofer FHR	High probability
~2024	Fraunhofer Research Report	Fraunhofer FHR	Must be evaluated
~2024	FBK Research Report	FBK	Must be evaluated
June 2024	Fair / Exhibition "Wachtberg Forum" (presentation of Radar and RF research)	Fraunhofer FHR	High probability
~2024	Publication at conference	FBK	High probability



6 REFERENCES

- [1] IIMEO Consortium, *D5.9: Roadmap to Space and for future Earth Observation Services*, 2024 (to appear).
- [2] European Health and Digital Executive Agency (HaDEA), *Instantaneous Infrastructure Monitoring by Earth Observation (101082410 - IIMEO)*, IIMEO-EC-CTR-0001, 01, 2022.
- [3] IIMEO Consortium, *D1.1 State-of-the-art Update, Requirements and Use Cases Specifications*, 2023.
- [4] IIMEO Consortium, *Consortium Agreement*, IIMEO-OHBDC-CTR-0002, 01, 2022.
- [5] IIMEO Consortium, „Website IIMEO,“ [Online]. Available: <https://IIMEO.eu..>
- [6] IIMEO Consortium, „LinkedIn Company IIMEO Europe,“ [Online]. Available: <https://www.linkedin.com/company/iimeo-europe>.
- [7] IIMEO Consortium, „ResearchGate Retiring Projects,“ [Online]. Available: <https://www.researchgate.net/researchgate-updates/retiring-projects>.



7 APPENDIX



Appendix A Target Audience

Appendix A.1 Industry, SMEs and Entrepreneurs

Appendix A.2 Railway Infrastructure Stakeholders

Europe's Rail JU (@EURail_JU),
Transport Community Permanent Secretariat (@EUWB6_TCT),
EU Agency For Railways (@ERA_railways),
UNIFE The RAIL IND. (@UNIFE).

Appendix A.3 Researchers and Academics

Remote Sensing communities

Appendix A.4 Technology Clusters

Appendix A.5 Policy Makers

Appendix A.6 Standards bodies and fora

Appendix A.7 General Public



Appendix B Abbreviations & Nomenclature

For all terms, definitions and conventions used, if available.

Abbreviation	Meaning
AD	Applicable Documents
App	Software Application
CA	Consortium Agreement
CI	Configuration Item
CIP	Continuous improvement process
D	Deliverable
DMP	Data Management Plan
DoW	Description of Work
EC	European Commission
ECSS	European Cooperation for Space Standardization
EU	European Union
ERA	European Research Area
GA	Grant Agreement
ICT	Information and Communication Technology
IIMEO	Instantaneous Infrastructure Monitoring by Earth Observation
IP	Intellectual Property
IPMA	International Project Management Association
IPR	Intellectual Property Rights
ISO	International Organization for Standardisation
KPI	Key Performance Indicator
LEO	Low Earth Orbit
LLI	Long-Lead-Item
M	Month
NC	Non-Conformance

**Dissemination and Use Plan**

Abbreviation	Meaning
NCR	Non-Conformance-Report
NCTS	Non-Conformance Tracking System
NRB	Non-Conformance-Review-Board
OA	Open Access
OGC	Open Geospatial Consortium
PA	Product Assurance
QA	Quality Assurance
QM	Quality Management
RD	Reference Documents
RFW	Request for Waiver
RTD	Research and Technology Development
SAR	Synthetic Aperture Radar
SEO	Search Engine Optimization
SME	Small and Medium Enterprise
SW	Software
T	Task
TRL	Technology Readiness Level
WCS	Web Coverage Service
WFS	Web Feature Service
WMS	Web Map Service
WP	Work Package