

#### **URBAN DEVELOPMENT SESSION MOM**

Meeting Date	08.10.2024	Time	09:15-13:00
Meeting Called By	EUSPA	Location	Webex (remote event)
Minutes Taken By	Patricia Lopes Bautista, EY Emanuela Cervo, EY Grazia Maria Fiore, FDC Florian Zedek, FDC	Next Meeting Date	N/A
Attendees	Valeria Catalano, EUSPA, Session moderator/Panel coordinator Teresa Martinez, EUSPA, Session moderator/Panel coordinator Grazia Maria Fiore, FDC Florian Zedek, FDC Emanuela Cervo, EY Patricia Lopes Bautista, EY Gregorio Farolfi, GEAspace User Community Representatives (UCRs) Mark Parrington, ECMWF Ana Ribeiro de Sousa, EEA Renske Martijnse-Hartikka, Forum Virium Alison De Luise, CoM Federico Raspini, University of Florence Gaetano Volpe, Latitudo40 Stamatia Rizou, Singularlogic Christopher Weber, OHB Maurice Barbieri, CLGE Ana Oliveira, CoLabAtlantic		
Distribution (in	UCP Plenary, EUSPA, Pul	blic	
addition to attendees)			

Agenda Items	Presenter		
Urban Development			
1. Welcome and introduction of the Urban Panel	Valeria Catalano, EUSPA		
2. Copernicus Products and Services for Urban Development	Mark Parrington, ECMWF		
	Ana Ribeiro de Sousa, EEA		
3. Space4Cities project	Renske Martijnse-Hartikka,		
	Forum Virium		
4. Covenant of Mayor needs	Alison De Luise, CoM		
5. The use of radar satellite data for the analysis of ground	Federico Raspini, University of		
deformation affecting urban fabric: potentialities and	Florence		
limitations			



Agenda Items	Presenter
6. Empowering Urban Development with Advanced EO	Gaetano Volpe, Latitudo40
7. Buildspace: Energy efficiency of buildings use case	Stamatia Rizou, Singularlogic
8. Urban area monitoring use cases	Christopher Weber, OHB
9. Surveying use cases	Maurice Barbieri, CLGE
10. User requirements validation	Teresa Martínez, Valeria Catalano, EUSPA
11. Roundtable on Space for UD: identification of adoption barriers	Moderator: Ana Oliveira, CoLabAtlantic Participants: Gaetano Volpe, Latitudo40, Stamatia Rizou Singularlogic, Mark Payne, DMI
12. Conclusions and closing remarks	Valeria Catalano, EUSPA

#### Summary

The Urban Development panel of the User Consultation Platform (UCP) 2024 took place on 8<sup>th</sup> October 2024 as a fully remote event. The panel gathered around 50 participants coming from industry, research as well as from European Institutions, covering the whole spectrum of the market segment.

The panellists gave presentations of their applications, how they use satellite technologies (mainly EO, partly GNSS) and what their specific requirements are. This broad coverage generated interest from the participants and helped start good interactions with all the attendees.

The most commented topics are the following:

- Key drivers for the segment: to manage sustainable and resilient cities, prompted by growing populations, urbanization, and a stronger environmental consciousness. In addition to EO, GNSS has also been positively affected by these trends, with the number of GNSS receiver shipments for surveying and mapping doubling over the past decade.
- The integration of AI and Machine Learning is playing a key role in the definition of Urban Development applications.
- New requirements that have emerged include:
  - The need for higher spatial and temporal resolution in EO data. In urban settings, a very high spatial resolution of up to 1 meter is required. This currently requires the use of commercial solutions. Thus, UCP participants highlighted the need for free Very High Resolution (VHR) data to be able to expand the implementation of Urban Development applications.
  - For urban greening initiatives, there is a necessity to integrate information about soil characteristics and the placement of existing buildings.
- Other aspects highlighted were the improved integration of EO and open data and higher revisit times.
- A series of barriers to the further uptake of EO data and services for Urban Development were identified and discussed during the UCP, these included:
- Immediate Actionability: EO data to be more readily actionable. This requires timely and relevant information that can be quickly integrated into decision-making processes.



- Skills and Knowledge Requirements: Implementing EO data is complex, so developing userfriendly platforms is crucial to assist community members and developers who may lack comprehensive expertise in managing the entire deployment pipeline. Ongoing efforts to create platforms that simplify access to data and insights are vital for fostering innovation and encouraging wider adoption.
- Data Overload and Complexity: Users generally prefer processed data that can be seamlessly incorporated into their workflows. Providing 'analysis-ready' data and ensuring interoperability, such as compliance with community standards (CS), are key to overcoming this barrier. By offering data that is ready for analysis, we can address the issue of data complexity.
- Limited Fit for Local Issues: The diversity of end-users and stakeholders necessitates more customized solutions tailored to specific local needs. Additionally, there is an opportunity to explore new business models that cater to this demand for customization. Developing various applications and adjusting business strategies for the private sector will be transformative.

## **1** MINUTES OF MEETING

## Agenda Item 1 - Welcome and introduction of the Urban Panel. Valeria Catalano, EUSPA

Valeria Catalano, Urban Development segment leader at EUSPA, welcomed all participants to the User Consultation Platform (UCP) session. She provided a brief overview of the agenda, the role of EUSPA regarding the EU Space Programme components, the role of the downstream and innovation department and how the entire UCP is indeed a tool allowing EUSPA to achieve closer contact with the user community.

Additionally, she highlighted the market report, which is the result of the activities previously introduced and serves as a key source of market intelligence. Emphasised the ongoing engagement with users to understand their needs, mainly through the UCP. She also mentioned the development of R&D projects and the support provided to SMEs and startups through the Cassini Initiative.

This meeting marked the first occasion that a panel is dedicated to urban development. In this case, the requirements for five specific use cases were presented; urban greening, heat islands; building deformation, energy efficiency and air quality monitoring.

Ms. Catalano also invited the attendees to participate and pose questions via the chat and explained that the user requirement validation would be done via Slido.

Before proceeding with the presentations, the upcoming Cassini challenges were introduced, encouraging the attendees to participate.

The slides of this agenda item can be found as Attachment 1 in section 3.

# Agenda Item 2 - Copernicus Products and Services for Urban Development. Mark Parrington / ECMWF, Ana Ribeiro de Sousa / EEA

Ms Ribeiro da Sousa from the EEA presented their implementation of the Copernicus Land Monitoring service, carried out through 6 groups of products: land cover and land use mapping, priority area monitoring, satellite data, Bio-geophysical parameters, ground motion monitoring and reference and validation data.



Ms Ribeiro da Sousa presented the example of their "Urban Atlas", which encompasses detailed and harmonised land cover and land use maps for around 700 urban areas across Europe. These maps are fundamental for obtaining insights on urban dynamics (e.g., how construction sites become part of the urban mapping) and urban greening (e.g., allow for the distinction between public and private green areas, which is fundamental for measuring ESDG (Education for Sustainable Development Goals) indicators). Complementing the Urban Atlas, EEA has an additional dataset dedicated to coastal zones, extending coverage to areas not included in the Urban Atlas. Another product she highlighted, which is particularly valuable for monitoring coastal areas was the High-Resolution Layer on impermanence density.

Additionally, Ms Ribeiro da Sousa introduced the vegetation technology and productivity analysis, which uses Sentinel 2 data to examine vegetation seasonality across Europe and offers three types of results; daily vegetation indexes, seasonal trajectories and annual parameters.

Furthermore, the European Ground Motion Service was introduced. This service is particularly useful to control the changes taking place around critical infrastructures such as airports and train stations.

Ms Ribeiro da Sousa explained that the EEA offers multipurpose products that can support users and combined with national data sources, other CLMS products and that can be applied in a variety of contexts.

Finally, Ms Ribeiro da Sousa presented a selection of use cases that use CRMS data;

- HR VPP vegetation and productivity technology to understand and manage urban spaces.
- Creation of local climate zones, can be used by city planners to allow them to identify areas of the city and population groups that are most at risk, develop response plans and mitigation strategies.
- Use of VPP to analyse urbanization.
- Study supported by several CLMS datasets to develop the methodology to identify and develop the most effective green infrastructure.

The slides of this agenda item can be found as Attachment 2 in section 3.

Mr Parrington from ECMWF continued the panel on the topic with a presentation on C3S and CAMS thematic information services. He presented two case studies;

 For C3S, Mr Parrington presented a use case developed by VITO. The company leverages analytical outputs and climate prediction analysis from the Copernicus Climate Change Service (C3S). By modelling this information, VITO successfully downscales the data to provide detailed climate change parameters at a high resolution of 100 meters, spanning a specific time period.

Some examples of cases where this has been applied are;

- UrbCLim in Johannesburg: this case study examines the urban heat impact and correlates it with other metrics such as the population distribution, to determine where the effect is most pronounced across the city.
- In Belgium: the case study analysed heat stressed and linked it with higher urban data.
   Conducting such granular analysis enables the identification of areas within urban environments that are most affected by heat stress.
- In the case of CAMS, Mr Parrington explained that this service provides EO data linked to weather, air composition and air quality at global and regional level. Due to the fact that this data is of open access, it can be used for a variety of applications, downscale and high scale. Examples of the application of this service to urban development included:



• Air quality monitoring: the forecast provided by CAMS can provide information on emissions and a variety of pollutants. Weather applications use this information and then downscale it to specific areas.

Air quality information can also be used for the development of urban and climate policies and can help understand crucial aspects such as residential traffic flows. Additionally, CAMS offers custom scenarios that allow the user to analyse the impact of certain policy results such as the impact of a total reduction of residential traffic on air quality.

The slides of this agenda item can be found as Attachment 3 in section 3.

## Agenda Item 3 - Space4Cities project. Renske Martijnse-Hartikka / Forum Virium

Ms Martijnse-Hartikka presented Space4cities, a project funded by Horizon Europe and coordinated by Forum Virium Helsinki. This project focuses on commercial procurement of satellite data solutions for cities. The objective of this would be that cities would be able to manage more dynamically their urban areas and to react in a more agile way to climate events and climate change.

Ms. Martijnse-Hartikka explained that pre-commercial procurement involves looking for solutions not yet commercially available on the market. Space4cities is an R&D project in which cities and companies work closely together to meet the needs of the former. Ms Martijnse-Hartikka highlighted that the most important part of the project is that the solutions are scalable, which will be demonstrated through replicators in replicators cities.

The goal of this project is to learn how cities can better use spatial solutions to adapt to climate change and other pressing needs.

Ms Martijnse-Hartikka presented a series of challenges common to the majority of the cities; urban mobility (reduction of emissions), optimisation of urban mobility (adaptation to sustainability and climate) and urban planning and management.

Once the project was presented, Ms Martijnse-Hartikka informed the UCP attendees that, in case they were interested in participating, the call will open mid-January.

Following this presentation, Ms Martijnse-Hartikka proceeded to explain the Precommercial Procurement process which will involve a three-step process, from the design of the solution, the development of the prototype to the piloting and execution of the solution.

The idea of the process is to start with 20 contributors and then, after each phase reduce the group by 50%, ending with 5 winners.

Ms Martijnse-Hartikka announced that they are currently at the open market consultation stage but in case any of the participants is interested in receiving further information, there will be hosting local webinars, and that Forum Virium will be participating in the IAC Milan and the Smart City Congress in Barcelona.

#### **Q&A** Session – Verbal interventions

#### **Q** – Alison de Luise: Have the replicators and follower cities already been identified and selected? A: The selection process for the replicator cities has not been finalized yet. We are continuing to

A: The selection process for the replicator cities has not been finalized yet. We are continuing to welcome additional cities for at least the next year. The selection of replicators will only occur once



we have identified the last five solutions, as these will be piloted in the upcoming cities as well as in the two replicator cities. Therefore, we can only proceed with choosing the replicators after we have a clear understanding of the five solutions.

#### The slides of this agenda item can be found as Attachment 4 in section 3.

#### Agenda Item 4 - Covenant of Mayor needs. Alison De Luise / CoM

Ms De Luise participated in this UCP in representation of the EU Covenant of Mayors. As Ms De Luise explained, this is a European Commission initiative designed to support local authorities to achieve their 2050 visions of decarbonised and resilient cities with access to affordable, safe and sustainable energy through the implementation of the climate and sustainable energy action plan.

Ms De Luise presented the three main pillars of their project:

- Mitigation
- Climate adaptation
- Energy poverty

Currently, this project covers around 11.000 local authorities, representing about 240 million citizens across all 27 Member States. Their well-established framework provides numerous opportunities for integrating information services, high-resolution data, and weather data derived from Earth observation. These resources are particularly valuable in supporting municipalities at various stages of their planning process, including the development of climate emissions inventories.

In addition, Ms De Luise noted that municipalities are tasked with creating risk and vulnerability assessments for climate adaptation and must monitor the effectiveness of their actions. However, access to critical information and data, such as that from Earth observation, is often limited. A key issue identified was the lack of awareness among cities about these valuable services.

The initiative has recently started to delve into Earth observation and space-based services by engaging with experienced practitioners and conducting a consultation with representatives from around 16 Member States, as well as experts from climate, aerospace, and defence sectors, including ESA and ECWF. This step is part of a broader effort to enhance capacity building and to inform the community about the benefits and existing resources of Earth observation services, while also gathering their specific needs.

Ms De Luise explained how they gathered information on these specific needs through a consultation process. She highlighted the community's interest in utilizing Earth observation services for various applications, such as spatial planning, road condition monitoring, and climate adaptation strategies, including assessing heat island effects and optimizing the placement of nature-based solutions. However, it was acknowledged that the capability and experience in using these services vary widely, especially when considering smaller municipal authorities with limited. The level of understanding and ability to utilize these services is generally low among these smaller entities. This disparity means that although the services are available, the capacity to effectively use them and interpret the data they provide is inconsistent. The practitioners have expressed a strong need for increased support and capacity building to leverage these services effectively.

Other challenges highlighted by Ms De Luise included lack of technical capacity, difficulty in navigating the available services, language barriers, and the prohibitive cost of high-resolution data services.



The discussion emphasized that the value of Earth observation data extends beyond the raw data itself; it includes the analytical tools that interpret the data and support decision-making processes. The need for high-resolution data is consistently expressed, with local authorities requiring detailed insights to make informed decisions about urban planning, such as the placement of trees, green infrastructure, and identifying urban heat islands.

## The slides of this agenda item can be found as Attachment 5 in section 3.

# Agenda Item 5 - The use of radar satellite data for the analysis of ground deformation affecting urban fabric: potentialities and limitations. Federico Raspini / University of Florence

Mr Raspini, from the Earth Science Department at the University of Florence presented the results of a project he is carrying out alongside with the regional authority of Tuscany for the use of satellite data for the analysis of ground deformation affecting the urban fabric.

The region of Tuscany has a complex morphology, with mountain ranges making the area particularly prone to landslide. These movements can affect urban fabric and villages, and the issue is worsened when considering the current climatic situation. Mr Raspini highlighted the need for regional authorities to have access to tools that are updated regularly and systematically in order to have access to information on where, when and at what speed the ground is moving. This would allow them to take the appropriate measures to avoid damages as much as possible.

Mr Raspini presented the requirements from the public authorities for this kind of system:

- Regional coverage
- Provision of accurate and precise data
- Continuous stream of information
- Low cost

The solution presented by Mr Raspini and implemented in the region of Tuscany from 2016 is based on satellite data interferometry. This is a consolidated technique capable of measuring and monitoring deformation however, the authorities wanted to move from the static image towards a more dynamic information system. Due to this, the system implemented Is based on a continuous update of radar images as soon as they are available. By doing this, it is not only possible to map ground deformation but also to identify the areas where unexpected ground movements are taking place.

Mr Raspini provided examples of use cases where this system has been used;

- Apennine area which experienced an acceleration of the ground deformation following heavy rain and snow. This acceleration was identified by the monitoring system and the regional authority was informed. After this, actions were taken in the form of a monitoring system and a robotic station to map and monitor the movements affecting the buildings located in the affected area.
- City of Pistoia: this whole city is affected by landslides. A system based on Sentinel-1 was
  implemented and it detected the acceleration of the ground movement. Following this, the
  authorities decided to use a process based on the satellite interferometer but using an X-band
  satellite (Cosmos Sky-Med) which has a finer spatial resolution and is able to cover in more
  detail the deformations affecting each building. This information allows to produce damage
  probability maps and potential loss risk maps.
- City of Volterra: Also affected by landslide, thanks to the X-band satellite data and Cosmos



Skymed, it is possible not only to map the deformations affecting each building but to identify those buildings affected by the differential segment and the distortion, which are the main parameters that must be quantified in order to assess the stability of any of the buildings.

Mr Raspini concluded highlighting the importance of the use of satellite interferometry for mapping and monitoring ground deformations. Copernicus, particularly through the Sentinel-1 constellation, has enhanced this approach by enabling dynamic monitoring of buildings impacted by geological processes such as subsidence, fires, or landslides. This dynamic approach helps identify priority areas for initiating detailed measurements.

Advancements in satellite interferometry, allow for precise mapping of deformations affecting buildings under certain conditions. This capability extends to assessing the stability of structures and making informed evaluations about their condition.

The slides of this agenda item can be found as Attachment 6 in section 3.

#### Agenda Item 6 - Empowering Urban Development with Advanced EO. Gaetano Volpe / Latitudo40

Mr Volpe represented an Italian company that offers solutions to support climate adaptation, resilience strategies and sustainable urban solutions based on three pillars;

- Space data: they have integrated different satellite constellations into their platform.
- Artificial Intelligence algorithms: to understand and extract the data from the satellite imagery.
- Platform to access AI and simulation tool.

Mr Volpe presented the barriers and challenges that they identified during their market research:

- Lack of immediate actionability
- Skill requirements to implement space data
- Data overload and complexity
- Limited fit for local issues
- Data integration

On the basis of this, Mr Volpe presented their solution, a scalable product adaptable to all cities in the world. The basis of this product is the Digital marketplace, through which all users can upload data to integrate with GIS or other applications. The Software-as-a-Service Platform is like a Web GIS where cities can play with data, but also obtain reports which are sometimes the most acceptable solutions to integrate with this marketplace. Additionally, some cities are creating Urban Digital Twins, for which satellite data is a very important contribution.

Mr Volpe also presented another product, currently under development, to distribute information on coverage density and land surface temperature four times a day. This will allow cities to obtain information on the areas of the city affected by temperature changes. This information can also be integrated with the population layer to create indexes in the impact of temperature on the population.

Additionally, Mr Volpe introduced another product focused on flooding and its effects on cities and individual buildings.



The objective of these products is to enable cities and urban planners/developers to identify and measure the risks to elaborate mitigation plans.

Furthermore, Mr Volpe presented the case study of the implementation of their products on the city of Milan. Their solution was used to support the air climate policy through temperature and urban heat island mapping.

Another study case presented by Mr Volpe was that of the city of Bologna, where they are working on the Bologna Digital Twin Project. In this case, they integrated the algorithm with the open data from the city to identify bike lanes that would be more climate resistant and to implement a strategy to reduce the temperature exposure of bus stops.

The slides of this agenda item can be found as Attachment 7 in section 3.

## Agenda Item 7 - Buildspace: Energy efficiency of buildings use case. Stamatia Rizou / Singularlogic

Ms Rizou presented the BuildSpace project, which is aimed at the achievement of innovative services for the urban environment by focusing on the built environment in order to achieve energy-efficient buildings and climate-resilient cities. The objectives of this three-year project are;

- Target the building ecosystem within the urban environment to define the use cases and integrate them into a co-creation process for the design of the applications developed in the context of the BuildSpace project.
- Work and deliver baseline infrastructure, facilitating the use of heterogeneous data, including EO
- Develop services at building level; heterogeneous building and waste, and at city level; cityscale services to analyse the urban environment, and services for climate resilience and forecasting.

Ms. Rizou provided an overview of the BuildSpace project, which aims to enhance the exploitation and impact of services developed within the project. She outlined the project's collaboration on infrastructure to exchange and host data, including integrations with Copernicus and EGNSS services.

The project has developed two construction/building-level services: the generation and enrichment of digital twins, which aid in construction, renovation, and monitoring. At the city level, three services are being developed for environmental scenarios, focusing on energy performance, urban heat analysis, and urban resilience.

Ms. Rizou mentioned the initial co-creation sessions with partners from the construction and urban environment sectors, which led to the identification of 53 use conditions, mostly functional, shaping the design of the services to align with partner needs. These conditions were translated into technical specifications for service implementation.

The project leverages Copernicus services for climate change analysis and EGNSS and Galileo for precise positioning in the urban environment. Efforts are made to align with initiatives like Destination Earth and to disseminate project results.

For city-scale services, climate scenario analysis combines climate data with accepted standards to project energy demands. Additionally, the project has developed services for urban heat analysis,



tested in Athens and Piraeus, using Copernicus products and demographic data to create informed maps for heat variability analysis.

The project's services, including Digital Twins, are being piloted in various locations, such as Poland, Riga, Piraeus, and Ljubljana, to test resilience and urban heat analysis. Ms. Rizou concluded by stating that the project is in the testing phase, with the goal of gathering information, learning lessons, and making service adjustments.

On a final note, Ms Rizou mentioned that within this project, an educational kit has been proposed. This kit provides detailed explanations on the development and usage of the services offered by the project. The current mission is to explore the potential for replication and utilization of these services in collaboration with the project partners. This initiative aims to enhance understanding and facilitate the broader application of the project's outputs.

The slides of this agenda item can be found as Attachment 8 in section 3.

## Agenda Item 8 - Urban area monitoring use cases. Danijela Ristic-Durrant / OHB

Ms Ristic-Durrant represented OHB digital services, which focuses on the development and implementation of downstream applications. Ms Ristic-Durrant presented three applications related to urban development:

- Urban vegetation monitoring
- Urban heat
- Rail temperature monitoring

Ms Ristic-Durrant discussed the development of EO services for these applications based on the combination of satellite data, such as Sentinel-2 data with ancillary data, such as urban soil cadastres., which serves to monitor tree health at the group level and track temperature changes. Another example would be the use of Sentinel-3 satellite data complemented by commercial and auxiliary data, focussing on monitoring temperatures in urban districts and analysing temperature fluctuations over time.

The requirements for these services were established through consultations with cities in the Ruhr area of Germany, notably with the city of Essen. Ms. Ristic-Durrant outlined specific user needs for these services, including monitoring tree health, assessing tree degradation due to road construction and stress, and supporting climate action measures to mitigate urban heat and enhance the microclimate. To meet these needs, usage requirements were defined, such as providing access to indicators of tree health derived from satellite data with a spatial resolution capable of identifying individual trees over a period of five or more years and a temporal resolution of five weeks. To fulfil these and other requirements, data from various resolution satellites are combined with auxiliary data, including urban cadastres and crucially, city disaster data.

Different algorithms are applied to process the data, such as a step-by-step algorithm for transitioning from Sentinel-3 to achieve high-resolution Land Surface Temperature (LST) maps for the urban heat service, and other algorithms to extract indicators of tree vitality, like the NDMI.

For the case study, Ms Ristic-Durrant focused on rail temperature monitoring, which is a service developed to support rail infrastructure managers, international and urban. For this service, a combination of different satellite indicators such as Sentinel-3 and Sentinel-2 with auxiliary indicators



is used to develop the service for estimation and prediction of temperature of rail tracks. This service is currently under development through different projects with EUSPA.

The user needs and requirements for this service have been defined in consultation with a variety of infrastructure managers such as Deutsche Bahn, InfraGo and public transport managers such as BSAG. Some of the user needs listed were presented in the slides.

One of the requirements highlighted by Ms Ristic-Durrant was the spatial resolution of 100 meters or less, which they achieve through the combination of satellite data (Sentined-3 and Landsat) and the application of different algorithms.

The slides of this agenda item can be found as Attachment 9 in section 3.

## Agenda Item 9 - Surveying use cases. Maurice Barbieri /CLGE

Mr Barbieri presented a series of surveying use cases, mainly focused on the use of GNSS. The organisation he represented; the Council of European surveyors encompasses more than 14 countries in Europe and are carrying out the GISCAD-OV project for EUSPA.

GISCAD-OV is based on Galileo HAS. The goal of the project is to test the implementation of Galileo HAS for surveying applications.

Mr. Berbieri presented the project's aim to develop a high-accuracy, cost-effective service for cadastral surveying, involving a consortium of 13 partners. The project focused on testing signals in various environments, with particular challenges in signal availability in urban areas and the exploration of new markets. National mapping and cadastral agencies were involved, highlighting the need for GNSS services within their countries.

Key outcomes included infrastructure optimization for better service delivery and enabling receiver manufacturers to adapt to new signals. The project achieved validation in May 2023, with Level 2 accuracy identified as necessary for the centimetre-level precision required in the profession.

Future applications of the technology were discussed, including its use in autonomous vehicles and agriculture, with the potential to address challenges such as signal quality and antenna errors. The technology proved resilient during an earthquake in Croatia, demonstrating its robustness and utility in various scenarios.

The slides of this agenda item can be found as Attachment 10 in section 3.

#### SESSION BREAK

## Agenda Item 10: USER REQUIREMENTS VALIDATION

The section on User Requirement Validation was presented by Ms Teresa Martínez, EO Consultant at EUSPA.

Ms. Martinez provided an overview of the section's approach, which was grounded in user requirements and needs for prioritized applications, as well as operational scenarios developed from expert interviews and user community consultations. The goal was to showcase urban applications, comprehend user needs, and validate and discuss technical parameters specific to these cases.



For each application, Ms. Martinez explained that a brief introduction would be given, followed by an interactive segment utilizing Slido to pose three questions to the audience. These questions aimed to collect attendees' perspectives on the needs, challenges, and potential new ideas for each application. She emphasized the importance of participant feedback, urging attendees to actively contribute as their insights are crucial for developing effective solutions that support both users and the industry.

Ms. Martinez then proceeded to delve into the details of each of the five applications under discussion.

- Urban greening: which encompasses two operational scenarios, smart urban green infrastructure and health monitoring of trees and vegetation.
- Urban heat island: encompasses two operational scenarios, Urban heat mapping for urban planning and alert system, and long-term forecasting of urban heat islands
- Building deformation: covers buildings affected by geological processes such as subsidence and landslides.
- Energetic efficiency of building blocks: focuses on evaluating buildings energy efficiency and consumption.
- Air quality monitoring for municipalities.

Participants were encouraged to share their views and comment on other operational scenarios if found relevant.

Ms Catalano also informed the participants that the questions would be shared offline to allow for more time to reply.

## Validation of requirements

(See draft user requirement tables for EO and GNSS in Attachment X)

On EO side, new requirements that have emerged include the need for higher spatial and temporal resolution in EO data. In urban settings, a very high spatial resolution of up to 1 meter is required. This currently requires the use of commercial solutions. UCP participants highlighted the need for free Very High Resolution (VHR) data in order to be able to expand the implementation of Urban Development applications.

For urban greening initiatives, there is a necessity to integrate information about soil characteristics and the placement of existing buildings.

Other aspects highlighted were the improved integration of EO and open data and higher revisit times.

The slides of this agenda item can be found as Attachment 11 in section3.

## Agenda Item 11 - Roundtable on Space for UD: identification of adoption barriers. Ana Oliveira / CoLabAtlantic

For this panel, Ms Oliveira prepared three questions for the experts and encouraged the audience to participate.



**Q1**: With more EO missions, geospatial data sources, and algorithms available than ever before, how do you choose among these options? What could be improved technically to make it easier for users to adopt your solutions?

During the discussion, Mr Volpe highlighted the primary obstacle hindering the connection between technology and the end user, which is the lack of knowledge about the technology among end users. Mr Volpe emphasized the need for technology to solve a problem, noting that in the past, such technology was not accessible to non-space users due to the required upfront investment and resources.

Ms Rizou then took the floor, agreeing with Mr Volpe's point and discussing the challenge of facilitating data consumption. Ms Rizou stressed the importance of providing platforms that simplify the process and make it more accessible to the community and developers who may not possess the expertise to manage the entire deployment pipeline. Ms Rizou mentioned that platforms currently under development are crucial for providing access to various data and insights, and for their use in the context of innovative applications, which is vital for overcoming barriers and encouraging further adoption.

Mr Payne shared his personal experience, stating that he tends to utilize what is already available through other data providers. As a user, he prefers data that has been processed to a degree that allows for direct implementation in his work.

Ms Oliveira added to the conversation by expressing the need for analysis-ready data and interoperability between data sources, such as CS compliancy. She concurred with the panel that offering analysis-ready data is a key step in overcoming the barrier between technology and users.

**Q2:** In Europe, EO information is typically provided by public sectors like weather services and environmental institutes, focusing on national needs. What are the main opportunities and challenges for EO uptake when serving end users?

Mr Payne discussed the challenges related to data packaging and the need for it to be analysis-ready, which varies among end users. He elaborated on the challenge of bridging the gap to ensure data is available at varying levels of complexity to meet diverse needs. He also noted the growth of the private sector, particularly in areas like corporate taxonomy reporting, which demands specific data readiness.

Ms Rizou addressed the need for greater customization tailored to end users and the associated challenge of rethinking potential new business models. This customization necessitates the development of diverse applications, which in turn may alter the business models of these applications, especially when targeting the private sector.

**Q3**: What are the main barriers to EO adoption from a regulatory, business, or customer knowledge perspective? How can these barriers be addressed?

Ms Rizou pointed out that technology alone is not a panacea; it is crucial to ensure that technologies adopted by end users are effectively upscaled. A significant barrier to this is the lack of knowledge among end users. To address this, Ms Rizou emphasized the importance of developing capacity-building programs and intensifying the promotion and sharing of experiences. The panellist suggested that the promotion and sharing of case studies should be amplified to engage a wider audience.

Mr Payne commented on the necessity of having technical availability and analysis-ready products that align with the users' level of competence and intended usage. He also identified awareness as a key issue, implying that increasing awareness is essential for the effective utilization of these technologies.



To close the discussion, Ms Catalano and Ms Martinez opened the floor to the audience to share their opinion on how to choose amongst the numerous EO data sources and what could be improved technically to further adoption. A follow up question posed to the audience focused on the main opportunities and challenges for the uptake of EO.

#### Agenda Item 12 - Conclusions and closing remarks. Valeria Catalano / EUSPA

Ms Catalano thanked the experts that participated in the discussion panel. Ms. Catalano concluded the session, by expressing her gratitude to all participants and speakers for their contributions to the user and urban development panel. She reflected on the discussions, noting that 'awareness' was a key theme that emerged from the panel's outputs. Ms. Catalano emphasized the need for concerted efforts to enhance synergies with trusted entities, municipalities, and private users.

She appreciated the feedback received during the panel and announced that in the coming days and weeks, the user requirement document, along with the minutes of the meeting, would be published. This publication will include all presentations and questions, providing additional time for participants to respond.

With this, Ms. Catalano officially closed the meeting, thanking everyone once again and mentioning that they would remain in contact for the next steps.



## 2 OTHER NOTES & INFORMATION



## **3** ATTACHMENTS

Attachment 1: Welcome and introduction of the UD panel

Attachment 2: Copernicus Products and Services for Urban Development

Attachment 3: C3S and CAMS Products and Services for Urban Development

Attachment 4: Space4CITIES project

Attachment 5: Needs, experiences, capacities of Covenant community

Attachment 6: The use of radar satellite data for the analysis of ground deformation affecting urban fabric: potentialities and limitations

Attachment 7: Empowering Urban Development with Advanced EO

Attachment 8: Enabling Innovative Space-driven Services for Energy Efficient Buildings and Climate Resilient Cities

Attachment 9: Urban area monitoring use cases

Attachment 10: Surveying for urban development use cases

Attachment 11: User requirements validation



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