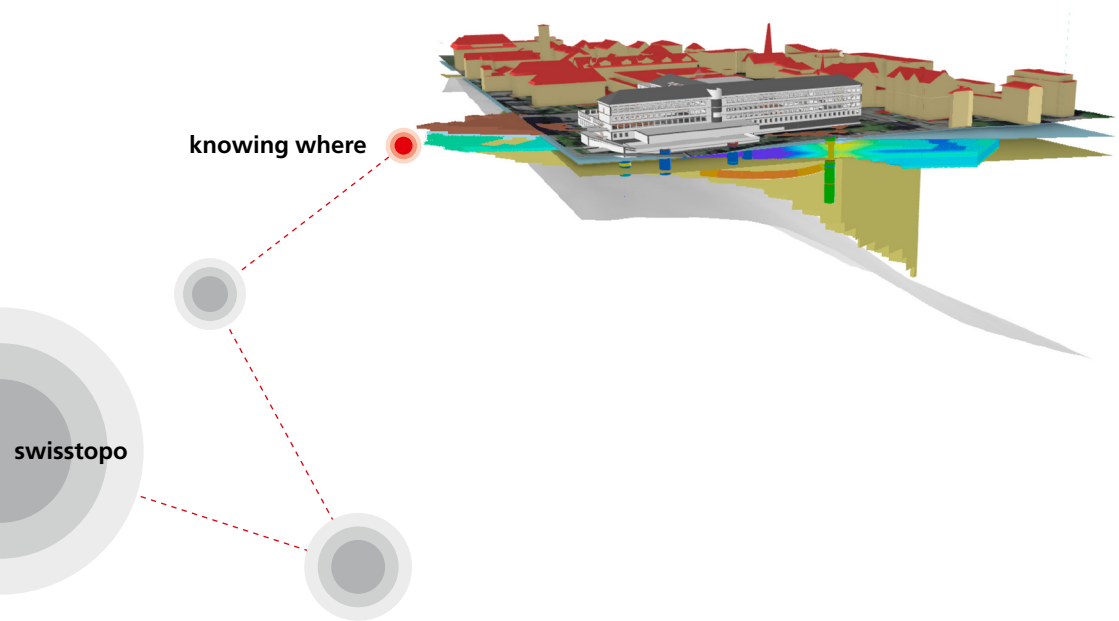


swisstopo geoBIM strategy



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1. Introduction

The geoBuilding information modelling (geoBIM) strategy of the Federal Office of Topography swisstopo is based on *swisstopo Strategy 2025*,¹ *swisstopo geoinformation strategy for Switzerland*² and the *cadastral survey strategy for the period from 2020 to 2023*.³

Buildings are always embedded in the real world, and this is why geodata are of such relevance for the depiction of the environment: geodata represent the real world.

The overlapping of building information modelling (BIM) and geoinformation systems (GIS) is frequently referred to as “geoBIM”. In this document, “geoBIM” is treated as an umbrella term which encompasses swisstopo’s core competencies.

¹ <https://www.swisstopo.admin.ch/en/swisstopo/vision.html>

² <https://www.geo.admin.ch/en/about-swiss-geoportal/task-and-responsibilities/strategy-and-implementation.html>

³ <https://www.cadastre.ch/de/manual-av/management/strategy.html>

2. Current situation

In the field of building information modelling (BIM) the situation is highly dynamic: on the one hand, the *Digital Switzerland Action Plan*¹ requires federal building and real estate organisations to plan, construct and operate their buildings using BIM by 2025. And on the other hand, swisstopo repeatedly receives requests to provide geodata for BIM processes.

Standardisation in the field of geoBIM has not yet been effected. The geoinformation sector has asked swisstopo to advocate for Swiss-wide harmonisation.

In addition, swisstopo supplies broad-ranging geodata as the basis for BIM. In this context the question arises as to which data should be made available.

swisstopo (and the entire geoinformation sector) is experienced in the development of geodata models as well as in the field of standardisation. It would be possible to also utilise geoBIM know-how to the benefit of the whole of society.

Because BIM data are often highly detailed, it would be very useful if they could be directly integrated into geodata. The necessary principles for this would have to be clarified. In its “national borders” pilot project, swisstopo already obtained findings relating to the collaborative input and updating of data.

¹ https://www.bakom.admin.ch/dam/bakom/de/dokumente/informationsgesellschaft/strategie2018/Aktionsplan%20Digitale%20Schweiz.pdf.download.pdf/Aktionsplan%20Digitale%20Schweiz_DE.pdf

swisstopo has experience in working together with the cantons, and already provides the private sector with geo-data-based services such as data processing and acquisition. It would therefore be possible to make direct use of this experience.

Furthermore, swisstopo is able to apply its experience with the BIM Laboratory and the GEOL_BIM project of the Swiss Innovation Agency (Innosuisse) at the Mont Terri rock laboratory. The availability of geological and geotechnical data, in combination with building data, means that exciting opportunities can be opened up for experiments there. The findings could also be of interest to armasuisse Real Estate.

3. Vision and strategic orientation

3.1. Vision

The aim is for swisstopo to position itself as the federal government's competence centre for geoBIM.

3.2. Strategic orientation

swisstopo is to advocate for geoBIM standards to be uniformly implemented in Switzerland, so that clients throughout the country can obtain harmonised, high-quality data.

swisstopo is to place geodata at the disposal of clients so that the data can also be readily and conveniently used with BIM applications. We attach a great deal of value to machine-readable exchange formats and open BIM.

4. Fields of action

Based on its vision and strategic orientation, in the field of geoBIM swisstopo is to focus on the following areas of activity:

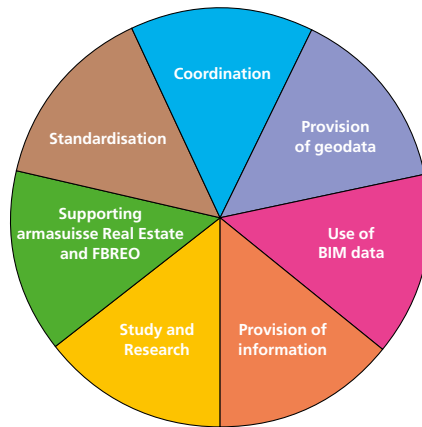


Figure 1:
swisstopo's areas of
activity in the field
of geoBIM

Activity	Description
Provision of geodata	Processing and provision of geodata for use in BIM projects, whether as downloads or via a dedicated service.
Use of BIM data	Use of BIM data for updating geodata. Clarification of potential data sources, quality assurance (IFC ¹ data checker) and delivery of data.
Provision of information	Provision of information both internally and externally concerning developments in the field of geoBIM.
Study and research	Obtaining findings, and developing and testing methods and data models. Participation at advanced education events.
Supporting armasuisse Real Estate and (FBREO) ²	Supporting armasuisse Real Estate and federal building and real estate organisations in the fields of geoBIM and BIM with respect to projects, programme management and data governance.
Standardisation	Advocating for (international) standards and harmonised data quality in order to simplify the use of data throughout the country.
Coordination	Coordination of geoBIM activities in the federal administration and within swisstopo. Coordination and networking with the cantons and fostering other geoBIM activities.

¹ IFC: Industry Foundation Classes, an open format for BIM data

² FBREO: federal building and real estate organisations

5. Measures

The measures listed below incorporate the BIM measures defined in *swisstopo Strategy 2025* and additions where necessary.

Measure	Activity	Duration	Description of measure <i>(In italics = defined in swisstopo Strategy 2025)</i>
swisstopo is to specify potential services and tasks based on the principle of the BIM strategy of the federal building and real estate organisations.	Supporting armassuisse Real Estate and FBREO	End of 2022	<i>swisstopo is ready to position itself as the federal government's data and service centre (possibly via the GCG¹) for BIM data and supply lines.</i> <i>(Similar to measure G5.1 in swisstopo Strategy 2025)</i>
	Coordination		
swisstopo is to monitor BIM developments and examine the possibility of providing selected geodata in the corresponding standards.	Provision of geodata	End of 2022	<i>swisstopo is to assist with the coordination and standardisation of interfaces between BIM data and geodata.</i> <i>(Identical to measure G4.2 in swisstopo Strategy 2025)</i> <ul style="list-style-type: none"> • Identification of the requirements of data users • Workshop in week 25 • Development and provision of swisstopo products for use with BIM
swisstopo is to clarify the distribution of the tasks and duties of the geoBIM management process with the involved organisations (geoBIM steering committee, the CGC, ² federal building and real estate organisations, IGS, ³ the Association of Swiss Architects and Engineers, Digital Construction Switzerland). swisstopo is to advocate for standardisation in Switzerland, including the necessary financing.	Coordination	End of 2023	<i>swisstopo is to assist with the coordination and standardisation of interfaces between BIM data and geodata.</i> <i>(Identical to measure G4.1 in swisstopo Strategy 2025)</i> <ul style="list-style-type: none"> • Participation in the National geoBIM Coordination Group. • Clarification of the patronage of the CGC.
	Standardisation		
Together with the CGC, swisstopo wants to initiate the uniform implementation of the building and land cover data of the cadastral survey in a suitable BIM format.	Provision of geodata	End of 2023	<i>swisstopo is to assist with the coordination and standardisation of interfaces between BIM data and geodata.</i> <i>(Identical to measure G4.3 in swisstopo Strategy 2025)</i> Participation in the "geofutur" workgroup of the CGC (since February 2022).

¹ GCG: Federal Geoinformation Coordination Group

² CGC: Conference of Cantonal Geoinformation and Cadastral Survey Directors

³ IGS: Swiss Surveyors

swisstopo is to support the efforts on the part of industry and science partners who aim to make geological data compatible with BIM.	Provision of geodata	June 2022	As a partner in the implementation of the Innosuisse GEOL_BIM project, swisstopo is responsible for the development of data models (reference and transfer models) and the realisation of transformers, so that geological data can be provided in accordance with the needs of the geology sector in an open BIM format, and visualised and analysed together with building data. (Similar to measure M5.2 in <i>swisstopo Strategy 2025</i>)
	Standardisation		
swisstopo is to conduct research on geoBIM via its own projects.	Study and research	Ongoing	BIM laboratory GEOL_BIM Mont Terri rock laboratory (pilot gallery 18): use of geological and geographic data for BIM, integration of geotechnical sensors into a digital twin.
Participation by swisstopo at conferences and workshops.	Study and research	Ongoing	Attendance at conferences, making swisstopo visible and simultaneously taking suggestions from the sector on board.
	Coordination		
swisstopo is to share its geoBIM expertise both internally and externally.	Provision of information	Ongoing	Organisation of, and/or support for, information events such as the geoBIM Colloquium and the Geologists BIM Day. Publication of articles in <i>geodata news</i> and other scientific journals. Organisation of the CGC Workshop.
swisstopo is to deliberate on the framework conditions for the use of BIM data with respect to the updating of geodata.	Use of BIM data	From 2024	Formulation and documentation of deliberations (regarding quality assurance, “Swiss profile”, etc.). IFC data checker to be implemented and tested.
swisstopo is to cooperate on the standardisation of IFC or other BIM data formats for geodata.	Standardisation	From 2023	<ul style="list-style-type: none"> • Co-determination of a Swiss standard for cadastral survey data with respect to BIM. • Taking account of the application of international standards for other geodata sets.
Analysis of cantonal data packages for BIM	Study and research	From 2023	Monitoring the implementation of geoBIM in the cantons. Obtaining findings for specifying the requirements concerning BIM data that swisstopo wants to use or provide.
	Use of BIM data		

Definitions

geoBIM

Because buildings are always embedded in the real world, geodata are of relevance for the depiction of the environment. Geodata represent the real world. The term “geodata” not only refers to classical geographic data such as 3-D building models, terrain and surface models, public-law restrictions on landownership, land cover data, utility asset maps and zoning plans, but also encompasses all data with a spatial context, i.e. population distribution, tax rates, traffic data, etc. The overlapping of building information modelling (BIM) and geo-information systems (GIS) is frequently referred to as “geoBIM”. But this term is not sharply defined – it also encompasses various other aspects:

- Data interfaces between BIM and GIS
- Use of BIM models instead of plans on building sites, especially when precise positioning is essential, for example in the case of staking-out activities
- Geo-referencing of projects, for example via a transformation of local coordinate systems with origin 0.0.0 into national coordinates.

BIM method

Reference is frequently made to the BIM method in Switzerland. This term refers to an overall working method that focuses on cooperation, collaboration and communication, and suitably adapted processes in the construction industry. Here, BIM supports the provision to all parties involved in the construction process of the necessary and up-to-date information from a central location, where it can be entered, processed, verified and downloaded. All this takes place through the use of digital technologies. This method minimises redundancies, as well as in some cases information losses.

Building information model

A building information model differs from classical construction methods with the aid of CAD software in that buildings are depicted as volume models, and relevant data are then added. Here, for example, a wall may be allocated a thickness, a material and a fire protection classification. These features can then be used for various purposes, e.g. making cost calculations. In most cases, a BIM depicts a future development, i.e. it models something that does not yet exist in the real world. Although in the context of BIM we often think only of buildings, this new form of activity based on an increased level of cooperation also encompasses civil engineering and infrastructure development.



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