

# LIFO: Location Interoperability Framework Observatory

2020 COUNTRY FACTSHEET  
SWITZERLAND



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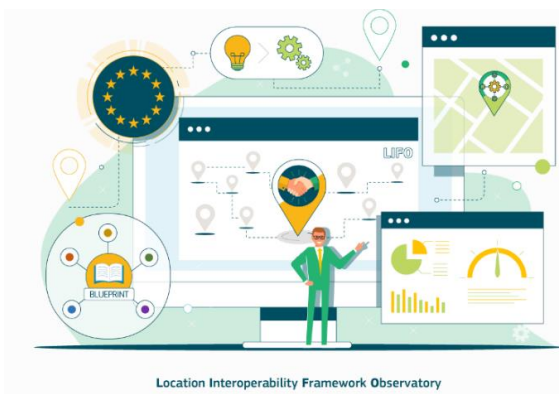
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(Geo-)information for everyone: Spatial knowledge with multiple purposes of use in Switzerland.

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# 1. Introduction



The Location Interoperability Framework Observatory (LIFO<sup>1</sup>) monitors the implementation of location interoperability good practices in European public administrations.

The monitoring is based on the level of adoption of the recommendations set out in the five focus areas of the European Union Location Framework (EULF) Blueprint<sup>2</sup> (see [Figure 1](#)).

The EULF Blueprint provides guidance for implementing the European Interoperability Framework (EIF)<sup>3</sup> in the geospatial domain.

Consequently, the LIFO complements the EIF monitoring mechanism operated by the National Interoperability Framework Observatory (NIFO)<sup>4</sup>.

LIFO is coordinated by the European Location Interoperability Solutions for e-Government (ELISE)<sup>5</sup> action in the Interoperability Solutions for European Public Administrations, Businesses and Citizens (ISA<sup>2</sup>)<sup>6</sup> programme.

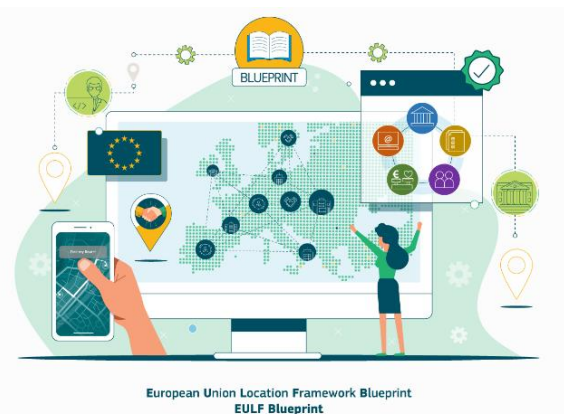


Figure 1 - EULF Blueprint focus areas

<sup>1</sup> <https://joinup.ec.europa.eu/collection/elise-european-location-interoperability-solutions-e-government/solution/lifo-location-interoperability-framework-observatory/about>

<sup>2</sup> <http://data.europa.eu/w21/8e942bc2-657a-4289-b057-f2a285ee7375>

<sup>3</sup> [https://ec.europa.eu/isa2/eif\\_en](https://ec.europa.eu/isa2/eif_en)

<sup>4</sup> [https://ec.europa.eu/isa2/solutions/nifo\\_en](https://ec.europa.eu/isa2/solutions/nifo_en)

<sup>5</sup> <https://joinup.ec.europa.eu/collection/elise-european-location-interoperability-solutions-e-government/about>

<sup>6</sup> [https://ec.europa.eu/isa2/home\\_en](https://ec.europa.eu/isa2/home_en)

The LIFO data collection is carried out through an online questionnaire sent to country representatives for digital government in the geospatial domain. The questionnaire is based on the LIFO analytical model<sup>7</sup>. This model is composed of primary indicators, calculated using information provided by respondents to the online questionnaire, and secondary indicators, reusing information from existing sources, for example, the monitoring under the INSPIRE Directive<sup>8</sup>. The indicators address good practices in the provision and use of location data in digital government and are shaped by the European policy context. They include measures relating to several EU directives and regulations including, for example, required datasets and means of access under both the INSPIRE Directive and the Open Data Directive<sup>9</sup>, obligations under the General Data Protection Regulation (GDPR)<sup>10</sup>, approaches under the Public Procurement Directive<sup>11</sup>, and factors relevant to the EIF<sup>12</sup>.

LIFO involves participating countries that are either EU Member States or other countries implementing the INSPIRE Directive. Results for the non-EU Member States, which apply EU legislative provisions on a voluntary basis, have their own alternatives, or apply the provisions only for specific aspects, must be read taking this into account.

The first LIFO data collection was in 2019 and the second in 2020. The LIFO 2020 model improves the monitoring capabilities of the model used in 2019, while being substantially aligned with it.

LIFO results are published on Joinup (see [Figure 2](#)) in the form of *Country factsheets*<sup>13</sup> and a *European State of Play Report*<sup>14</sup> and are available for users to explore in the *LIFO interactive dashboards*<sup>15</sup>, which are linked in their turn to the *EULF Blueprint*<sup>16</sup>.



Figure 2 - LIFO online resources

<sup>7</sup> See [Annex 1](#) for the scoring methodology used in the model and [Annex 2](#) for a list of indicators

<sup>8</sup> See <https://inspire.ec.europa.eu/inspire-directive/2>. As reported in the EULF Blueprint, “Geospatial or location interoperability has been a major feature of both the ISA2 Programme and the predecessor ISA Programme. There was a strong basis for this with the adoption and implementation of INSPIRE. INSPIRE has driven forward the implementation of harmonised pan-European geospatial data for European environmental policy, and has paved the way to stronger location interoperability in other domains where harmonised geospatial data play a significant role.”

<sup>9</sup> <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32019L1024>

<sup>10</sup> <https://eur-lex.europa.eu/eli/reg/2016/679/oj>

<sup>11</sup> <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32014L0024&qid=1428299560152&from=EN>

<sup>12</sup> As introduced by the Communication from the European Commission of 23/3/2017: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2017%3A134%3AFIN>

<sup>13</sup> <https://joinup.ec.europa.eu/node/704194>

<sup>14</sup> <https://joinup.ec.europa.eu/node/704361>

<sup>15</sup> <https://joinup.ec.europa.eu/node/704247>

<sup>16</sup> <https://joinup.ec.europa.eu/collection/elise-european-location-interoperability-solutions-e-government/solution/eulf-blueprint/about>

The information collected through LIFO can be used to examine current national and European status, compare countries, identify strengths and areas needing improvement, uncover best practice solutions, and plan appropriate measures, including potential partnerships and reuse of solutions.

The LIFO State of Play and the emerging best practices are incorporated in updates to the EULF Blueprint, ensuring the guidance framework remains up-to-date.

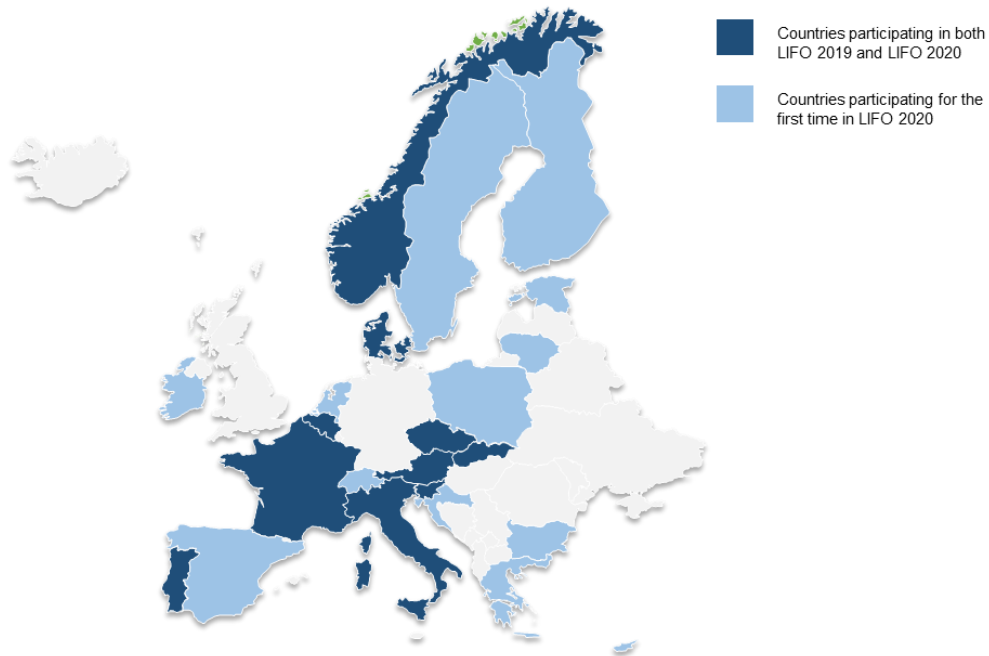


Figure 3 - LIFO participating countries in 2019 and 2020

The LIFO 2019 data collection involved 10 countries, whereas the LIFO 2020 data collection involved 23 countries. Appreciation is given to all participants who contributed to the survey responses and provided further information to ensure the results are representative of the national state of play (see [Figure 3](#))<sup>17</sup>.

<sup>17</sup> Countries participating in both LIFO 2019 and LIFO 2020: Austria, Belgium, Czech Republic, Denmark, France, Italy, Norway, Portugal, Slovakia and Slovenia; Countries participating for the first time in LIFO 2020: Bulgaria, Croatia, Cyprus, Estonia, Finland, Greece, Ireland, Lithuania, Netherlands, Poland, Spain, Sweden and Switzerland.

## 2. Structure of the document

This factsheet provides an overview of the information collected on location interoperability in Switzerland in 2020. It contains the following sections:

- [Location Interoperability State of Play](#) where information is provided at two levels:
  - **Overview of results:** describes the location interoperability state of play in the country across all five focus areas, together with a summary chart and a table with the main strengths and weaknesses;
  - **Detailed results by focus area:** organised in five sections; while the overview section gives a bird's eye view of the status across all focus areas, the focus area sections give a more detailed picture, with the vision and recommendations for the focus area, followed by an analysis of the state of play in the country for each of the recommendations. Two focus area charts are included, one displaying the average scores for each recommendation and the other the individual scores for the underlying indicators. In both charts, scores are compared with the average of the monitored countries. The titles of the charts are linked respectively to the table of recommendations in the focus area and to the relevant indicators in [Annex 2](#).
- [Best Practices:](#) This section highlights initiatives and applications provided as survey 'evidence' which demonstrate the adoption of EULF Blueprint good practices in one or more focus areas / recommendations.

Lists of [abbreviations and definitions](#), [figures](#) and [tables](#): These aid cross-referencing in the document.

Annexes to the document are:

- [Annex 1:](#) The method of scoring and normalisation applied to the indicators;
- [Annex 2:](#) A list of indicators used for each of the recommendations, together with a summary of 2020 indicator changes;
- [Annex 3:](#) Additional information for Switzerland comprising the questionnaire response and the scores and charts based on the response.

The 2020 LIFO monitoring information for Switzerland has been provided by the *Federal Statistics Office* and the *Federal Office of Topography swisstopo*.

## 3. Location Interoperability State of Play

### 3.1. Overview

The information collected through the LIFO 2020 data collection indicates that Switzerland has performed above the average of the surveyed countries in terms of location interoperability practices. This is mostly due to the strong positioning of the country in the “Return on Investment” and “Governance, Partnership and Capabilities” focus areas. Under the former, the country strongly engages in the communication of benefits of integrating and using location information in digital public services. Under the latter, stakeholders from different communities, domains, administrative levels and sectors, are consistently involved in the decision making process on the role of location information in Digital Government. These two elements have determined to a large extent the positive performance in the respective focus areas. An area for improvement under “Return on Investment” entails needing to fully exploit the range of possibilities to facilitate the search of and access to (public) location data by external parties.

The “Digital Government Integration” focus area has higher results when compared with the European average. Switzerland has progressed well in the use of the Spatial Data Infrastructure (SDI) to deliver digital public services across sectors. However, the actions taken to involve external parties in the development and delivery of location-enabled digital public services are not particularly wide-ranging and need improving.

Very positive results also come from the “Policy and Strategy Alignment” focus area, under which the adoption of the “Swiss Geo-information Strategy” sets up a framework to make geo-information reliable and available to everyone.

“Standardisation and Reuse” is the only focus area below the European average. This is partly due to the fact that a strategy to reuse existing authentic data is still in the planning phase and only a few registers of location information have already been implemented. However, the new organisation “Digital Administration Switzerland” has in its plans the promotion of reuse and standardisation on the e-government side.

As a non-Member State of the EU, a caveat for the results from Switzerland is that the country is not legally bound to align with EU legislation (e.g. the INSPIRE Directive or the GDPR). This may affect the results on some indicators that are more specifically related to alignment with EU legislation. The country has however, decided to adopt the INSPIRE Directive insofar as it is beneficial for Swiss institutions, particularly with regard to cooperation with EU Member States<sup>18</sup>.

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*The value of the overall LIFO index combining the scores for all focus areas is 0.62, which confirms the good performance of Switzerland in terms of location interoperability. This compares with a European average of 0.55.*

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<sup>18</sup> <https://www.geo.admin.ch/en/about-swiss-geoportal/task-and-responsibilities/inspire.html>



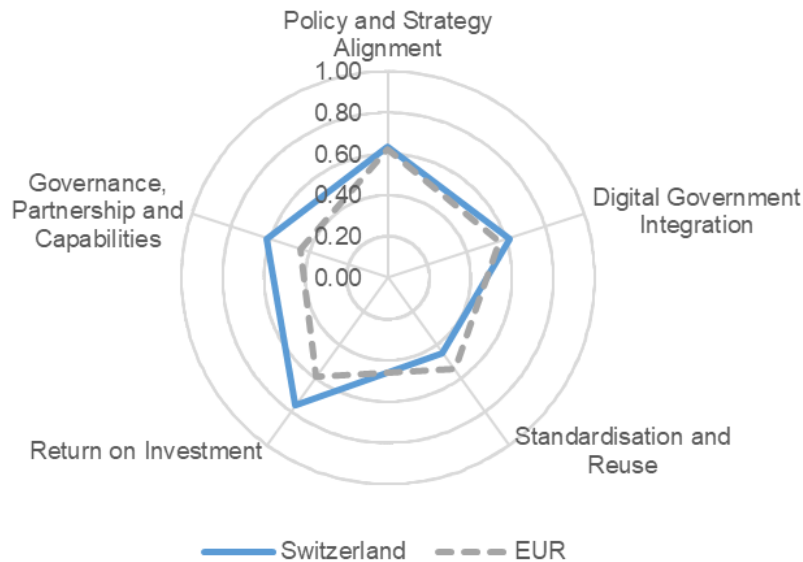







Figure 4 - Overall EULF Blueprint implementation

The following table summarises Switzerland’s main strengths and weaknesses across the five focus areas:

Focus Area	Strengths	Weaknesses
 <b>Policy and Strategy Alignment</b>	<ul style="list-style-type: none"> <li>The Swiss Geo-information Strategy explicitly aligns with and completes the Swiss Digital Strategy</li> <li>A wide range of location core reference datasets are available free of charge for general use</li> <li>Location-based evidence and analysis is used to help in developing most relevant policies and monitoring outcomes in certain relevant topics</li> </ul>	<ul style="list-style-type: none"> <li>Many location datasets are available under the same licensing conditions but not as part of a national licensing framework</li> <li>Only generic reference is made to applicable standards in public procurements of location data and services</li> </ul>
 <b>Digital Government Integration</b>	<ul style="list-style-type: none"> <li>The country is actively involved in delivering cross-sector and cross-border digital public services using its spatial data infrastructure (SDI)</li> <li>An array of actions is undertaken to ensure the integration of location data within statistics</li> </ul>	<ul style="list-style-type: none"> <li>Limited use of the public sector SDI is made by the private sector for the delivery of innovative applications, products and services</li> <li>External partners are involved in few ways in developing or delivering location-based digital public services</li> </ul>
 <b>Standardisation and Reuse</b>	<ul style="list-style-type: none"> <li>APIs are available for all high value public sector datasets including location datasets as part of a national strategy</li> </ul>	<ul style="list-style-type: none"> <li>Limited reuse is made of generic ICT solutions in the SDI</li> </ul>

Focus Area	Strengths	Weaknesses
 <p><i>Return on Investment</i></p>	<ul style="list-style-type: none"> <li>Monitoring performance of location-enabled digital public services is based on a wide variety of factors</li> <li>Regular and thorough communication is made regarding the benefits of integrating and using location information in digital public services</li> </ul>	<ul style="list-style-type: none"> <li>The country does not fully exploit the range of possible measures to facilitate searching, finding and accessing location data and web services for external parties</li> </ul>
 <p><i>Governance, Partnerships and Capabilities</i></p>	<ul style="list-style-type: none"> <li>Several formal agreements between public administrations in the country have led to the development and delivery of a large number of services</li> </ul>	<ul style="list-style-type: none"> <li>There is no strategic approach to capacity building and training for innovative geospatial solutions</li> </ul>

*Table 1 – Strengths and Weaknesses by Focus Area*

The following sections present the results in detail for each focus area.

## 3.2. Policy and Strategy Alignment


Vision	
	There is an aligned and coordinated policy and strategic approach across Europe for the use of location information that enables more efficient and effective integration of cross-sector and cross-border location-based applications, reducing costs and increasing social and economic benefit. Public sector location policies promote accessibility and interoperability. There are simple and consistent approaches to licensing, progressive open data policies that balance the needs of data users and suppliers, and authentic registers in which 'location' has a prominent role.
<a href="#">Recommendation 1</a>	Connect location information and digital government strategies in all legal and policy instruments
<a href="#">Recommendation 2</a>	Make location information policy integral to, and aligned with, wider data policy at all levels of government
<a href="#">Recommendation 3</a>	Ensure all measures are in place, consistent with legal requirements, to protect personal privacy when processing location data
<a href="#">Recommendation 4</a>	Make effective use of location-based analysis for evidence-based policy making
<a href="#">Recommendation 5</a>	Use a standards-based approach in the procurement of location data and related services in line with broader ICT standards-based procurement

Table 2 - Focus Area "Policy and Strategy Alignment" - vision and recommendations

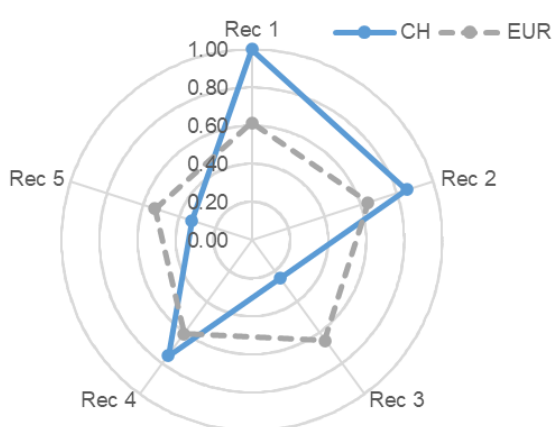


Figure 5 - Policy and Strategy Alignment – scores by recommendation

The scores for each recommendation in the “Policy and Strategy Alignment” focus area are shown in [Figure 5](#) and the underlying indicator scores for each recommendation are shown in [Figure 6](#). In both cases, the country scores are compared to the European averages.

The “Policy and Strategy Alignment” focus area index for Switzerland is 0.64, closely aligned with the European average of 0.62, although the results for individual recommendations vary quite significantly from the corresponding European averages. Switzerland is very strongly positioned in [Recommendation 1](#), [Recommendation 2](#) and [Recommendation 4](#), while

[Recommendation 3](#) and [Recommendation 5](#) display significant gaps. With regard to [Recommendation 3](#) and [Recommendation 5](#), however, it must be noted that European legal provisions such as INSPIRE and the GDPR do not apply to Switzerland, except for very specific cases.

With respect to [Recommendation 1](#), the Federal Council and the Conference of Cantonal Directors of Public Works, Planning and the Environment adopted the "Swiss Geo-information Strategy"<sup>19</sup> on 11 December 2020. The Strategy aims at making reliable and updated geo-information available to everyone, through actions such as the creation of a geospatial ecosystem, the availability of interconnected and trustworthy location data and the facilitation of location-enabled business processes. The Swiss Geo-information Strategy explicitly aligns

<sup>19</sup> <https://cms.geo.admin.ch/info/Strategie-Geoinformation-Schweiz-f.pdf>

with and completes the Swiss Digital Strategy<sup>20</sup>. This strategic approach is complemented by the existence of general cross-sector legislation and cross-sector binding agreements to regulate the use of authoritative location datasets and services in digital government.<sup>21</sup>

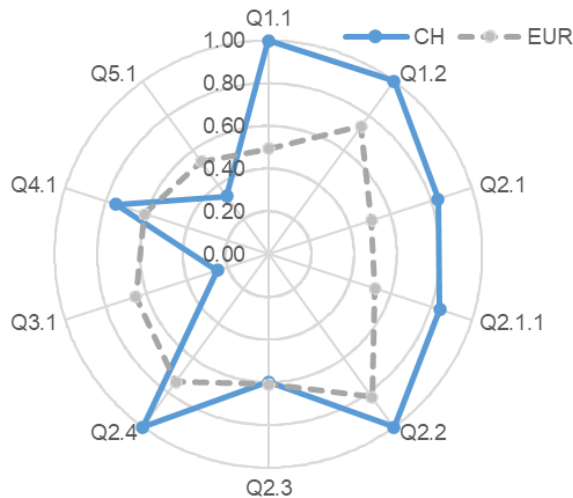


Figure 6 – Policy and Strategy Alignment – scores by indicator

Most location datasets are available free of charge under an open licence without restrictions ([Recommendation 2](#)). The datasets are available under the same licensing conditions but not as part of a national licensing framework.

The datasets available under an open licence include addresses, administrative units, cadastral parcels, elevation, geographical names, hydrography, land cover, land use, population distribution and demography, protected sites, statistical units, transport networks, transport timetables, water quality and weather observations. More than 800 geodatasets are available on the Federal Spatial Data

Infrastructure (FSDI). Open government data are available to the general public in the portal “opendata.swiss”<sup>22</sup>. This is a website that offers easy access to the public data of the Swiss Confederation, cantons, municipalities and other organisations.

The only restrictions applicable to the use of data consist in volume-based fees<sup>23</sup>. A recent revision of the ordinance on fees aims to introduce the principles of Open Government Data (OGD) for a large part of geodata. In this respect, from 1 March 2021<sup>24</sup>, the Federal Office of Topography, swisstopo, has made available its official digital data and services free of charge, under condition of “fair use” (i.e. moderate use compatible with common good<sup>25</sup>). This excludes the cases of “excessive use” (i.e. large volumes of data requested or large number of requests). In this way, swisstopo offers new opportunities for innovative companies, organisations and individuals to develop information services. Commercial use is, therefore, not subject to charges *per se* but requires authorisation by the competent authority. This opening of data is in line with the “Strategy for open access to public data in Switzerland for the years 2019 to 2023”<sup>26</sup> adopted by the Federal Council in November 2018.

Pan-government guidelines on the publication of public sector data define data modelling aspects according to a standardised description format and exchange format (INTERLIS), basic geodata models, the configuration of a generic metadata portal, and standardised procedures for importing and disseminating geo-data.

<sup>20</sup> <https://www.bakom.admin.ch/bakom/en/homepage/digital-switzerland-andinternet/strategie-digitale-schweiz.html>

<sup>21</sup> A compilation of articles of the federal constitution, acts and ordinances that regulate the duties, services and responsibilities of the Federal Office of Topography swisstopo is available at <https://www.swisstopo.admin.ch/en/swisstopo/legal-bases/applicable-legalbases.html>. Among these, stands the Federal Act on geoinformation (<https://www.fedlex.admin.ch/eli/cc/2008/388/en>). The act “has the aim of ensuring that geodata relating to the territory of the Swiss Confederation is made available for general use to the authorities of the Confederation, the cantons and communes, the private sector, the public and to academic and scientific institutions in a sustainable, up-to-date, rapid and easy manner, in the required quality and at a reasonable cost.”

<sup>22</sup> <https://opendata.swiss/en/>

<sup>23</sup> Fees available at <https://www.fedlex.admin.ch/eli/cc/2021/38/fr>

<sup>24</sup> <https://www.admin.ch/gov/fr/accueil/documentation/communiqués.msg-id-82509.html>

<sup>25</sup> <https://www.geo.admin.ch/en/geo-services/geo-services/terms-of-use.html>

<sup>26</sup> <https://www.bfs.admin.ch/bfsstatic/dam/assets/16164831/master>

As mentioned above, the indicator for [Recommendation 3](#) shows significant gaps in the preparation for the full implementation of the GDPR from a geospatial perspective. This, however, only concerns the field of application of the GDPR with regard to the treatment of personal location data of subjects established in the EU. The reference law for the Swiss public sector is not the GDPR but the Federal Data Protection Law (FDPL). Swiss public bodies are compliant with FDPL and well prepared to deal with location data privacy issues. The FDPL is currently under a review process that aims at implementing many of the additional requirements of the GDPR into Swiss law, thus leading to stronger alignment between the two data protection legislations.

Location-based evidence and analysis is used to help develop policies and monitoring outcomes in many relevant topics ([Recommendation 4](#)). The action plan of the Digital Switzerland strategy contains more than one hundred actions referring to or making use of geo-information.<sup>27</sup>

As for [Recommendation 5](#), it must be noted that since Switzerland is not a member of the European Union, the INSPIRE Directive is a generic reference document only, therefore INSPIRE is not the main geospatial standard applicable in the country. On the contrary, one of the main reference standards is INTERLIS, based on which most of the datasets are very precisely modelled. For each specific purchase involving location data and services, the data model of a dataset must be described with the INTERLIS standard.

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<sup>27</sup> [Digital Switzerland Strategy - Action plan \(digitaldialog.swiss\)](#)

### 3.3. Digital Government Integration


Vision	
	Location is well integrated in digital government processing supporting G2G, G2B and G2C interactions, through location related services across government. Users do not have to supply the same mandatory information multiple times. There is visibility of common coordinating and support structures, expert groups and technologies, a strong user voice in the design, evaluation and improvement of location-based services, and good evidence of take-up of services.
<a href="#">Recommendation 6</a>	Identify where digital government services and processes can be modernised and simplified through the application of location-enabled services and implement improvement actions that create value for users
<a href="#">Recommendation 7</a>	Use spatial data infrastructures (SDIs) in digital public services and data ecosystems across sectors, levels of government and borders, integrated with broader public data infrastructures and external data sources
<a href="#">Recommendation 8</a>	Adopt an open and collaborative methodology to design and improve location-enabled digital public services
<a href="#">Recommendation 9</a>	Adopt an integrated location-based approach in the collection and analysis of statistics on different topics and at different levels of government

Table 3 - Focus Area "Digital Government Integration" - vision and recommendations

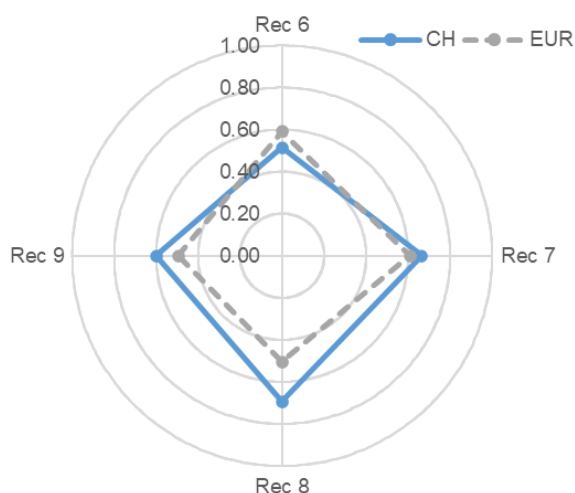


Figure 7 - Digital Government Integration – scores by recommendation

The scores for each recommendation in the “Digital Government Integration” focus area are shown in [Figure 7](#) and the underlying indicator scores for each recommendation are shown in [Figure 8](#). In both cases, the country scores are compared with the European averages.

The “Digital Government Integration” focus area index for Switzerland is 0.62 above the to the European average of 0.57. The results show a solid performance throughout the four recommendations and is a point of strength for the country. This is due to its extensive use of the SDI in delivering cross-sector and cross-border digital public services, as well as for the integration of location data with statistical data.

Switzerland scored better than the European average under all recommendations with the only exception of [Recommendation 6](#). In particular, [Recommendation 8](#) and [Recommendation 9](#) are those where Switzerland has the strongest advantage over the European average.

Switzerland has implemented several actions for the integration of location and statistical information in the production of location-based statistics<sup>28</sup> ([Recommendation 9](#)) namely:

- an accurate and up-to-date knowledge base is maintained of where citizens and businesses are located;
- a common geospatial reference framework for statistics enables timely, accurate and efficient production of location-based statistics;
- the collection of census data is based on the location reference framework for statistics;

<sup>28</sup> The framework used for the geocoding of statistics is described in the following document: [https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.58/2017/mtg3/Paper\\_UNECE\\_v1\\_1\\_1.pdf](https://www.unece.org/fileadmin/DAM/stats/documents/ece/ces/ge.58/2017/mtg3/Paper_UNECE_v1_1_1.pdf)

- location-based statistics are updated dynamically to give an up-to-date snapshot for decision making;
- the spatio-temporal dimension of statistics is captured in a format that enables it to be used readily in a tool for geo-statistical analysis;
- the location intelligence infrastructure is continuously upgraded to meet growing and evolving needs based on a regular quality assessment of whether the infrastructure is fit for purpose.

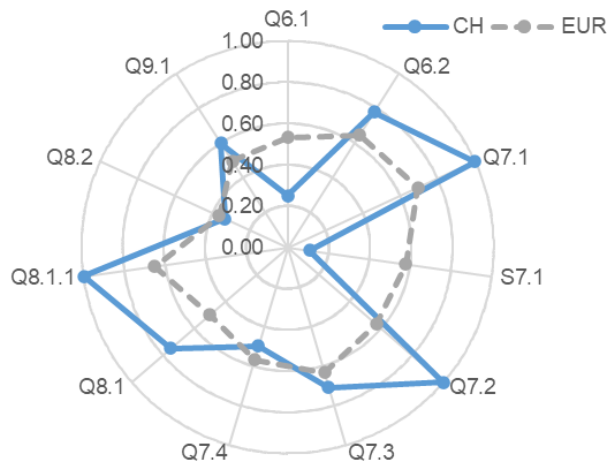


Figure 8 – Digital Government Integration – scores by indicator

The Spatial Data Infrastructure (SDI) is extensively used to deliver digital public services across sectors and levels of government ([Recommendation 7](#)). Similarly, Switzerland is also involved in delivering many cross-border digital public services using the SDI. Digital public services rely, in a limited way, on INSPIRE-conformant datasets and services. An example of a digital public service reusing data from the SDI is offered by the Federal Office of Meteorology that updates its weather information from weather station data every ten minutes. In order to publish this information, the Office uses the SDI map window on its website<sup>29</sup>. Another example is the interactive application “Je recharge mon auto”<sup>30</sup>, through which the charging station operators, SuisseEnergie, the Swiss Federal Office of Energy (SFOE) and the Federal Office of Topography (swisstopo) offer an overview of the charging infrastructure for electric vehicles in Switzerland. The application shows in real time, which charging stations are available, thereby promoting the development of energy-efficient and climate-friendly electric mobility. An example of a cross-border digital service is the harmonised INSPIRE data exchange for the Lake Constance region involving cooperation between Austria, Switzerland the German federal states of Bayern and Baden-Württemberg<sup>31</sup>. In addition, there are several more cross border services such as the Swiss SDI in Geneva (France/Switzerland) or Basel (France/Switzerland/Germany), but in these cases the INSPIRE directive is not used as a standard for data exchange.

Most sectors prefer a hybrid SDI approach which merges the use of sector SDI (e.g. the public thematic geoportals<sup>32</sup>) with the national SDI. An exception is the disaster management and civil protection sector that only uses application-specific spatial data. The public sector SDI is also extensively used by the private sector and other organisations to deliver innovative applications, products and services. A number of good examples are: Schweiz Mobil<sup>33</sup> for hiking paths, Swiss Parks Network<sup>34</sup>, “gipfelbuch.ch” for planning hiking trips<sup>35</sup>, the Rega Emergency App for the Swiss Air-Rescue organisation<sup>36</sup>, eOperations Switzerland that

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<sup>29</sup> <https://www.meteoswiss.admin.ch/home/measurement-values.html?param=messwerte-lufttemperatur-10min&station=MER&chart=hour>

<sup>30</sup> <https://www.je-recharge-mon-auto.ch>

<sup>31</sup> <https://www.bodensee-geodatenpool.net/>

<sup>32</sup> <https://www.geo.admin.ch/fr/geoportails-thematiques/liste-des-geoportails-thematiques.html>

<sup>33</sup> <https://www.schweizmobil.ch/de/sommer.html>

<sup>34</sup> <https://www.parks.swiss/en/>

<sup>35</sup> <https://www.gipfelbuch.ch/gipfelbuch/karte>

<sup>36</sup> <https://www.rega.ch/en/news/news-from-the-world-of-rega/detail/die-neue-rega-app>

enables common digital public services for the Confederation, cantons and communes<sup>37</sup> and e-Umzug, the online moving notification to public authorities<sup>38</sup>.

Switzerland has adopted an open and collaborative methodology to design and improve location-enabled digital public services at all three possible levels (local, sub-national and national) ([Recommendation 8](#)). Collaboration is strong between public authorities, while the private sector, NGOs and citizens are involved only to a limited extent in the process of developing/delivering location based digital public services. This happens mostly in terms of reuse of private sector / citizens data, or viceversa in terms of data made openly available for external parties to develop their own products and services. For instance:

- several portals (Confederation, cantons and municipalities) use the services of Google or Open Street Map (OSM);
- the planned Aeronautical Data Collection Service foresees the development of a digital platform for aeronautical data; all aviation stakeholders – from air navigation services, to aerodrome operators to owners of air navigation obstacles – will in future submit aeronautical data through a data recording internet service<sup>39</sup>;
- the Swiss U-Space Implementation<sup>40</sup> is based on a private-public partnership of the Federal Office of Civil Aviation (FOCA) with skyguide, the Swiss air navigation service provider, to develop, test and implement U-Space technologies and services. Various Swiss and international companies have now signed the cooperation agreement to formalise their partnership, which is now referred to by the acronym SUSI<sup>41</sup>.

Finally under [Recommendation 6](#), location information is used in comprehensive or even innovative ways in several sectors, even if this is done as the result of ad-hoc actions rather than of an established improvement process. Significant examples include:

- disaster management and civil protection: Rapid Mapping<sup>42</sup> is a federal government service that collects and makes available geo-data such as aerial or satellite imagery following natural disasters, in order to manage and document these events. The relevant authorities are actively supported in assessing and documenting the impacts of natural events;
- energy: developed in collaboration with “Meteotest”, the application “Toit Solaire”<sup>43</sup> combines the data provided by “swisstopo” on the size and orientation of each roof surface with satellite data on solar radiation provided by “MeteoSwiss”. The map shows the degree of suitability of roofs for the use of solar energy, together with the potential yield. For this purpose the course of the sun throughout the year is simulated and the level of solar radiation reaching the roof is calculated;
- property and land administration: the Cadastre of Public-law Restrictions on Landownership (PLR-cadastre)<sup>44</sup> is the official information system on the most important public-law restrictions on landownership in Switzerland. These public law restrictions on landownership (PLRs) are legally binding for landowners. The Cadastre of Public Law Restrictions on Landownership (PLR Cadastre) makes information about PLRs easily accessible to everyone. It also ensures a high degree of legal certainty thanks to the provision of binding information. It is not only land owners, but also the various players on

<sup>37</sup> <https://www.eoperations.ch/>

<sup>38</sup> <https://www.eumzug.swiss/eumzug/#/global>

<sup>39</sup> <https://www.admin.ch/gov/de/start/dokumentation/medienmitteilungen.msg-id-75398.html>

<sup>40</sup> “U-space” refers a collection of digitalised and automated functions and processes aimed at providing safe, efficient and fair access to airspace for the growing number of civilian drone operations. See <https://www.bazl.admin.ch/bazl/en/home/good-to-know/drones-and-aircraft-models/u-space.html>

<sup>41</sup> <https://susi.swiss/>

<sup>42</sup> [Rapid Mapping \(admin.ch\)](#)

<sup>43</sup> [Wie viel Strom oder Wärme kann mein Dach produzieren? \(admin.ch\)](#)

<sup>44</sup> [Cadastre RDPPF Suisse | cadastre.ch](#)



the property market, as well as authorities and public administrations, who benefit from this comprehensive instrument;

- transport<sup>45</sup>: The Confederation intends to facilitate the combination of the different modes of transport. In order to be able to develop some location-enabled apps, companies need information from the various service and mobility providers. To simplify the exchange, the creation of a national infrastructure of mobility data (NaDIM) is planned as a public service offered by the Confederation. An offer that combines different means of transport will facilitate access to public transport among other things, making it more attractive to new customers;
- regional and urban development: The Swiss Geological Survey provides access to geological data and 3D models of the underground<sup>46</sup>. It coordinates geological activities in Switzerland and provides advice on geo-energy projects and subsurface construction projects. Gaining geological knowledge facilitates the sustainable use of the underground and also simplifies planning and approval procedures. By compiling comprehensive, uniform, homogeneous and up-to-date geological data, maps and models, it also makes a valuable contribution towards the provision of information to a society in transition.
- environment: The Swiss Federal Office for the Environment (FOEN) defines various monitoring programmes for the environment, maintains measurement networks and provides information as a basis for decisions e.g. related to environmental policies based on environmental and location data<sup>47</sup>.

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<sup>45</sup> [Federal Office of Transport FOT Multimodal Mobility \(admin.ch\)](#)

<sup>46</sup> [Geological services \(admin.ch\)](#)

<sup>47</sup> <https://www.bafu.admin.ch/bafu/en/home/state/data/environmental-data.html>

### 3.4. Standardisation and Reuse


Vision	
	Core data has been defined and a funding model has been agreed for its ongoing maintenance and availability. Consistent use of geospatial and location-based standards and technologies, enabling interoperability and reuse, and integration with broader ICT standards and technologies, including the standards and solutions promoted by the ISA2 programme. Use of these standards in all areas related to the publication and use of location information in digital public services, including metadata, discovery, view, exchange, visualisation etc.
<a href="#">Recommendation 10</a>	Adopt a common architecture to develop digital government solutions, facilitating the integration of geospatial requirements
<a href="#">Recommendation 11</a>	Reuse existing authentic data, data services and relevant technical solutions where possible
<a href="#">Recommendation 12</a>	Apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in digital public services
<a href="#">Recommendation 13</a>	Manage location data quality by linking it to policy and organisational objectives, assigning accountability to business and operational users and applying a “fit for purpose” approach

Table 4 - Focus Area “Standardisation and Reuse” - vision and recommendations

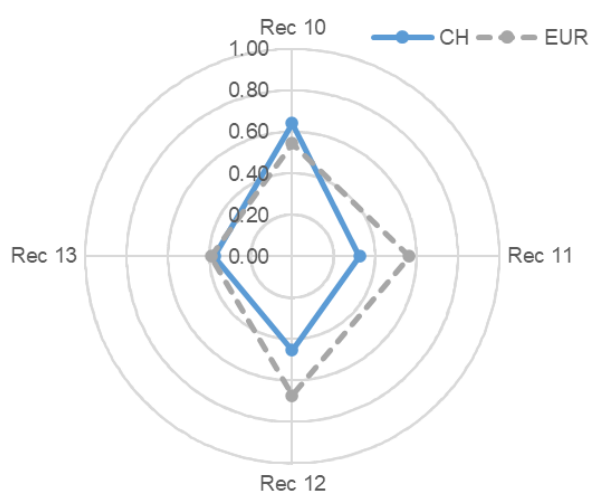


Figure 9 - Standardisation and Reuse – scores by recommendation

The scores for each recommendation in the “Standardisation and Reuse” focus area are shown in [Figure 9](#) and the underlying indicator scores for each recommendation are shown in [Figure 10](#). In both cases, the country scores are compared to the European averages.

The “Standardisation and Reuse” focus area index for Switzerland is 0.45, compared to an European average of 0.55. This is the only area where Switzerland is positioned below the European average.

Switzerland’s main strength for this focus area is represented by the access to a wide range of location datasets through APIs ([Recommendation 10](#)), while it shows areas

for improvement due to the limited reuse of generic solutions in the SDI and in the still relatively small set of registers for geospatial information ([Recommendation 11](#)).

The index for [Recommendation 10](#) is above the European average. This is mostly due to the fact that APIs are available for all high value public sector datasets, including location datasets, as part of a national strategy. More than eight hundred sets of geodata are available on the Federal Spatial Data Infrastructure through the GeoAdmin’s API<sup>48</sup>. The following steps are taken to stimulate take-up of the APIs and ensure they are as useful as possible:

- APIs are based on recognised standards (e.g. OGC API - Features, OGC SensorThings API);
- APIs are documented in open specifications (e.g. through OpenAPI specifications);

<sup>48</sup> <http://api.geo.admin.ch/>

- API design best practices are used (e.g. REST APIs);
- APIs provide access to updates of both static (slow moving) and dynamic (fast moving) data;
- APIs are discoverable in both public sector catalogues/portals and external catalogues (alongside non-public sector APIs).

The policy for a common location architecture is not yet widely adopted in Switzerland. Furthermore, only ad-hoc procedures are in place to discover, explore and incorporate new technological features or emerging technologies with little testing done.

Switzerland has planned and studied the possibility for re-using generic solutions in the SDI, however, has not made concrete steps in that direction ([Recommendation 11](#)).

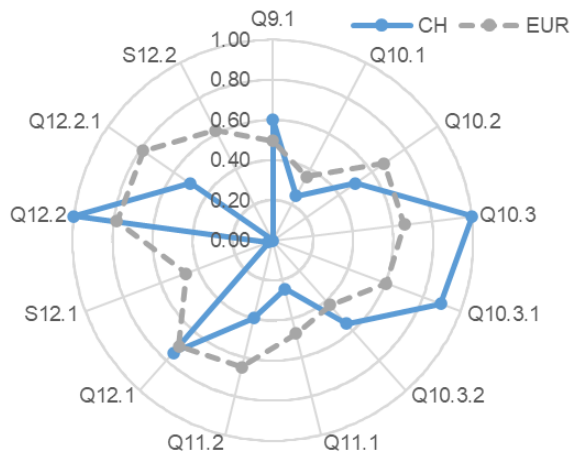


Figure 10 – Standardisation and Reuse – scores by indicator

In terms of data reuse, Switzerland’s public administrations have implemented only four registers of location information:

- addresses<sup>49</sup>;
- administrative units<sup>50</sup>;
- cadastral parcels<sup>51</sup>;
- buildings<sup>52</sup>.

This must be read in light of the fact that a strategy to foster the reuse of authentic data is still in the study and planning phase in Switzerland. A preliminary design has been developed, with the adoption of legal bases expected to begin in 2022. If these new legal bases can be implemented as soon as 2024, the first geo-registries could be available in

2025. The new organisation “Digital Administration Switzerland” has in its plans the promotion of the reuse of authentic data.

Switzerland uses different types of geospatial standards in order to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in digital public services. These types include international standards, adaptations of international standards (e.g. INSPIRE) and stand-alone domestic standards. Examples of standards used are:

- INTERLIS: offers the possibility to describe spatial data very precisely, to integrate it in accordance with the model and to exchange it easily between different users<sup>53</sup>. INTERLIS has been legally anchored in geo-information legislation since 2008 and has been standardised at a national level<sup>54</sup>; All data models under federal law are described and exchanged using INTERLIS. There is a model repository on which all data models are available, and accessible for machine2machine communication;
- OGC standards are also widely used for the dissemination of geo-data.

<sup>49</sup> [Official directory of building addresses \(admin.ch\)](#)

<sup>50</sup> [Swiss official commune register | Federal Statistical Office \(admin.ch\)](#)

<sup>51</sup> [Mensuration officielle | cadastre.ch](#)

<sup>52</sup> [Federal Register of Buildings and Dwellings | Federal Statistical Office \(admin.ch\)](#)

<sup>53</sup> <https://www.interlis.ch/en>

<sup>54</sup> <https://www.ech.ch/fr/standards/38926>

Moreover, there is a standardised metadata approach to facilitate discoverability of spatial and non-spatial data through joint access mechanisms<sup>55</sup>.

The association eCH promotes, develops and adopts standards in the field of e-government. National standards, including those in the geospatial domain, are referred to in the eCH e-government standards website<sup>56</sup>.

Lastly, with the aim of assuring quality of location data, several actions have been implemented both at design and measurement levels ([Recommendation 13](#)). At the design level, location data quality is ensured by:

- development and application of a framework for analysis of data quality;
- inclusion of different dimensions of data quality in the standard (e.g. timeliness, accuracy, completeness, integrity, consistency, compliance to specifications / standards / legislation);
- inclusion of multilingualism in the data quality standard and the definition of national guidelines on data quality based on ISO Standard 25012 (ISO 25012, ISO 19157 and INTERLIS are the data quality standards applied to location data).

Concerning location data quality governance ([Recommendation 12](#)), the actions implemented involve: the alignment of the data quality improvement roadmap with the information governance vision and strategy; well-defined data quality responsibilities; the existence of a cross-organisation special interest group for data quality; the collection of feedback from users to report problems and help improve data quality. Regarding the last point, feedback is collected through a mechanism which is embedded in the SDI data portals or catalogues of services.

The low values of the indicators on the compliance of spatial datasets and network services with relevant INSPIRE provisions can be explained by the non-binding nature of INSPIRE for Switzerland.

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<sup>55</sup> Catalogue Service CSW 2.0.2: <https://www.geocat.admin.ch/en/dokumentation/csw.html>

The metadata model GM03 is a Swiss standard SNV 612050. GM03 is a profile of the international metadata standard ISO 19115. Several upgrades were carried out to meet the various specifications by swisstopo's Swiss partners. <https://www.geocat.admin.ch/en/dokumentation/gm03.html>

<sup>56</sup> <https://www.ech.ch/de>

### 3.5. Return on Investment

Vision	
	There is a strategic approach to national and European funding, procurement, and delivery of location information and location-based services to minimise costs and maximise benefits for government, businesses and citizens, recognising best practices, and building on INSPIRE and standardisation tools. The funding and sourcing model for collection and distribution of core location data takes into account user needs from different sectors and the strategic importance of continued supply of data at a suitable quality. Procurement recognises INSPIRE and other standardisation tools in a meaningful way. There are compelling impact assessments and business cases, a rigorous approach to targeting and tracking benefits, and good evidence that benefits are being achieved.
<a href="#">Recommendation 14</a>	Apply a consistent and systematic approach to monitoring the performance of location-based services
<a href="#">Recommendation 15</a>	Communicate the benefits of integrating and using location information in digital public services
<a href="#">Recommendation 16</a>	Facilitate the use of public administrations' location data by non-governmental actors to stimulate innovation in products and services and enable job creation and growth

Table 5 - Focus Area "Return on Investment" - vision and recommendations

The scores for each recommendation in the "Return on Investment" focus area are shown in [Figure 11](#) and the underlying indicator scores for each recommendation are shown in [Figure 12](#). In both cases, the country scores are compared to the European averages.

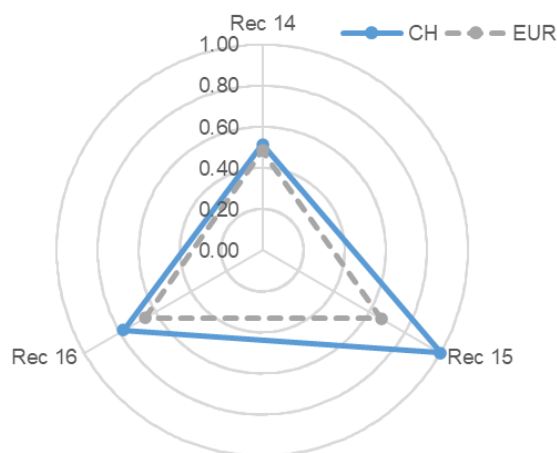


Figure 11 - Return on Investment – scores by recommendation

The "Return on Investment" index is 0.76, the highest among all five focus areas, compared to the European average of 0.58. Switzerland has shown very positive results in 2020 for [Recommendation 15](#) while [Recommendation 14](#) and [Recommendation 16](#) are slightly above the European average.

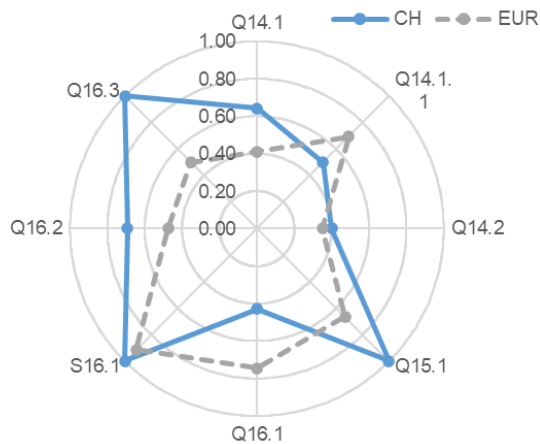
Switzerland delivers regular, thorough and convincing communication regarding the benefits of integrating and using location information in digital public services ([Recommendation 15](#)). The Swiss Confederation's geoportal has received various awards in recognition of its excellent services since 2010, such as the "Swiss Public Excellence Award" (2010) and the "United Nations Public Service Award"

(2012). Switzerland is utilising predominantly social networks such as Twitter to announce the latest developments in terms of geospatial news and publish the pertinent links to articles and video for deeper reading.

The measurement of the efficiency and effectiveness of location-based services at organisational level is based on a considerable number of elements ([Recommendation 14](#)):

- return on investment;
- reusability;
- adaptability;
- availability;

- responsiveness;
- reduction in administrative burden;
- increased participation;
- user satisfaction;
- user centricity.



*Figure 12 – Return on Investment – scores by indicator*

swisstopo has conducted a study in different years (2002, 2008 and 2016) to analyse the swiss geoinformation market and the economic impact of geoinformation<sup>57</sup>. Based on information collected through surveys, the study analyses the benefits obtained through the use of geoinformation in terms of:

- intended use (e.g. risk analysis, research, process optimisation) aggregated and by sector;
- strength (from no to very high) and size (estimated in degrees of value) of the impact on business.

The study points out that, although it is impossible to estimate the size of the benefits

obtained through the use of geoinformation, it can be concluded that its impact on the Swiss economy is significant.

Impact-based improvement in location-enabled processes and services is based on two kinds of actions:

- the identification and monitoring of the benefits of location information;
- use of the monitoring information to fund improvements in particular location data or services and to prioritise investment across the governmental portfolio.

To stimulate innovation in products and services as well as enable job creation and growth, Switzerland has implemented some measures to make the process of searching, finding and accessing location data and web services as easy as possible for companies, research institutions, citizens and other interested parties ([Recommendation 16](#)). These measures include:

- a national open data portal merging location data and non-location data<sup>58</sup>;
- a national discovery geoportal integrating INSPIRE and non-INSPIRE data<sup>59</sup>;
- thematic portals complementing general search facilities with “specialist” search.

Supporting private, non-profit and academic actors in the development of new products, services or research using public sector location data, is carried out with the following implemented actions:

- an open data policy;
- promoting access to open data through hackathons;
- testbeds for trial use of public sector data;
- 'innovation labs' or 'Innovation hubs';

<sup>57</sup> The 2016 edition of the study is available at <https://bit.ly/3bSxrQy>

<sup>58</sup> <https://opendata.swiss/en/>

<sup>59</sup> <https://www.geocat.ch/geonetwork/srv/eng/catalog.search#/home>

- government sponsorship of 'innovation' pilot projects, potentially with grants / funding<sup>60</sup>;
- adding data and services from non-governmental actors to the public sector (spatial) data infrastructure;
- collecting requirements of businesses, research institutions and other (potential) users for consideration in further development of INSPIRE/SDI;
- training in necessary skills to exploit the SDI;
- making public sector experts available to advise on / participate in the external use of data in the SDI.

Finally, there is a strategic approach to funding public sector location reference data to make access at point of use cost effective. As mentioned under [3.2](#), the Swiss Parliament approved on 17 December 2020 an ordinance making swisstopo's standard digital products available online, free of charge, from 1 March 2021.

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<sup>60</sup> . Since October 2019, a yearly budget of 3 Mio CHF is invested in a sustainable development of the national SDI. This includes funding for innovative projects committed to realizing new products, services or research in the field of location data and SDI.

### 3.6. Governance, Partnerships and Capabilities


Vision	
	<p>There is high level support for a strategic approach to the funding and availability of location information at Member State and EU level, based on INSPIRE and other tools to achieve interoperability. Effective governance, partnerships, work programmes, responsibilities and capabilities to progress such an approach have been established, taking into account the needs and expectations of stakeholders at Member State and EU level. Governments recognise the importance of 'location' understanding and skills and invest in awareness raising, training and resourcing. Service design takes account of user capabilities. Specialists form communities to share knowledge and develop new ideas related to location information. As a result, there is a sufficient level of understanding and skills to develop, deploy and use effective location-based services.</p>
<a href="#">Recommendation 17</a>	Introduce an integrated governance of location information processes at all levels of government, bringing together different governmental and non-governmental actors around a common goal
<a href="#">Recommendation 18</a>	Partner effectively to ensure the successful development and exploitation of Spatial Data Infrastructures
<a href="#">Recommendation 19</a>	Invest in communications and skills programmes to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in digital public services and support growth opportunities

Table 6 - Focus Area “Governance, Partnerships and Capabilities” - vision and recommendations

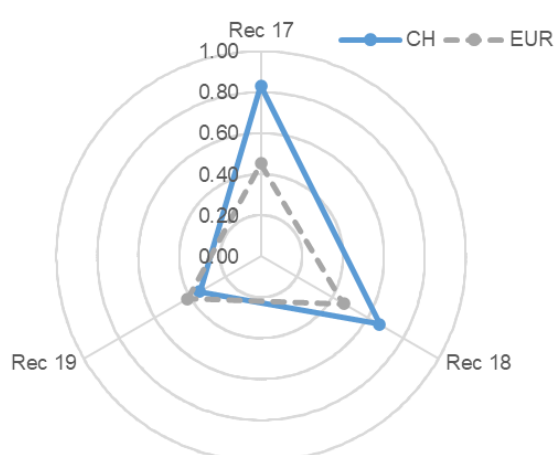


Figure 13 - Governance, Partnerships and Capabilities - scores by recommendation

The scores for each recommendation in the “Governance, Partnerships and Capabilities” focus area are shown in [Figure 13](#) and the underlying indicator scores for each recommendation are shown in [Figure 14](#). In both cases, the country scores are compared with the European averages.

The “Governance, Partnerships and Capabilities” focus area index for Switzerland is 0.62, well above the European average of 0.45. As mentioned in the [Overview](#), the country is generally well positioned in this focus area, especially under [Recommendation 17](#) on the governance of the SDI and [Recommendation 18](#) on the existence of effective partnerships for the

development and delivery of location-enabled digital public services. [Recommendation 19](#) is positioned slightly below the European average mainly because the strategic approach to improve the awareness on geospatial skills is managed only at an organisation level and there is no collective action in this regard.

One of the reasons why Switzerland performs well in this focus area, is that stakeholders from different communities, domains, administrative levels and sectors, are involved in decision making process on the role of location information in Digital Government. This reflects the federal nature of the Swiss state. The e-geo.ch programme<sup>61</sup>, was jointly launched in 2003 by the Confederation, cantons and other public and private stakeholders in the field of geo-information, with the purpose of creating a national geo-data infrastructure exploiting the

<sup>61</sup> <https://www.geo.admin.ch/en/about-swiss-geoportal/task-and-responsibilities/programm-e-geo-ch.html>

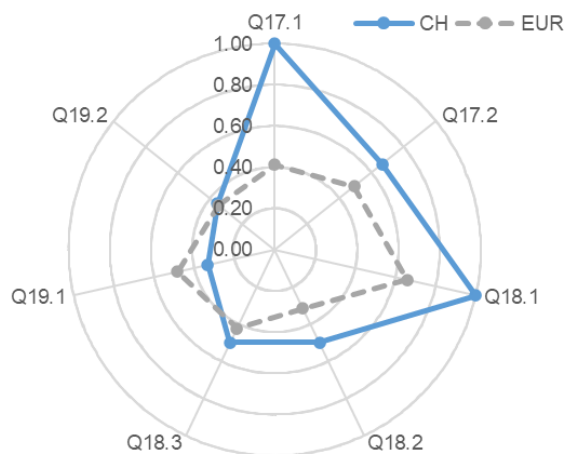


integrated joint leadership and coordination on actions and policies related to the role of the SDI in Digital Government.

The programme has identified the following areas of intervention:

- defining or adjusting the legal basis;
- defining the required metadata and making sure it is updated;
- defining the basic geo-information and services to be maintained and updated by the administration;
- promoting training, further training and research;
- political support at the highest level;
- establishing and enforcing binding standards for metadata, modelling and data exchange;
- data harmonisation;
- designing and developing the required technical infrastructure;
- developing and introducing a common strategy for pricing and distribution

While the first three listed points above have largely been implemented, the following three are



long-term networking tasks that are carried out by the Swiss Organisation for Geographic Information (SOGI)<sup>62</sup>, while the final three points relate directly to public administrations, in particular the Confederation and the cantons, and should continue to be handled bilaterally by these organs. On this basis, and to avoid redundancies in the field of geo-information, the e-geo.ch taskforce 2016 decided to reorganise or delegate the remaining e-geo.ch tasks and to suspend the “e-geo.ch” label, under which the SDI project was managed, and which may be reactivated if needed later.

*Figure 14 – Governance, Partnership and Capabilities – scores by indicator*

According to the organisational model responsible for leading and coordinating the implementation of location information / SDI and digital government, the federal administration and semi-public organisations supply geodata and geoservices in a variety of ways and with the aid of different infrastructures. In order to ensure that all interest groups are able to access these data and services quickly and efficiently, a common strategy and effective coordination are essential. At the operational level, this task is performed by the Coordination, Geo-Information and Services division (COGIS) of swisstopo on behalf of the Coordinating Agency for Federal Geographic Information (GCG).

Under [Recommendation 18](#), a point of strength concerns the existence of formal agreements between public administrations in the country that have led to the development and delivery of a large number of services<sup>63</sup>. Collaboration between the federal government and the cantons<sup>64</sup> is intended to make existing geodata more consistent, more efficient and thus to increase their added value. In order to ensure sustainable funding for the SDI, the parliament gave approval in December 2018 for the reallocation of 3 million CHF to swisstopo's annual budget, starting in 2019 and with no end date.

<sup>62</sup> <https://www.sogi.ch/en>

<sup>63</sup> See for example those mentioned under [Recommendation 8](#) above.

<sup>64</sup> [Moyens dédiés à l'INDG \(admin.ch\)](#)

Regarding partnerships with public administrations of other countries, only limited formal agreements are in place to finance, build and operate a large number of location data services or digital public services using location data. Limited agreements are also in place with private partners for a number of services or applications.

Training and awareness raising on geospatial skills is undertaken by some organisations even if not as part of a recognised geospatial competency framework ([Recommendation 19](#)). A certain number of initiatives are organised to raise awareness and develop geospatial skills, i.e.:

- training for specialists, e.g. developers, data analysts;
- special interest group for knowledge sharing within the geospatial community;
- public or cross-government events specialising in location information / GI topics
- online self-learning tools;
- provision of educational material for teachers of students between the ages of 7 and 19<sup>65</sup>.

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<sup>65</sup> [Services for schools \(admin.ch\)](#)

## 4. Best Practices

### Best Practice CH1 Cross-authority master data management system

**Policy domain:** ICT, location interoperability

**Process owner:** Federal Council, Federal Statistical Office (FSO)

**Short description:** Switzerland has set a Strategy for the expansion of the federal joint master data management system. According to the strategy, master data that is used multiple times should be jointly managed and made available for use by administrations at all federal levels and other authorised circles. As part of the implementation of the strategy, an overview of the legal, organisational and technical measures required to enable cantonal and communal administrations to access federal master data will be prepared. In addition, an identification and documentation system is to be prepared that shows in which core registers or national services the master data and associated unique identifiers are kept. A proposal for a governance model for the national data infrastructure will also be produced.

The expansion of the Federal Government's joint master data administration is a project with a long-term time horizon. Implementation will be tackled step by step. This pragmatic and step-by-step approach does justice to the complexity of the project and creates a secure basis for decision-making for further expansion steps. The first step is to initialise the expansion of the joint master data management. To this end, the measures listed above will achieve results in the years 2019-2021, and will serve as a foundation for the planning and regulated implementation of further expansion steps. Based on this foundation, a corresponding application for the next expansion step of the joint master data management for the years 2022-2024 is to be submitted to the Federal Council by the end of 2021.

**Recommendations:** [Policy and Strategy Alignment](#) (1) [Digital Government Integration](#) (8), [Standardisation and Reuse](#) (11)

**Link:** [Digital Switzerland Strategy - Action plan \(digitaldialog.swiss\); https://www.news.admin.ch/news/message/attachments/55211.pdf](#)

### Best Practice CH2 Multimodal Mobility – LinkingAlps

**Policy domain:** Multimodal mobility

**Process owner:** Federal Council, Federal Office of Transport

**Short description:** The Swiss Confederation wants to make it easier for people to combine different means of transport. In order for businesses to develop services such as mobile apps, they require access to data from various mobility and service providers. To make this exchange of information easier, the Confederation intends to offer a new public service in the shape of a national data infrastructure on mobility. Multimodal services will facilitate access to public transport, making it more attractive to new customers.

The most important requirement for improving multimodal mobility is making access to data easy and secure. This is essential if app developers and website operators are to provide consumers with integrated services, and mobility providers are to visualise their services and enable consumers to book them. Basic data on transport networks, means of transport and sales systems is not yet accessible in many areas. Active cooperation between app developers, mobility services providers and other data holders is rare and involves a lot of effort and expense for those involved.

The Swiss Federal Office of Transport is one of 14 partners from 6 countries (Austria, France, Germany, Italy, Slovenia and Switzerland) in the Interreg-funded LinkingAlps project. The main objective of the project is to foster the shift from motorised individual transport towards low carbon mobility options including public transport (e.g. rail and bus) and alternative modes such as on-demand transport.

By using innovative tools and transnationally aligned strategies to link travel information providers, the options for low carbon mobility will be increased, by offering seamless mobility chains for passengers. Travel information services across borders, operators and modes of transport will be shared among project partners to offer the best option for the end user. The approach includes pilot activities and tests for a decentralised, transnational journey planning system.

The project started on 1 October 2019 and will run until 30 June 2022. An analysis of the existing journey planners has been performed to understand user needs. Use cases for the proposed system have been defined and organisational and technical architectures have been designed for the pilot that is currently running.

**Recommendations:** [Policy and Strategy Alignment \(4\)](#); [Digital Government Integration \(6, 7, 8\)](#); [Governance, Partnerships and Capabilities \(18\)](#)

**Link:** <https://www.bav.admin.ch/bav/en/home/general-topics/mmm.html>;  
<https://www.alpine-space.org/projects/linkingalps/en/home>

### Best Practice CH3 Access to location datasets via APIs

**Policy domain:** Geodata

**Process owner:** Federal Council, swisstopo

**Short description:** The data.geo.admin.ch Spatial Temporal Asset Catalog - API is a data record-based download service that implements the STAC API specification (version 0.9) and is based on the data model of the STAC specification (version 0.9).

The STAC-API is a superset of the OGC API - Features - Part 1: Core (OAFeat) and should therefore be consumable with every OAFeat client.

The STAC-API enables querying and downloading information from the Federal Spatial Data Infrastructure (FSDI) with relevant timestamps. This can be done for whole datasets or single data items. The list of downloadable datasets (defined as “collections” in the context of the STAC-API service) is available at <https://data.geo.admin.ch/api/stac/v0.9/collections>.

**Recommendations:** [Standardisation and Reuse \(10\)](#)

**Link:** [STAC API](#)

### Best Practice CH4 Swiss Positioning Service swipos

**Policy domain:** Geolocalisation, geospatial technologies

**Process owner:** Federal Council, swisstopo

**Short description:** The Swiss Positioning Service swipos (available since 2001) provides the official spatial reference frame of Switzerland, based on the satellite systems GPS,

GLONASS, Galileo and Beidou. swipos is based on the automatic Global Navigation Satellite System (GNSS) network for Switzerland ([AGNES](#)), a network of continuously operating reference stations (CORS), covering all of Switzerland and permanently receiving signals from the available navigation satellites. swipos enables differential GNSS measurements of highest accuracy without the need to run private CORS.

The calculations use the four global navigation satellite systems (GNSS) GPS, GLONASS, Galileo and Beidou. To increase the GNSS-accuracy beyond 5-10 m, the correction service swipos uses a virtual reference station (VRS), which is interpolated for the current user position based on measurements from the surrounding ANGES stations. This method enables swipos-GIS/GEO to determine the position in real-time with a cm-range accuracy.

**Recommendations:** [Standardisation and Reuse](#) (10)

**Link:** <https://www.swisstopo.admin.ch/en/geodata/geoservices/swipos.html>

## Best Practice CH5 Map viewer: viewing of geodata

**Policy domain:** Geodata

**Process owner:** swisstopo - COGIS (Coordination, Geo-Information and Services)

**Short description:** The “map viewer” facility of geo.admin.ch is an intuitive application for search, display and use of geographical information. It enables interactive presentation of maps and inclusion of specialised (thematic) geographical data using a standard Web browser.

The user can customise many map parameters, such as the area displayed and the size of the image, as well as the type of information displayed and the cartographic background.

The application enables not only on-screen display but also high-quality printouts on paper. Depending on the installation, it may also be possible to access additional information linked to the geographical objects displayed.

**Recommendations:** [Digital Government Integration](#) (7); [Standardisation and Reuse](#) (12)

**Link:** <https://www.geo.admin.ch/en/map-viewer/map-viewer.html>

## Best Practice CH 6 Cadastre of Public Law Restrictions on Landownership (PLR Cadastre)

**Policy domain:** Geodata

**Process owner:** swisstopo

**Short description:** The Cadastre of Public Law Restrictions on Landownership (PLR Cadastre) is the official system providing information about the most important public law restrictions on landownership.

Owners of land in Switzerland cannot simply use it in any way they wish. Certain requirements have to be met that have come into being as the result of legislation or decisions by the authorities. These public law restrictions on landownership (PLRs) are legally binding for landowners.

In the past, anyone who needed information about a specific public law restriction on landownership had to ask the relevant cantonal or municipal authority for the required

details, while information relating to private law restrictions could be obtained from the corresponding land register.

The PLR Cadastre greatly simplifies the search for information about public-law restrictions on landownership. In a single information system, it provides details regarding the most important restrictions relating to a specific plot of land. The system contains complete, reliable and comprehensible data from a broad variety of sources.

The PLR Cadastre results in direct cost savings, as well as other benefits that are currently difficult to quantify, including greater market transparency concerning the legal situation in the real estate sector, which results in a reduction of risk and thus in lower mortgage interest rates.

**Recommendations:** [Digital Government Integration \(6, 7\)](#); [Standardisation and Reuse \(11\)](#); [Return on Investment \(14\)](#); [Governance, Partnerships and Capabilities \(18\)](#)

**Link:** <https://www.cadastre.ch/en/oereb.html>

## Best Practice CH 7 Federal Register of Buildings and Dwellings

**Policy domain:** Geodata

**Process owner:** Federal Statistic Office (FSO), municipalities

**Short description:** The Federal Register of Buildings and Dwellings (RBD) started in 2000 for statistical purposes. At the time, it was exclusively focusing on buildings with residential use. Thanks to the full revision of the Ordinance on the RBD, which entered into force on July 1st, 2017, it now contains data on all kinds of buildings in Switzerland.

RBD data provides a view of the current buildings and dwellings stock of Switzerland, continuously updated by communal building departments. The catalogue of attributes provides a description of the data recorded in the RBD and an overview of its structure and content (not available in English).

The RBD contains all buildings with residential use in Switzerland and their dwellings since its establishment. From January 1st, 2018, it also contains non-residential buildings.

The RBD also contains information on construction projects, buildings, dwellings, entrances and streets. An identifier characterises each record of the aforementioned entities, facilitating data exchange.

**Recommendations:** [Digital Government Integration \(6, 7, 9\)](#); [Standardisation and Reuse \(11\)](#);

**Link:** <https://www.bfs.admin.ch/bfs/en/home/registers/federal-register-buildings-dwellings.html>

## Best Practice CH 8 Official geographic directories

**Policy domain:** Geodata and Geoservices

**Process owner:** swisstopo; cantons; municipalities; Federal Statistical Office (FSO)

**Short description:** The Federal Office of Topography swisstopo produces the following official directories containing geographic data:

- The official directory of towns and cities, with postcodes and perimeters

- The official street directory
- The official directory of building addresses.

These directories/datasets contain data that have been verified in terms of content and legality, and are updated on an ongoing basis. All federal, cantonal and municipal authorities can fully rely on the published data. The directories are free of charge and available to everyone: The data can be directly downloaded and are accessible via web services. The directories can be used for a broad variety of tasks: for example for statistical analyses and simulations with a geographic context, for use as a database for cartographic products, or for integration into a web service for commercial purposes.

All the official directories are produced on the basis of partnerships. The data pertaining to localities, streets and buildings are collected by the cantons (and in some cases by the municipalities as well), within the framework of the cadastral survey or other processes. The collected data are then delivered to the federal administration. Data pertaining to localities are delivered directly to swisstopo for updating the directory of towns and cities, while data relating to streets and building addresses are sent to the Federal Statistical Office (FSO) for statistical purposes. The FSO periodically supplies swisstopo with the respective datasets and swisstopo compiles and manages the directories and publishes them in a suitable form.

**Recommendations:** [Digital Government Integration](#) (9); [Standardisation and Reuse](#) (11); [Governance, Partnerships and Capabilities](#) (18)

**Link:** <https://www.cadastre.ch/en/services/service/registry.html>

## Best Practice CH 9 swissTLM3D

**Policy domain:** Geodata

**Process owner:** swisstopo

**Short description:** swissTLM3D is the large-scale topographic landscape model of Switzerland. It includes both natural and artificial landscape features, as well as name data in vector form. With a high degree of accuracy and the incorporation of a third dimension, swissTLM3D is the most extensive and accurate 3D vector dataset of Switzerland.

**Recommendations:** [Digital Government Integration](#) (7) [Standardisation and Reuse](#) (12)

**Link:** <https://www.swisstopo.admin.ch/en/geodata/landscape/tlm3d.html>

## Best Practice CH 10 Height Models

**Policy domain:** Geodata

**Process owner:** swisstopo

**Short description:** Height models are digital data sets which show the form of the earth's surface in 3D. Each set of X and Y coordinates shows a height (Z). Different products are available for various applications:

- swissALTI3D: is an extremely precise digital elevation model which describes the surface of Switzerland without vegetation and development. It is updated every six years.
- swissSURFACE3D: which models all natural and man-made objects of the surface of Switzerland in the form of a classified point cloud. These high-accuracy and high spatial density data are collected by airborne LiDAR.

- **swissSURFACE3D Raster:** is a digital surface model (DSM) which represents the earth's surface including visible and permanent landscape elements such as soil, natural cover, and all sorts of constructive work with the exception of power lines and masts.
- **swissBATHY3D:** contains bathymetric data in the form of a very accurate digital elevation model that describes the topography of the Swiss lakebeds.
- **DHM25:** Digital height model DHM25 is a set of data representing the 3D form of the earth's surface without vegetation and buildings. It is essentially based on the 1:25,000 Swiss national map.
- **DHM25 / 200m:** Digital height model DHM25 with 200 m grid is a set of data representing the 3D form of the earth's surface without vegetation and buildings. It is essentially based on the 1:25,000 Swiss national map.

**Recommendations:** [Digital Government Integration \(7\)](#) [Standardisation and Reuse \(12\)](#)

**Link:** <https://www.swisstopo.admin.ch/en/geodata/height.html>

## Best Practice CH 11 Geological Models

**Policy domain:** Geodata

**Process owner:** swisstopo

**Short description:** Geological models are digital data sets that show the subsurface in 3D and give information about its composition. In particular, these are:

- **Bedrock elevation model:** a complete model of the bedrock surface (or Quaternary base) in the Molasse Basin, the larger Alpine valleys (Rhine, Rhône, Aare, Reuss, Linth and Ticino) and portions of the Jura Mountains. This digital model has a 25-m grid spacing and shows the altitude in metres above sea level.
- **Thickness model of unconsolidated deposits:** a digital data set that describes the thickness of the unconsolidated deposits. This product is derived from the bedrock elevation model. The subtraction of the bedrock surface from the terrain surface (digital height model, DHM25) gives the thickness of unconsolidated deposits.

**Recommendations:** [Digital Government Integration \(7\)](#) [Standardisation and Reuse \(12\)](#)

**Link:** <https://www.swisstopo.admin.ch/en/geodata/geology/models.html>



## List of abbreviations and definitions

### Abbreviations

Abbreviation	Meaning
API	Application Programming Interface
COGIS	Coordination, Geo-Information and Services division
CORS	Continuously Operating Reference Station
DCAT-AP	Data Catalogue vocabulary – Application Profile
DLS	Department of Land and Survey
EFTA	European Free Trade Association
EIF	European Interoperability Framework
ELISE	European Location Interoperability Solutions for e-Government
EULF	European Union Location Framework
FDPL	Federal Data Protection Law
FOCA	Swiss Federal Office for Civil Aviation
FOEN	Swiss Federal Office for the Environment
FSDI	Federal Spatial Data Infrastructure
FSO	Federal Statistical Office
GCG	Coordinating Agency for Federal Geographic Information
GDPR	General Data Protection Regulation
GI	Geographic Information
GNSS	Global Navigation Satellite System
G2B	Government to Business
G2C	Government to Citizen
G2G	Government to Government
ICT	Information and Communication Technology
IHO	International Hydrographic Organization
INSPIRE	Infrastructure for Spatial Information in the European Community
INTERLIS	A standard for the modeling and integration of geodata into contemporary and future geographic information systems
ISA <sup>2</sup>	Interoperability Solutions for European Public Administrations, Businesses and Citizens Programme
ISO	International Standard Organisation
LIFO	Location Interoperability Framework Observatory
NaDIM	National Data Infrastructure for Mobility
NGO	Non-Governmental Organisation
NIFO	National Interoperability Framework Observatory
NMA	National Mapping Agency
OGC	Open Geospatial Consortium
OSM	Open Street Map
PLR	Public-law Restrictions on Landownership
PSI	Public Sector Information
REST	Representational state transfer
SDI	Spatial Data Infrastructure
SECR	State Enterprise Centre of Registers
SME	Small-Medium Enterprise
SOGI	Swiss Organisation for Geographic Information
SUSI	Swiss U-Space Implementation
UN	United Nations

## Definitions

Term	Meaning	Link
Application Programming Interface (API)	A set of functions and procedures that allow the creation of applications which access the features or data of an operating system, application, or other service.	<a href="#">Application Programming Interface   Joinup (europa.eu)</a>
Authentic data	Data that provides an accurate representation of reality with quality parameters that are fit for the intended purposes.	<a href="#">Authentic data   Joinup (europa.eu)</a>
Authoritative data	Data from officially regarded sources. A subset of spatial data may be described as 'authoritative data', where it has legal value because it is defined by a competent authority.	<a href="#">Authoritative data   Joinup (europa.eu)</a>
Core location dataset / High value dataset	Open Data Directive introduces the concept of 'high-value datasets' as datasets holding the potential to (i) generate significant socio-economic or environmental benefits and innovative services, (ii) benefit a high number of users, in particular SMEs, (iii) assist in generating revenues, and (iv) be combined with other datasets. Given this, the Directive requires that such datasets are available free of charge, are provided via Application Programming Interfaces (APIs) and as a bulk download, where relevant, and are machine-readable. The Directive does not include the specific list of high-value datasets—which is expected in the future—but only their thematic categories, one of which is 'Geospatial'. The 'high value dataset' concept is also considered in national data policy and programmes in different European countries, typically incorporating 'core' datasets, including geospatial data.	<a href="#">High Value Dataset   Joinup (europa.eu)</a>
Core reference dataset	Core reference dataset can be defined as the minimum set of authoritative, harmonised and homogeneous framework data needed to either meet common requirements for applications at cross-border, European and global levels or to geo-reference and locate other thematic data. In the latter case, core data may be used as a framework on which other richer, more detailed, thematic geospatial and statistical data would rely.	<a href="http://ggim.un.org/meetings/GGIM-committee/documents/GGIM5/E-C20-2015-4%20Fundamental%20Data%20Themes%20Report.pdf">http://ggim.un.org/meetings/GGIM-committee/documents/GGIM5/E-C20-2015-4%20Fundamental%20Data%20Themes%20Report.pdf</a>
Digital government	Government designed and operated to take advantage of information in creating, optimising, and transforming, government services.	<a href="#">Digital government   Joinup (europa.eu)</a>

Term	Meaning	Link
European Single Procurement Document	The European Single Procurement Document (ESPD) is a self-declaration by economic operators providing preliminary evidence replacing the certificates issued by public authorities or third parties. As provided in Article 59 of Directive 2014/24/EU, it is a formal statement by the economic operator that it is not in one of the situations in which economic operators shall or may be excluded; that it meets the relevant selection criteria and that, where applicable, it fulfils the objective rules and criteria that have been set out for the purpose of limiting the number of otherwise qualified candidates to be invited to participate. Its objective is to reduce the administrative burden arising from the requirement to produce a substantial number of certificates or other documents related to exclusion and selection criteria	<a href="#">Commission Implementing Regulation (EU) 2016/7 of 5 January 2016</a>
Evidence-based policy making	The development of public policy which is informed by objective evidence, e.g. through data related to the content of the policy.	<a href="#">Evidence-based policy making   Joinup (europa.eu)</a>
GeoDCAT-AP specification	Data Catalogue vocabulary (DCAT) Application Profile extension for describing geospatial datasets, dataset series, and services.	<a href="#">GeoDCAT-AP   Joinup (europa.eu)</a>
Geographical Information (GI) Champion	The GI Champion can be appointed to drive through the changes related to running a major GI improvement programme, promoting public sector modernisation through the use of GI, and ensure that the organisation is aware of and convey the benefits of geospatial information and technologies. A GI champion may also be appointed with a pan-government remit.	<a href="#">LIFO Guidelines and Recommendations</a>
Key digital public services	The most frequently accessed and sometimes mandatory public services which are delivered with the extensive use of ICT, e.g. registration of land and property, health and welfare, civil status registration, transport, environmental protection, energy production and distribution, public safety, transport, public education etc. National legislation may define which services must be considered key.	<a href="https://joinup.ec.europa.eu/collection/european-union-location-framework-eulf/document/recommendation-6">https://joinup.ec.europa.eu/collection/european-union-location-framework-eulf/document/recommendation-6</a>
Location data framework	Location data framework describes all the elements – including data assets, standards and technologies, policies and guidance, people and organisations – that are required to unlock the power of location. An SDI is a location data framework	<a href="#">LIFO Guidelines and Recommendations Unlocking the Power of Location: The UK's geospatial strategy 2020 to 2025</a>
Location information strategy	A strategic approach for managing and maximising the value of location information.	<a href="#">Location information strategy   Joinup (europa.eu)</a>

Term	Meaning	Link
Open and collaborative methodology	Any system of innovation or production that relies on goal-oriented yet loosely coordinated participants who interact to create a product (or service) of economic value, which they make available to contributors and non-contributors alike. Prominently used for the development of open source software.	<a href="https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1096442">https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1096442</a>
OpenAPI	Specification for machine-readable interface files for describing, producing, consuming, and visualising RESTful web services.	<a href="https://swagger.io/specification/">https://swagger.io/specification/</a>
Open licence	An open licence is a way for the copyright holder (creator or other rightholder) to grant the general public the legal permission to use their work. The applied open licence is usually indicated directly on the work and wherever the work is shared. As in the case of other licences, open licences do not imply a transfer of copyright or other intellectual property rights. Someone granting an open licence for their work still remains the copyright holder of their materials and can themselves use the materials as they wish, e.g. to commercialise their project outcomes.	<a href="https://ec.europa.eu/programmes/erasmus-plus/programme-guide/part-c/important-contractual-provisions/open-licence-intellectual-property-rights_en">https://ec.europa.eu/programmes/erasmus-plus/programme-guide/part-c/important-contractual-provisions/open-licence-intellectual-property-rights_en</a>
RESTful web services	Web services built on Representational State Transfer (REST) principles, where resources used by the services are made available through URIs (Uniform Resource Identifier) and can be updated without affecting the service	<a href="https://docs.oracle.com/javase/6/tutorial/doc/gijqy.html">https://docs.oracle.com/javase/6/tutorial/doc/gijqy.html</a>
Sector legislation	Legislation about a particular domain (e.g. health, environment) or sub-domain (e.g. hospitals, water). Within INSPIRE, reference can be made to the nine thematic clusters, which have associated legislation, e.g. E-PTRT (European Pollutant Release and Transfer Register) IED (Industrial Emissions Directive).	<a href="https://inspire.ec.europa.eu/call-facilitators-%E2%80%93-thematic-clusters/50">https://inspire.ec.europa.eu/call-facilitators-%E2%80%93-thematic-clusters/50</a>
Spatial Data Infrastructure (SDI)	In general terms, a Spatial Data Infrastructure (SDI) may be defined as ‘a framework of policies, institutional arrangements, technologies, data, and people that enable the effective sharing and use of geographic information’ [Bernard et al, 2005]. INSPIRE as an SDI for European environmental policy is defined as ‘metadata, spatial data sets and spatial data services, network services and technologies, agreements on sharing, access and use, and coordination and monitoring mechanisms, processes and procedures, established, operated or made available in accordance with the Directive’.	<a href="#">Spatial Data Infrastructure   Joinup (europa.eu)</a>

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## Annex 1: LIFO 2020 Scoring methodology

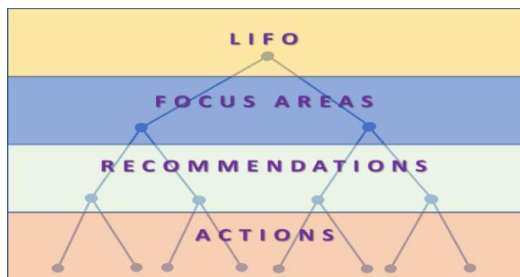


Figure 15 - Hierarchy of indicators and indexes

The LIFO analytical model, described in the *LIFO 2020 Guidelines and recommendations*<sup>66</sup>, is based on a hierarchy of indicators and indexes, as represented in [Figure 15](#): from bottom to top, (action) indicators, recommendation indexes, focus area indexes and LIFO index.

**(Action) Indicators:** A number of actions<sup>67</sup> have been selected in the EULF Blueprint as being representative of the scope of the recommendations to which they belong. An indicator has been designed to measure how monitored countries are progressing towards the “vision” outlined in the EULF Blueprint for each of these actions. Each primary indicator is represented by a code **Qx.y.z** where x is the recommendation number, y the progressive indicator number for that recommendation and z (where applicable) a second-level indicator providing additional information on the corresponding Qx.y first level indicator. Information to calculate each primary indicator is collected through the replies provided by participating countries to a question for each indicator. The model also includes secondary indicators, represented by a code **Sx.y**. These latter are computed reusing information from existing sources, for example, the INSPIRE monitoring. See [Annex 2](#) for a list of the indicators and pertinent questions for each recommendation.

Each indicator is calculated on a specific scale, which best reflects the nature of the action (e.g. if it can be measured over a continuous or a discrete scale, if it is a binary phenomenon, i.e. yes/no or similar, etc.). Indicators are then normalised over a scale of 0-1, as follows:

*Score attributed to the answer / maximum applicable value*, where the maximum applicable value is the upper end of the scale that the non-normalised value of the indicator can reach.

Note: Optional questions in the LIFO survey capture supplementary information relevant to corresponding mandatory questions about the actions. The mandatory questions (i.e. those marked “\*” in the survey) are scored, whereas the optional questions are not scored.

**(Multi-level) indexes:** indexes aggregate the action indicators at the levels of recommendations, focus areas, and LIFO overall to represent each country's performance at the respective levels. The relationships between (action) indicators, recommendation indexes, focus area indexes and the overall LIFO index are described in [Table 7](#).

Level	No.	Scoring method
LIFO	1	Average of the 5 focus area indexes
Focus area	5	Average of scores for all recommendations associated with a focus area
Recommendation	19	Average of normalised scores for all indicators associated with a recommendation
Action	48	Scores calculated using different scoring methods converted to standard normalised scores in range 0-1.

Table 7 – Relationships between indicators and indexes

Action indicators, recommendation indexes and focus area indexes are thus equally weighted in the calculation of their respective upper-level indexes.

Note: Some questions have a “don't know” response as an option. Respondents are encouraged to provide answers wherever possible. Where a “don't know” response is given, the indicator gets a null score. This is shown as zero in the indicator charts, and the indicator is ignored in calculating the index scores.

<sup>66</sup> [https://joinup.ec.europa.eu/sites/default/files/inline-files/2020\\_LIFO\\_Guidelines\\_2.pdf](https://joinup.ec.europa.eu/sites/default/files/inline-files/2020_LIFO_Guidelines_2.pdf)

<sup>67</sup> Described in the “How” section of each Recommendation.

## Annex 2: LIFO 2020 Indicators

Focus Area: Policy and Strategy Alignment			Changes vs 2019
No.	Indicator	Question	
Recommendation 1			
Q1.1	Alignment between location and digital government strategies	Is there a location strategy in your country that is closely connected to your digital government strategy?	Change in scale
Q1.1.1	Link to strategies	Please supply links to the location strategy and digital government strategy.	
Q1.2	Use in digital government of authoritative location datasets and services	To what extent is the use in digital government of authoritative location datasets and services regulated by legislation and/or binding agreements?	
Recommendation 2			
Q2.1	Licensing policy	To what extent is location data available free of charge under an open licence without restrictions or with minimum restrictions?	Change in scale
Q2.1.1	Licensing policy – covered datasets	Which of the following core location datasets with high importance for multiple external users (also known as "high value datasets" in national and European open data strategies) can be accessed (e.g. through APIs or downloads) free of charge under an open licence without restrictions or with minimum restrictions?:	New question
Q2.2	Core reference data policy on location data	Are core location reference datasets (for the list of core location datasets please refer to Q2.1.1) made available as part of a broader core reference data policy (which also includes people, businesses, vehicles etc.)?	Change in scale
Q2.3	Use of common data licensing frameworks	To what extent is location data available under a common licensing framework for all government data?	Change in scale
Q2.4	Coverage of location data by national guidelines on the publication of Public Sector Information	Do your pan-government guidelines on the publication of public sector data cover location aspects? "Cover location aspects" means that in the guidelines some specific geospatial topics are highlighted (e.g. formats, encoding, accessibility through specific web services, specific legislation,).	
Recommendation 3			
Q3.1	Preparedness for GDPR under location aspects	How well-prepared are controllers and processors of public sector location data in your country for GDPR, including awareness of	



		potential location data privacy issues and processes in place to comply with the rights of data subjects?	
<b>Recommendation 4</b>			
Q4.1	Use of location-based analysis for evidence-based policy making	Is location-based evidence and analysis used to help in developing relevant policies and monitoring outcomes?	
<b>Recommendation 5</b>			
Q5.1	References to INSPIRE and relevant standards in procurement documents	For public sector procurements of location information or services, what references are made to INSPIRE and relevant standards in the procurement documents?	

<b>Focus Area: Digital Government Integration</b>			<b>Changes vs 2019</b>
<b>No.</b>	<b>Indicator</b>	<b>Question</b>	
<b>Recommendation 6</b>			
Q6.1	Improvement of location information use in digital public services	To what extent is there a process for identifying opportunities and implementing improvements to key digital public services in their use of location information, including considering new business and delivery models?	Change in scale
Q6.2	Optimal use of location information is used optimally in key digital public services	Please select up to 6 sectors where location information has the most significant role to play in digital public services. For these sectors, please specify how well 'optimised' is the use of location data in digital public services. In this respect, 'optimisation' relates to extent of use and contribution to innovation and quality of service.	Change in scale
<b>Recommendation 7</b>			
Q7.1	Use of SDI in cross-government digital services	To what extent is the SDI used in delivering digital public services across government (in different sectors and levels of government)?	Change in scale
S7.1	implementation status of the INSPIRE directive	Average of indicators for the following five actions in the INSPIRE country fiche: <ul style="list-style-type: none"> <li>- Availability of spatial data and services</li> <li>- Conformity of metadata</li> <li>- Conformity of spatial data sets</li> <li>- Accessibility of spatial data sets through view and download services</li> <li>- Conformity of the network services</li> </ul>	Change of calculation method for the INSPIRE country fiche

Q7.2	Use of SDI in cross-border services	Is the country actively involved in delivering cross-border digital public services using their spatial data infrastructure (SDI)?	Change in scale
Q7.3	SDI approach used	Please specify the main SDI approach used for delivery of key digital public services in the sectors selected in 6.2.	New question
Q7.4	Use of the public sector SDI by private sector and other organisations (e.g. NGOs)	To what extent is the public sector SDI used by the private sector and other organisations (e.g. NGOs) for delivery of 'new and innovative' applications, products and services?	
<b>Recommendation 8</b>			
Q8.1	Use of an open and collaborative methodology in location-enabled digital public services	To what extent is an open and collaborative methodology applied, to design and improve location-enabled digital public services at local, sub-national or national level (e.g. through consultations, user groups, feedback requests, iterative development)?	
Q8.1.1	Level of government where a collaborative approach is used	At what level of government is the collaborative approach applied?	Single choice in 2019, multiple choice in 2020
Q8.2	Collaboration with external parties in service delivery	When developing or delivering location-based digital public services, in what ways are external parties involved? This includes the private sector, NGOs and citizens.	Change in scale
<b>Recommendation 9</b>			
Q9.1	Approach for integration of statistical and location information	What actions are implemented for the integration of location and statistical information in the production of location-based statistics?	

<b>Focus Area: Standardisation and Reuse</b>			<b>Changes vs 2019</b>
<b>No.</b>	<b>Indicator</b>	<b>Question</b>	
<b>Recommendation 10</b>			
Q.10.1	Adoption of a common architectural approach	In your country, does the architecture for location data and services in the SDI fit within a broader national ICT architecture approach that is applied in the design, re-engineering, interconnectivity and reuse of ICT and data in digital public services?	
Q10.2	Procedure to incorporate new technological features	Please describe the approach (if any) to discover, explore and	

		incorporate new technological features or emerging technologies.	
Q10.3	Status of development of APIs for INSPIRE / SDI	Please describe the status of development of APIs for SDI / INSPIRE.	
Q10.3.1	Access to high-value location datasets through APIs	Which core "high value" location datasets can be accessed using APIs?	New question
Q10.3.2	Action to foster APIs take-up	Where there are APIs for location datasets, what steps are commonly taken to stimulate take-up and ensure they are as useful as possible?	New question
<b>Recommendation 11</b>			
Q11.1	Reuse of generic ICT solutions in the SDI	Please describe the reuse status of generic ICT solutions in the SDI.	Single choice in 2019, multiple choice in 2020
Q11.2	Implementation of location information registers	What registers of location information are implemented?	
<b>Recommendation 12</b>			
Q12.1	Use of geospatial standards	What type of geospatial domain standards are used in your country?	Change of question
S12.1	Conformity of spatial data sets to INSPIRE implementing rules	Conformity of spatial data sets to INSPIRE implementing rules and technical guidelines (from INSPIRE monitoring)	
Q12.2	Use of a standardised metadata approach	To what extent is a standardised metadata approach adopted to facilitate discoverability of spatial and non-spatial data through joint access mechanisms such as those listed in the question Q16.1?	New question
Q12.2.1	Use of specifications for combining spatial and non-spatial metadata	Where an approach to facilitate a joint discoverability of spatial and non-spatial data is adopted, what specifications and tools are used to a significant degree to combine spatial with non-spatial metadata in national implementations?	New question
S12.2	Conformity of the INSPIRE network services with INSPIRE implementing rules	Conformity of the INSPIRE network services with Regulation (EC) No 976/2009 (from INSPIRE monitoring)	
<b>Recommendation 13</b>			
Q13.1	Approach to location data quality	What actions are typically implemented to assure quality of location data in your country?	
Q13.1.1	Use of data quality standards	What data quality standard is applied to location data?	New question
Q13.2	Approach to location data quality governance	What type of actions relating to location data quality governance are put in place in your country?	

Q13.2.1	Collection of feedback from users	Where feedback is obtained from users, what approach is taken?	
<b>Focus Area: Return on Investment</b>			<b>Changes vs 2019</b>
<b>No.</b>	<b>Indicator</b>	<b>Question</b>	
<b>Recommendation 14</b>			
Q14.1	Performance monitoring of location-enabled digital public services	What of the following elements are evaluated to assess the efficiency and effectiveness of location-based services in your country?	
Q14.1.1	Performance monitoring scope	Are the measurements done: <input type="checkbox"/> At a project or service level <input type="checkbox"/> At an organisational level <input type="checkbox"/> At an SDI / national level <input type="checkbox"/> A combination of the above	
Q14.2	Approach to impact-based improvement	What actions are implemented for impact-based improvement in location-enabled processes and services in your country?	
<b>Recommendation 15</b>			
Q15.1	Approach to communication of benefits	Is communication delivered on the availability and benefits of location data and location-enabled digital public services to raise awareness and understanding using, for example, factsheets, news articles, web-based communication, videos, events?	Change of question
<b>Recommendation 16</b>			
Q16.1	Ease of searching, finding and accessing location data	What measures are implemented to make the process of searching, finding and accessing location data and web services as easy as possible for companies, research institutions, citizens and other interested parties?	
S16.1	Existence of policies supporting the reuse of PSI	Existence of policies supporting the reuse of Public Sector Information by the private sector (from the Open Data Maturity Report)	
Q16.2	Support to the development of products and services by external parties	Which of the following actions are implemented in your country to actively support private, non-profit and academic actors in the development of new products, services or research using public sector location data?	Change of scale
Q16.3	Existence of a strategic approach to funding location reference data	Is there a strategic approach to funding public sector location reference data to make access at point of use cost effective?	

Focus Area: Governance, Partnerships and Capabilities			Changes vs 2019
No.	Indicator	Question	
<b>Recommendation 17</b>			
Q17.1	Involvement of stakeholders in decision making on location information in digital government	To what extent are all relevant communities (location and digital government), domains (thematic), administrative levels (central and local) and sectors (public, private, academic, society) involved in decision making on the role of location information in Digital Government?	Multiple choice in 2019, single choice in 2020
Q17.2	Coordinated governance of SDI and digital government	To what extent do organisations responsible for SDI and Digital Government coordination deal jointly with the governance of the SDI in the context of Digital Government?	Multiple choice in 2019, single choice in 2020
<b>Recommendation 18</b>			
Q18.1	Use of formal agreements between public authorities in the country to operate location data services	To what extent do formal agreements exist between public authorities in the country to finance, build and operate location data services or digital public services using location data?	
Q18.2	Use of formal agreements to operate cross-border location data services	To what extent do formal agreements exist with public authorities in other countries to finance, build and operate cross-border location data services or digital public services using location data?	
Q18.3	Use of public-private partnerships to operate location data services	To what extent do public-private partnerships exist to finance, build and operate location data services or digital public services using location data?	
<b>Recommendation 19</b>			
Q19.1	Use of a strategic approach to geospatial capacity building	To what extent is there a strategic approach to skills and training for innovative geospatial solutions?	Multiple choice in 2019, single choice in 2020
Q19.2	Awareness raising initiatives in the geospatial domain	What type of initiatives are organised to raise awareness and develop geospatial skills?	Change in scale

Note: Some indicators have been modified in LIFO 2020 compared with LIFO 2019<sup>68</sup>, with the aim to improve the capability of the LIFO analytical model to represent consistently the state

<sup>68</sup> LIFO 2019 indicators are listed at <https://joinup.ec.europa.eu/node/704929>, while LIFO 2020 indicators are listed at <https://joinup.ec.europa.eu/node/704251>



of play of location interoperability at country and European level. The main changes, and the focus areas / recommendations impacted are:

- Digital Government Integration:
  - Reduced focus on INSPIRE as reference SDI for the delivery of location-enabled services ([Recommendation 7](#));
  - Changes in the calculation of INSPIRE country fiche indicators ([Recommendation 7](#)).
- Standardisation and Reuse:
  - More emphasis on the use of APIs for access to and reuse of location data, with new indicators ([Recommendation 10](#));
  - New indicators on the use of metadata for joint discoverability of spatial and non-spatial data ([Recommendation 12](#)).
- Governance, partnerships and capabilities:
  - Questions on governance (approaches to joint involvement of all relevant stakeholders in the governance of SDI – [Recommendation 17](#)) and capabilities (approaches to geospatial training and skills - [Recommendation 19](#)) have passed from multiple choice to single choice

Where changes have been made to the indicators from 2019 to 2020, they are classified as follows:

- “Change in scale”: one or more options of reply have been added (or eliminated);
- “Change of question”: the question has been completely redrafted;
- “New question”: the question was not included in LIFO 2019 questionnaire;
- “Single choice in 2019, multiple choice in 2020”: in 2019 it was possible to select only one option as reply, in 2020 more than one option can be selected;
- “Multiple choice in 2019, single choice in 2020”: in 2019 it was possible to select more than one option as reply, in 2020 only one option can be selected.

## Annex 3: LIFO 2020 Additional information: Switzerland

Title	Attachment <sup>69</sup>
LIFO Survey questionnaire 2020 – Switzerland	 LIFO Survey 2020 Switzerland
LIFO Survey questionnaire 2020 scores and charts – Switzerland	 LIFO 2020 scores and charts Switzerland

<sup>69</sup> Attachments can be accessed by clicking on the respective icon when opening the factsheet in Adobe Acrobat Reader, provided that the application preferences are set to do so.