

OUTPUT FACTSHEET

Project index number	CE0100439	Acronym	BIM4CE			
Output type ("x" to be included)	Strategy/ action plan		Pilot action		Solution	x
Output number (O.xx)	2.4	Output title	BIM approach (software)			
If the output target is > 1 in the AF, please specify the output(s) described in the factsheet						
Output delivery date	3/30/2025					
Project website	https://www.interreg-central.eu/projects/bim4ce/					

Summary description of the output

Please present the output by addressing the following topics.

Territorial challenges and needs in the regions specifically addressed by the output

(max. 700 characters)

The expert council for bridge monitoring is a diverse assembly, comprising legal representatives from various sectors. This includes research institutes with extensive experience in prior projects related to bridge monitoring systems. Furthermore, the council incorporates private companies specializing in the maintenance of bridge monitoring systems. Additionally, sensor producers actively seek collaboration opportunities within the council to bolster their sensing capabilities and integrate innovative standardized bridge monitoring approaches with existing technologies.

Main aim(s) of the output and how it contributes to tackle the identified challenge(s)

(max. 500 characters)

The output aims to develop and demonstrate a practical BIM-based Digital Twin (DT) approach for real-time bridge monitoring. It addresses key regional challenges, aging infrastructure and lack of proactive maintenance, by integrating 3D models and live sensor data into an accessible digital environment to support informed, data-driven decisions.

Technical description of the output (e.g. scope, main features, innovative elements etc.)

(max. 1500 characters)

The output consists of a structured workflow for creating a semantically enriched Building Information Model (BIM) integrated with real-time sensor data through the Infohub Digital Twin platform.

Developed for the Tomačevo Bridge demonstrator, the system combines point cloud-based geometric modeling with a standardized semantic layer based on Level of Information Need (LOIN). Sensors are instantiated and enriched using linked metadata, and sensor data is visualized in real-time via a custom interface built in Desite MD.

Key features include:

- Modular data pipeline from raw data to live visualization.
- OpenBIM and IFC compliance for interoperability.
- Dynamic creation and semantic enrichment of bridge elements and sensors.
- Tailored visual alerts for threshold exceedance (e.g., overweight vehicles).

Innovative elements lie in the integration of structured BIM with live IoT data in a cost-effective, scalable solution suitable for widespread regional adoption.

Involvement of target groups during output development and/or implementation

(max. 700 characters)

Key target groups, including infrastructure operators, monitoring specialists, and regional bridge authorities, were actively involved through consultations, data sharing, and pilot testing. The demonstrator bridge was selected with local stakeholder input, and feedback from partner institutions (e.g., Cestel, ZAG) informed both sensor placement and BIM data requirements. This ensured practical relevance and alignment with regional needs.

Cooperation dimension of the output, i.e. joint development within the partnership and, if applicable, joint implementation (see output indicator definitions in chapter I.3.3 and Annex 2 of the programme manual)

(max. 700 characters)

All members of the consortium actively participated in the development of this output. TU Dresden, as lead partner, coordinated the overall process, while FOS Spa, CSP ICT Innovation, Schüssler-Plan Digital GmbH, BP Akademija, Cestel, ZAG, and SINA contributed their specific expertise. Together, the partners jointly developed the BIM-DT approach, bringing in complementary knowledge from different countries in bridge engineering, BIM modelling, and sensor integration. Tasks were distributed across the consortium, covering data provision, model creation, and software development, while continuous collaboration ensured interoperability and a shared methodological framework. The Infohub served as a centralized platform for cross-border data management and visualization, enabling smooth cooperation and integration of results.

Results - expected change and lasting effects in the territories generated specifically by the output, its uptake by relevant organisations and benefits for target groups

(max. 1000 characters)

The output provides a ready-to-use methodology for integrating BIM and real-time data into infrastructure monitoring. Its implementation is expected to improve proactive maintenance, reduce inspection costs, and extend asset lifespan. The open, replicable system will be promoted across Central Europe through workshops, digital access, and pilot replication. Regional authorities and engineering firms can directly apply the solution to other bridges, fostering digital transition in infrastructure management and ensuring long-term impact through continuous data integration and stakeholder engagement.

Ownership and durability of the output after the project end, considering financial and institutional support including, if applicable, maintenance

(max. 700 characters)

The ownership and long-term maintenance of the output lie with Schüßler-Plan Digital GmbH (SPD or PP4). The digital twin platform was developed and is hosted on SPD's internal infrastructure, ensuring continued technical support and system availability beyond the project's lifetime. Sensor data from the bridges is continuously uploaded to Infohub, a BIM-based information management platform. This setup ensures institutional and financial continuity for the operation, maintenance, and future scalability of the digital twin system.

Transferability of the output to other territories, sectors or target groups and planned measures for supporting such transfer

(max. 700 characters)

The output has already been applied in Germany and Slovenia and is planned for implementation in Italy, confirming its transferability across national and technical contexts. Its modular design and use of open BIM standards enable easy adaptation to different infrastructure types and administrative frameworks. The solution has strong potential for expansion and scale-up across Central Europe, particularly for public infrastructure operators and transport authorities. It can also be extended to other asset types, such as tunnels or railway systems.

Related final deliverable(s) (Number(s) and title(s) to be included)	D.2.3.1 Report and presentation of BIM approach based on the conducted pilot action & D.2.3.2 Interactive digital twin model linked to the project platform & video presentation
Output web link (if applicable)	https://www.interreg-central.eu/news/bim4ce-is-implementing-novel-sens
GPS coordinates (if applicable)	X: 463.869,48 - Y: 105.497,40 - Z: 287,27