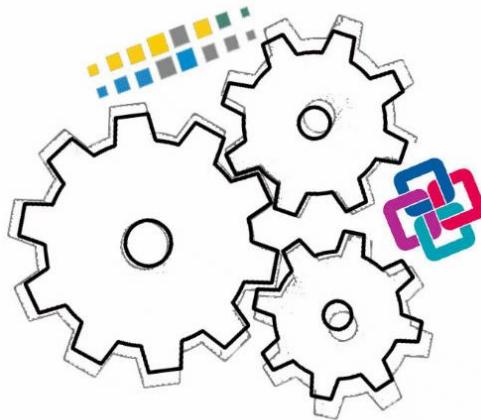


# The GeoBIM benchmark project



The [GeoBIM benchmark](#) is a 2019 Scientific initiative funded by the [International Society for Photogrammetry and Remote Sensing \(ISPRS\)](#) ([ISPRS Scientific Initiative 2019](#)) and the European Spatial Data Research association (EuroSDR) that has officially started.

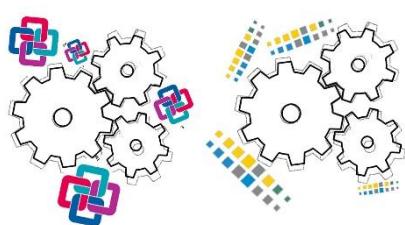
The project will investigate available **technical solutions** for the integration and interoperability of data concerning 3D geoinformation and 3D building information models (BIM).

This is the first project that will provide insight into the **state of implementations of the open standards** in the 3D geo and BIM domain, also identifying remaining issues.

## Objective

The main objective of the benchmark is to **provide a framework** describing the present ability of existing software tools to **use** (read and visualise, import, manage, analyse, export) **CityGML** (i.e. the main standard for 3D geoinformation) and **IFC** (i.e. the main standard for BIM) models and to measure their **performance** while doing so.

Three aspects of using and integrating 3D geoinformation and BIM data are examined in four tasks:



**Software support for the individual standards (CityGML and IFC)** within their respective domains – i.e. How well is CityGML supported by GIS (and other) tools and IFC by BIM (and other) tools?

- [Task 1](#) - Support for IFC within BIM (& other) software;
- [Task 3](#) - Support for CityGML within GIS (& other) tools;



Options for **IFC geo-referencing**.

- [Task 2](#) - Options for geo-referencing BIM data;

**Conversion procedures** CityGML ↔ IFC

- [Task 4](#) - Options for conversion (software and procedural) (both IFC to CityGML and CityGML to IFC).



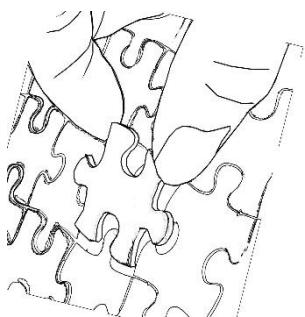
## The GeoBIM benchmark organizers

The initiative comes from the collaboration between the **ISPRS WGs IV/1, IV/2, IV/10** and **EuroSDR**.

F. Noardo (WG IV/2, TU Delft, NL), K. Arroyo Ohori (WG IV/1, TU Delft, NL), J. Stoter (EuroSDR, TU Delft, NL), C. Ellul (EuroSDR, UCL, UK), L. Harrie (EuroSDR, Lund University, SW), F. Biljek (WG IV/10, NUS, Singapore), T. Krijnen (TUE, NL), M. Kokla (WG IV/2, NTUA, Greece), G. Agugiaro (WG IV/10, TU Delft, NL) are the investigators leading the initiative. They will coordinate the activities; prepare the material, i.e. test datasets, results templates guiding the tests, calls for participation, website; encourage the participants to carry out specific tests and to use specific software; check the answers; analyse the results; eventually integrate them; outline conclusions and lead the results dissemination.

An **advisory board** will offer suggestions through the project, revise the intermediate and final reports, reflect on intermediate results (offline and during project meetings), help the dissemination of the call for participation and the results and the final reports.

## The Participants



**External voluntary participants** are a very important part of the initiative. They perform one or more tasks with the tools they are familiar with, and deliver their results in the provided results template.

This will allow us to **synthesise the efforts and individual experiences** with specific (technical) tools into build a common list of tools and their capabilities that are compared using clear criteria.

The participants will all **co-author at least one scientific publication** together with the benchmark proponents reporting the main results of the benchmark.

## The tested tools

The aim is to test the main tools that are used in practice, in order to provide the widest possible framework. Both off-the-shelf tools and self-programmed software will be considered, both proprietary and open source.

The tested tools will be finally **objectively described following the results of the tests, with a look at their specific features**.

No ‘winner’ nor ‘loser’ will emerge, but **scientific in-sight into their offered functionality will be gained**. For this reason, also software vendors and programmers are invited to participate, so that their tools are included in the benchmark.

## Benchmark Data

Three datasets are provided for each of the two investigated standards (IFC and CityGML):

- A small building model in Sweden (IFC);
- A big building model in the Netherlands (IFC);
- A set of specific geometries to test geometry features (IFC);
- A part of a multi-LoDs city model of Rotterdam (CityGML);
- A city model of the whole city of Amsterdam in LoD1 (CityGML);
- Some buildings in LoD3 to test LoD3 features (CityGML).

It is possible to see the full details of the use datasets in the [data description section](#) of the website.

Most of them are **data produced by practice**, therefore, although they were chosen also for their good quality, they are not specifically generated for the use of open standards. This represents a further challenge,.

For this benchmark it is important also to consider this aspect, in order to **provide a useful tool supporting the widest application possible** of open standards.

## The outcomes

1. A **reference list of tools** to be used for managing standard 3D models (features, performance, required procedures, settings and best practices clearly described and assessed in a unique framework).
2. The **outline of the present state of implementation** (how much has been done and how much is left) of spatial open standards. As the project will identify bottlenecks in the current status, it will encourage further development and use of open standards and increase spatial information interoperability.
3. The developed **material and test datasets (BIM and 3D geoinformation), answers and results analyses**, together with the report of the activity describing in detail the material, methods and results of the study, will be made available after the end of the initiative (as long as permitted), as reference or material for future improvements, new software tools, tests, continued benchmarking or other similar research.

## Benchmark events

Two main events will be organised for the benchmark:

### 1. July 2019 - Intermediate meeting of proponents and participants

In the meeting the intermediate results will be presented, discussed and disseminated. This will provide an opportunity to present the most promising workflows identified to date, propose their replication by other participants and to discuss eventual adjustments to the test datasets or further activities or developments.

### 2. December 2019 - GeoBIM benchmark winter school.

A final **winter school** will be organized at the end of the initiative to present the final results. It will be addressed to students, practitioners from industry and government, other interested parties and it will aim at disseminating the geoBIM topics connected to the benchmark results, and the results themselves.

It will be structured as follows:

- Educational component: IFC and CityGML open standards;
- Use Case presentation – highlighting situations where geoBIM is useful;
- Presentation of the benchmark and its results;
- Workshop outlining the most effective tools from the benchmark;
- Discussion and feedback, along with plans for future work.

**Website:** <https://3d.bk.tudelft.nl/projects/geobim-benchmark/>

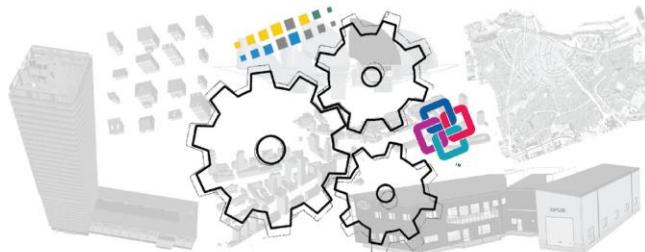
**Register now to participate:** <https://francescanoardo.typeform.com/to/lbdpZD>

**Call for Participation is open:**

# GeoBIM benchmark 2019

Study on software support for open standards of city and building models

This benchmark will investigate the available technical solutions to support research and activities related to **GeoBIM**, the **integration** of geoinformation with Building Information Models, through the use of the **open standards IFC** (by buildingSMART) and **CityGML** (by OGC).



1. What is the **support for IFC** within BIM (and other) software?



2. What options for **geo-referencing BIM** data are available?



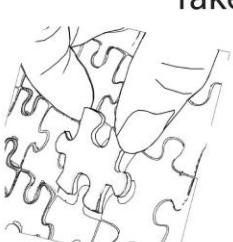
3. What is the **support for CityGML** within GIS (and other) tools?

4. What options for **conversion IFC ↔ CityGML** are available?



Visit the project website:

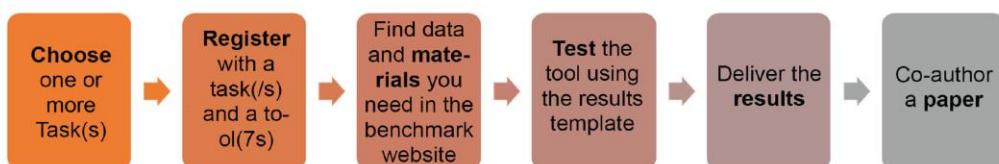
<https://3d.bk.tudelft.nl/projects/geobim-benchmark/>



Volunteers are welcome, using the tools they are familiar with, contributing to build a common reference list of tools for GeoBIM-related activities.

**Scientific publication** co-authored by benchmark proponents and volunteers will be written, and final results will be published on the website.

## How to participate



## Important dates:

Beginning of the activity and of the tests:

March 2019

Deadline for delivering results:

October 2019

End of the project and GeoBIM Winter School:

December 2019

**Register now:**

<https://francescanoardo.typeform.com/to/lbdpZD>

