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Swiss Geoinformation Strategy

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1 Management Summary

Interlinked and Geolocated Information for Switzerland

Geoinformation is becoming increasingly important for decisions in politics, the economy, civil society and everyday life. Geoinformation, as a part of digitisation, is accelerating the transition to a knowledge society. In addition, digitisation increases the availability and versatility of spatially referenced data, giving users new opportunities to gain relevant knowledge from data.

Together with all stakeholders, the “Swiss Geoinformation Strategy” aims to make reliable, detailed, up-to-date and interoperable geoinformation accessible. It should be made available to all users in a simple, interlinked manner and, where appropriate, in real time. The geoinformation ecosystem thus contributes to the protection of space and the environment, to the safeguarding of social interests, to an efficient economy and to a stable government.

Seven fields of action define the main trends in geoinformation activities for the coming years:

- **Promoting the geoinformation ecosystem** as a joint effort between authorities at all levels of government as well as business, science, civil society and politics through coordinated cooperation and active dialogue
- **Providing suitable, reliable and linkable geodata** in a usable and long-term form for all users
- **Facilitating business processes** by integrating the spatial reference based on continuous, automated processes and focused on the needs of the users
- **Developing and benefiting from geodata science** by expanding expertise in spatial data analysis and the development and use of algorithms
- **Encouraging innovation** with clear frameworks and processes so that new ideas, approaches and concepts can be tested and implemented
- **Building and strengthening skills** in understanding geoinformation, shaping change among specialists and spreading knowledge about the use of geoinformation
- **Creating powerful, open and shareable digital geo-platforms** based on standardised and interlinked geodata, geoinformation and geoservices

In the geoinformation ecosystem, the consolidation of the National Spatial Data Infrastructure, which is already underway, will be continued, evolving into a collaborative platform on which data is jointly produced and shared. The platform enables and accelerates the creation of new knowledge relating to our living space.

The “Swiss Geoinformation Strategy” is in line with, among other things, the “Digital Switzerland Strategy” (2020), the “Swiss eGovernment Strategy” (2020) and the “Cantonal Guidelines on Digital Administration” (2018) as well as the 2030 Agenda. The strategy is aimed at politicians, the administration at all levels of government and the economy and civil society. It should also serve as a reference for organisations as well as private and public law companies which are involved in implementation. As the authors of the strategy, the Federal Council and BPUK (Conference of Cantonal Directors of Construction, Planning and the Environment) provide the strategic orientation. Implementation is the responsibility of the competent authorities at a federal, cantonal and municipal level. The measures for achieving the goals are defined in close cooperation between the Confederation, the cantons and with the involvement of the cities and municipalities as well as representatives from business, education and research.

2 Context

2.1 Geoinformation as a common good

In Switzerland, space and resources are finite. As a society, we are obliged to manage and shape our living space in a sustainable manner. We want to decide what this space should look like and what function we want it to have. The stakeholders influence each other and together they must find solutions to current and future challenges. This does not just apply to experts. The population also wants to know what is happening in their villages, towns and regions, where it is happening and what effects it has on their lives, their health and on the environment. Geographical space is a limited commodity of general interest.

More than just data is required for the coordinated shaping of living space: what is needed is the necessary knowledge. One of the greatest challenges for the geoinformation community will be to provide not just data but above all the ability to decide in a relevant, objective and interest-neutral manner, for all citizens, for the administration, for the economy and for science.

In the digital age, geographical space is increasingly being represented in digital form, to a certain extent as a “digital twin”. The better the description of geographical space and the integration of digital technologies, the more useful the knowledge gained from linking these two aspects. This expands on our ability to make decisions and helps us to improve processes.

Within two decades, spatial information has become an important component of spatial planning policy at all administrative levels (federal, cantonal, municipal). This has been made possible through ever broader thematic support, qualitative improvements and better integration. High-quality, up-to-date, shared and interoperable geolocalised information is indispensable for the development, analysis and monitoring of political processes and is also widely used in the private sector.

2.2 Mandate of the Federal Council

Switzerland should consistently exploit the opportunities of digitisation in order to make its living space sustainable and more attractive and to be able to assert itself as an innovative, future-oriented business and research location.

Economic, political, strategic and administrative decisions are often made on the basis of computer-based models of reality which are, in turn, usually based on digital location data. Geodata and geodata flows are becoming more extensive, are increasingly available in real time and are ever more frequently the focus of a modern state’s management tasks. In view of this, certain tasks of the state (and its administration) with regard to geoinformation must be reconsidered, namely the guarantee of procedures, measures and data quality. It is no longer just a matter of obtaining, analysing, processing and publishing spatial data. It is a matter of enriching this data by linking and exchanging it, via platforms, as information and knowledge among citizens, authorities and companies.

The Federal Council commissioned the Swiss Federal Office of Topography, swisstopo, in consultation with the Swiss Federal Coordination Body for Geoinformation, to revise the Geoinformation Strategy by the end of 2020 and to present implementation measures.

2.3 Basis and Recipients

This strategy is in line with and complements the following guidelines and strategies:

- Digital Switzerland Strategy (2020)
- Swiss eGovernment Strategy (2020)
- Swiss Federal IT Strategy (2019)
- Open Government Data Strategy (2018)
- Strategy and concept for the development of common master data management at federal level (2018)
- Target vision for the digital transformation within the Federal Administration and the development of digital infrastructures (2018)
- Cantonal Guidelines on Digital Administration (2018)

- 2030 Agenda

The strategy builds on or replaces the first “Strategy for Geoinformation in the Confederation” (2001). Among other things, this formed the basis for the Geoinformation Act (GeolA). Since 2008, Switzerland has been one of the first countries in the world to legislate of the entire field of geoinformation. This act created the basis for the joint development of spatial data infrastructures at a federal, cantonal and municipal level.

The strategy is directed at politics, civil society and the administration. On the administration side, these are the federal, cantonal and municipal administrations. The strategy should also serve as a reference for non-governmental organisations as well as for private and public-law companies which are involved in implementation.

2.4 Geodata Infrastructures

A geodata infrastructure (GDI) is a system of policies, institutional facilities, technologies, data and people. A GDI enables the sharing and efficient use of geospatial information.

A key factor in the success of the implementation of the GDI was the development of a network of contacts between federal agencies, cantons, business, research and educational institutions. Via this contact network, geoinformation was introduced beneficially as a cross-sectional task in many areas. As data infrastructures are becoming increasingly interconnected, combining and supplementing them with data and information from other fields is becoming ever easier.

The new strategy aims to strengthen the geoinformation ecosystem so that it continues to play a pioneering role in the digital transformation. In this ecosystem, all stakeholders jointly provide services for the benefit of the users. They are themselves part of the ecosystem. Individual core competencies in the field of geoinformation are to be brought together in a user-oriented and needs-based manner which goes beyond the organisational structures. The system is open and exceeds the individual boundaries of the participants. These connections, as well as free access to information, make a fundamental contribution to the functioning of our society. The network offers opportunities for product, process and organisational development which are not available to individual partners in isolation.

2.5 From Data Provision to Knowledge

The first strategy for geoinformation led to all parties involved making great efforts to provide federal geodata in a standardised and harmonised form. In Switzerland today, several thousand spatial topics are accessible via the Federal Spatial Data Infrastructure (FSDI) and the cantonal or municipal GDI. Web services, application programming interfaces (APIs) and internet portals register millions of queries every year, with growth rates in double digits. The fact that more and more geoinformation is being communicated ever faster does not automatically mean that it is being communicated better. The Geoinformation Strategy pursues the goal of making a significant contribution to knowledge about our world and thus to better meeting the social, economic and ecological challenges.

Those who drafted the strategy propose that the geoinformation ecosystem should evolve step by step: from providing data to using geoinformation, from linear processes to interactions, from describing to predicting, from “push” supplier to “pull” user (white paper - “Towards a Spatial Knowledge Infrastructure” of March 2017). Thanks to the co-production of data, the active exchange of information, the use of artificial and collective intelligence and the building of bridges to related methods (geodesign, building information modelling (BIM), Big Data, etc.), users have promising approaches at their disposal that need to be activated. The next step is to facilitate the use and integration of data and information so that all stakeholders can generate new knowledge fundamentals together, as partners.

3 Vision and Goal

3.1 Vision

From geodata to knowledge: interlinked and geolocated information for Switzerland

The linking and geo-referencing of information creates digital fact-based geo-knowledge. It enables sustainable decisions for a liveable, open and progressive Switzerland.

3.2 Goal

In order to make the best possible use of the opportunities arising from the digital transformation for the environment, civil society and the economy, for the benefit of all and to master the challenges ahead, there is a continuing need for the broad, shared use of geoinformation. To this end, its collection, preservation, dissemination, reuse and analysis will be promoted.

The ongoing consolidation of the National Spatial Data Infrastructure (NSDI) is to be continued with standardised interfaces and simple, central access to geoinformation (NSDI 2.0). In parallel, its development towards a network of collaborative platforms for the co-production and sharing of geodata and services (NSDI 3.0) will be monitored. Through these platforms, the emergence of useful new knowledge related to our living space will be accelerated. This can lead to a spatial data infrastructure based on collective intelligence that transcends national borders (NSDI 4.0).

4 Basic principles

The strategy is based on seven basic principles, following the “Tallinn Declaration on eGovernment” policy. They form the framework for achieving goals in the fields of action and serve as a guide for future activities within the geoinformation ecosystem.

User centricity Stakeholders seek user-centric solutions and implement them together so data, information and services can be shared in a user-friendly, standardised and resource-saving manner.

Digital by default Processes are digitally imagined, designed end-to-end and automated from the outset so that digitalisation progresses. Basic services are provided with suitable performance and availability, taking into account a responsible approach to digitalisation.

Once only Geodata sets are organised in such a way that citizens, businesses or other authorities only have to enter them once. They can then be used several times in a suitable form via common platforms.

Transparency In the spirit of the Open Government Data strategy, data is generally available in machine-readable and open formats for free reuse, provided this is legally permissible. Transparent processes and algorithms are ensured.

Trust The protection of personal data, data security, data quality and the traceability of processes in the creation, administration, processing, distribution and use of geoinformation must be guaranteed. Individuals and companies can view their personal data held by the administration and, where appropriate, manage it themselves.

Access	In principle, services are available to all users without restriction. Any restrictions are justified. Users are part of the freely accessible ecosystem.
Interoperability	Data, processes and algorithms are organised and documented according to norms and recognised open standards. They can thus be used easily and in the long term across hierarchical and siloed structures.

5 Benefits of geoinformation

5.1 Part of the Digital Society

Geoinformation, with its practical and strategic importance, is a field in its own right. It plays a connective and future-oriented role in the development of digital society and is an essential element of our national infrastructure, comparable to the transport and communication networks.

The transformation of our living space and the development of digital technologies are two interrelated phenomena. Digitalisation facilitates the provision of information from different stakeholders to solve increasingly complex tasks.

More and more physical objects or phenomena have a – usually geolocalised – digital counterpart. Spatial data and data streams are multiplying, are increasingly available in real time and are central to contemporary use of spatial data.

Just as Switzerland as a country extends over a certain area, “Digital Switzerland” is giving rise to new digital spaces. These must be understood, modelled, mapped and regulated so that knowledge can be gained from them for us as a society.

5.2 Sustainable Development

Geoinformation contributes to the implementation of the 2030 Agenda for Sustainable Development. Sustainable development requires data so developments can be assessed, goals set and measures planned. Policy instruments and the sustainable management of spatially effective activities (e.g. spatial development, mobility policy) also depend on information flows. Geoinformation can contribute to sustainable development and provides useful information to policy-makers and the public. Nevertheless, the risks of increasingly data-based decision-making need to be considered, such as insufficient traceability in computer-based conclusions.

5.3 Diversity

Geoinformation is needed at all levels of administration, in the economy, in science and by citizens. It provides the basis for scientific analysis and planning. Its availability is an important prerequisite for fact-based results and for location and investment decisions.

Geoinformation is becoming increasingly important in areas such as spatial development, telematics, mobility, energy, environmental protection and nature conservation, health care, agriculture and forestry, land registry, cadastre, national defence, internal security, civil defence, supply and disposal, private companies and tourism.

5.4 Geoknowledge: Help with Everyday Decisions

Every day we make thousands of decisions. 60 to 80 percent of decision-making processes in the public sector involve spatial issues. Geoinformation provides us with an important basis for making and communicating decisions more easily. Often, spatial knowledge is already available in digital form via various instruments and applications, enabling us to find and navigate to the right place, to optimally align our actions with space or to create a schedule thanks to predictions.

Geoinformation enables the modelling and analysis of current, past or future spatial relationships, taking into account numerous human, social, economic and natural factors. Geoinformation is a key element of the knowledge society and therefore indispensable.

5.5 Participation in Public Debates

Geoinformation is a democratic instrument which supports public debate. It enables citizens to participate in important social and political processes because it provides visibility and explanations of the effects planning decisions can have on living space, the environment, infrastructure and people. This is important in a densely populated country like Switzerland where every decision and every action can have an impact on many people and facilities. Transparent and informed decisions in politics, business and society would be inconceivable without geodata. It increases confidence in government action, provides greater legal certainty and is indispensable in government activity.

5.6 Security

Geoinformation plays an increasingly important role in improving security and defence. In the event of natural disasters and health or social crises, geoinformation supports first responders upfront by providing them with accurate real-time data and useful information. Advances in data analytics and new functionalities, as well as interoperability, mean that geospatial data can be widely used for security and defence purposes, from reconnaissance and detailed analysis of changes in affected regions to strategy development. Reliable geoinformation and services with high added value are essential for ensuring our security.

5.7 Switzerland as a Business Location: Geoinformation Serving the Economy

Geodata holds immense economic potential because almost every object in the world is located and timed. In almost all contexts, the questions of “Where?” and “When?” arise at some point. Time-related geodata or geodata flows form the basis for strategic decisions by companies, for the optimisation of business processes and for the development of products and thus offer great innovation potential.

Companies benefit from geoinformation, for example when choosing a company location, to adapt the offer to local conditions, to localise the customer base or to optimise procurement and distribution. Whether a question of suitable routes, the mineral composition of the subsoil or the localisation of sources of pathogens: whenever the question “What is where and when?” is asked, geoinformation can provide answers.

6 Fields of Action

Fields of action define the main trends of geoinformation activities for the coming years. These activities are intended to achieve positive impacts that maximise the benefits of geoinformation.

6.1 Promoting the Geoinformation Ecosystem

The geoinformation ecosystem is a joint effort between the public authorities at all levels of government, business, science, civil society and politics. Partnerships are essential for shared geoinformation. This common commodity forms the basis of the present strategy. The development of our society over the course of digital transformation requires more detailed and up-to-date geoinformation. This makes it all the more important to work in partnership, including with other national or international initiatives, so that knowledge and production are bundled together and cooperation is strengthened. Understanding our specific needs and requirements moves us forward – together.

Goal The Confederation, in cooperation with the cantons and municipalities, ensures as a sovereign task that the authorities' relevant geoinformation is available at all times. The agile and user-oriented approach as well as active dialogue with other sectors enable effective cooperation and the efficient use of resources.

6.2 Linking Geodata

A modern state needs suitable, reliable and interoperable geodata. Technical development, crowdsourcing, a wide variety of sensors and data networks are opening up new data sources. Data is becoming increasingly diverse and interconnected. For optimal use, adequate data transfer is gaining in importance. Semantic interoperability and linked data should enable machines to act on demand and to find and collect information. Software agents should be able to suggest answers based on user-defined tasks.

Goal Users have access to time-defined, official, harmonised geodata from the authorities, in a comprehensible, user-friendly and usable form in the long-term. This linkable geodata covers the entire territory with a sufficient spatial and temporal resolution. The data is made easy to find and linkable with itself and with other data by means of catalogues, common semantics and suitable forms of publication for humans and machines.

6.3 Facilitating Processes

As a cross-sectoral resource, geoinformation helps us to overcome structural obstacles for the benefit of users. With the integration of spatial references, many processes can also be simplified, new opportunities exploited and better results achieved. Geoinformation should be easy to integrate into the business processes and life situations of the users. Automated and integrated business processes accelerate processing, improve transparency, increase economic efficiency, ensure quality and relieve the burden on the process participants. Successful process design is based on the user's perspective and not on organisational structures.

Goal Users should be able to use geodata and geoinformation easily and integrate this into their business processes. Suitable tools and simple, open, scalable, automated and user-friendly interfaces are available.

6.4 Developing Geodata Science

Users are primarily interested in knowledge which provides them with a basis for their decisions. Geoinformation should increasingly provide user-relevant knowledge in an automated way.

Data volumes are becoming more and more extensive, heterogeneous and complex. In this context, needs are less about processing data and more about developing algorithms. In order to fully exploit the potential of geodata, new interdisciplinary methods from data science must be understood and introduced where useful. This requires the development and sharing of new expertise, powerful infrastructures and the redefinition of framework conditions (quality, data protection, transparency).

Goal New expertise in spatial data analysis and the use of algorithms is developed and shared. The inclusion of data science approaches and methods ensures that the needs of users are met. Current developments in digitalisation are to be monitored and assessed in terms of their impact.

6.5 Promoting Innovation

The capacity for innovation is one of Switzerland's strengths. Innovation through and for geoinformation should make a decisive contribution to sustainable development and thus improve our living conditions. As a cross-sectoral issue, geoinformation is an important accelerator and multiplier for the emergence of innovations that affect and combine many areas of activity.

Goal Clear framework conditions, processes and incentives are created so that new ideas, approaches and concepts can be tested in the geoinformation ecosystem and new organisational, procedural or technological possibilities can be explored.

6.6 Build and Strengthen Competencies

Addressing the major challenges related to our environment, space and society requires specific knowledge of the phenomena which occur there. High-quality geoinformation, specialised knowledge and a good command of the methods and technologies involved are essential.

With the development of information technology, collective intelligence is becoming more important. Underlying it is a horizontal model based on collaboration, different from the existing vertical structures. Society needs competence which is adaptable and can trigger and manage change, innovation and creativity; competence which promotes teamwork is able to use knowledge for decision-making and can communicate it. It is important for all citizens to be able to actively participate in political, social, cultural and economic processes and assess the impact of their actions.

Goal The education and training of geoinformation professionals is ensured. At the same time, competencies related to collective intelligence as well as to shaping change will be promoted. In addition, knowledge about the use of geoinformation is to be included in the general curriculum and explored in greater depth in related specialist topics.

6.7 Develop Digital Platforms

In order for geodata and geoservices to be produced and used effectively and efficiently, the stakeholders in the geoinformation ecosystem must better pool their resources. At the heart of digital ecosystems are one or more platforms for integrating a wide range of systems, data and services. If these connections are used, added value can be generated jointly for the users. One of the expected added values is that changes in reality can also be reflected digitally in a timely manner.

The success of a digital platform does not depend primarily on the technology but rather on the acceptance of the platform by the users and on the cultural change of the stakeholders involved. Digital platforms overcome inhibiting, traditional organisational structures, silos, guidelines and technology investments. They thus enable new ways of collaboration and operation.

Goal To build, operate and further develop powerful and reliable, open and shared platforms. These platforms are based on standardised and networked geoinformation and geoservices. This guarantees the timely (just in time) collection, management, sharing, use and analysis of harmonised geodata. This closes the gap between data collection and subsequent use.

7 Effects

The fields of action have multiple effects due to mutual dependencies and overlaps. Seven expected impacts summarise the effects:

Decision-making	Support in our daily decision-making with helpful, easily accessible bases.
Reliability	Access to reliable, harmonised, nationwide geodata via reliable powerful interfaces.
Linkability	Easy linking of non-spatial data with geodata and facilitated networking via open and standardised geoservices and common platforms.
Agility	Leadership and a participatory as well as agile approach fostering collective intelligence for knowledge generation and improving resilience capacity.
User satisfaction	A better integration of all users for the consideration and satisfaction of their needs.
Versatility	Wide-ranging, well-described geodata, services and an information pool for versatile use.
Preservation of value	Preservation of the common heritage and long-term availability of geodata, geoinformation and knowledge as well as the necessary interfaces.

8 Future Course of Action

8.1 Policy Guidelines

The Federal Council and BPUK (Conference of Cantonal Directors of Construction, Planning and the Environment) define the “Swiss Geoinformation Strategy”.

The Confederation, cantons and municipalities as well as all other partners (e.g. business, science, politics, citizens) are committed to the “Swiss Geoinformation Strategy” and support its implementation.

The Confederation and the cantons will implement the strategy in close cooperation. They jointly provide the necessary resources for its implementation, sustainability and long-term development.

In order to ensure legal certainty and long-term investment protection, legislative amendments are being examined and, if necessary, initialised.

The Confederation is active in higher-level national and international bodies dealing with geoinformation issues.

8.2 Implementation

Responsibility for the implementation of this strategy lies with the Coordination Body for Geoinformation of the Confederation (GKG), supported by Coordination, Geoinformation and Services (COGIS) of swisstopo, in cooperation with the cantons via the BPUK, supported by the Conference of Cantonal Geoinformation Offices KKGeo (from 1.1.2021 Conference of Cantonal Geoinformation and Cadastral Offices KGK) and with the involvement of the cities and municipalities. The GKG coordination body reports annually to the DDPS.

As an instrument for the implementation of the present strategy, an action plan with implementation goals and measures will be drawn up together with experts from all administrative levels as part of a continuous planning process.

The GKG and COGIS, BPUK and KKGeo bodies designated for this purpose are responsible for coordination with other cross-sectional and specialised topics.

9 Further information

[2030 Agenda](#)

[Federal Act on Geoinformation \(Geoinformation Act, GeolA\)](#)

[Swiss eGovernment-Strategy 2020–2023](#)

[Federal ICT Strategy 2020–2023 of April 2020](#)

[Cantonal Guidelines on Digital Administration of 27 September 2018](#)

[“Digital Switzerland” Strategy of 11 September 2020](#)

[Strategy for Geoinformation in the Confederation of 04.2001](#)

[Strategy for open administrative data in Switzerland 2019-2023 of 30 November 2018](#)

[Strategy and concept for the development of a Federal common master data management of 19 December 2018](#)

[Tallinn Declaration on eGovernment at the ministerial meeting during Estonian Presidency of the Council of the EU on 6 October 2017](#)

[White Paper Towards a Spatial Knowledge Infrastructure of March 2017](#)

[Target vision for the digital transformation within the Federal Administration and the development of digital infrastructures of January 2019](#)