



LIFO: Location Interoperability Framework Observatory

2020 COUNTRY FACTSHEET

SLOVAKIA



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1. Introduction



The Location Interoperability Framework Observatory (LIFO¹) 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) Blueprint² (see [Figure 1](#)).

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

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

LIFO is coordinated by the European Location Interoperability Solutions for e-Government (ELISE)⁵ action in the Interoperability Solutions for European Public Administrations, Businesses and Citizens (ISA²)⁶ programme.



Policy and strategy alignment

a consistent EU and Member State policy and legislative approach where location information plays a significant role



Digital government integration

making location a key enabler in G2B, G2C and G2G digital government processes and systems



Standardisation and reuse

adoption of recognised geospatial and location-based standards and technologies, enabling interoperability and reuse



Return on investment

ensuring funding of activities involving location information is value for money, and taking action to stimulate innovation and growth



Governance, partnerships and capabilities

effective decision making, collaboration, knowledge and skills related to the provision and use of location information in the context of digital government

Figure 1 - EULF Blueprint focus areas

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

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

³ https://ec.europa.eu/isa2/eif_en

⁴ https://ec.europa.eu/isa2/solutions/nifo_en

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

⁶ 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 model⁷. 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 Directive⁸. 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 Directive⁹, obligations under the General Data Protection Regulation (GDPR)¹⁰, approaches under the Public Procurement Directive¹¹, and factors relevant to the EIF¹².

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*¹³ and a *European State of Play Report*¹⁴ and are available for users to explore in the *LIFO interactive dashboards*¹⁵, which are linked in their turn to the *EULF Blueprint*¹⁶.



Figure 2 - LIFO online resources

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

⁸ 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.”

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

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

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

¹² 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>

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

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

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

¹⁶ <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.

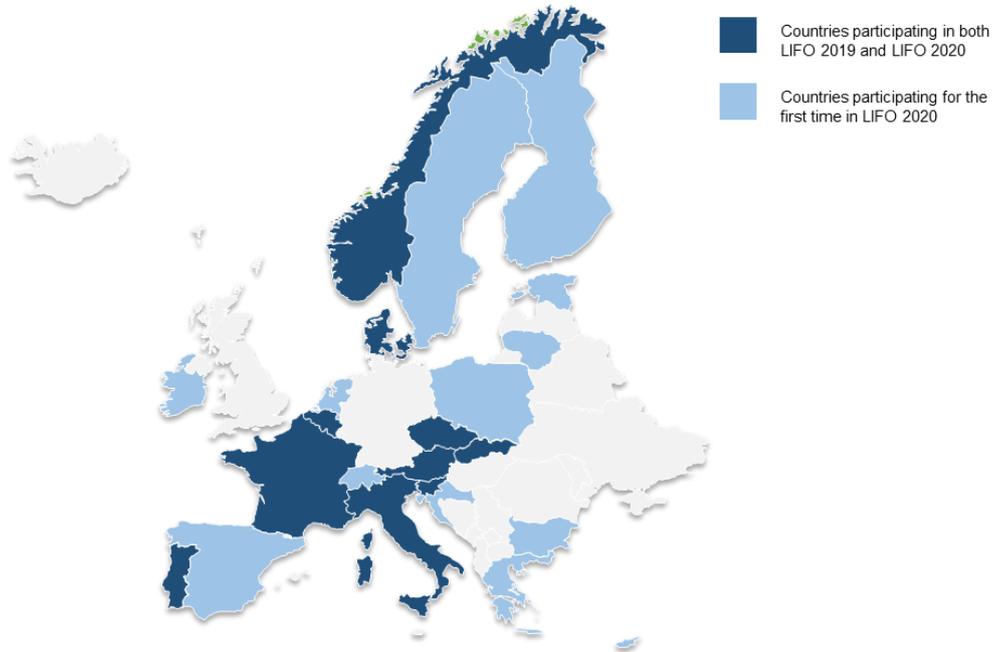


Figure 3 - LIFO participating countries in 2019 and 2020

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](#))¹⁷.

¹⁷ 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 Slovakia in 2020. Its main section is the [Location Interoperability State of Play](#) where information is provided at two levels:

- **Overview of results**, organised as follows:
 - [2020 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;
 - [2019/2020 Comparison](#): compares the overall results between 2019 and 2020 across the five focus areas for the country and in relation to European trends; these comparisons are displayed in a comprehensive chart;
- **Detailed results by focus area**, organised in five sections, each with the following:
 - **2020 results**: 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](#).
 - **2019/2020 comparison**: compares the results between 2019 and 2020 for each recommendation in the focus area, with a chart and explanatory text.

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;
- [Annex 3](#): Additional information for Slovakia comprising the questionnaire response, scores and charts from the response, and a 2019/2020 comparison table.

The 2020 LIFO monitoring information for Slovakia has been provided by the *Ministerstvo životného prostredia Slovenskej republiky (Ministry of Environment of the Slovak Republic - MoE)*.

3. Location Interoperability State of Play

3.1. Overview

3.1.1 2020 Results

The information collected through the LIFO 2020 data collection indicates that Slovakia is close to the European averages in the “Standardisation and Reuse” and “Return on Investment” focus areas and shows somewhat larger gaps in the “Policy and Strategy Alignment” and “Governance, Partnerships and Capabilities” focus areas. The gap in the “Digital Government Integration” is, on the other hand, quite significant and brings down substantially the overall performance of the country in terms of location interoperability.

“Return on Investment” is the focus area with the highest score, thanks to the large array of measures implemented to facilitate searching, finding and accessing location data and web services for companies, research institutions, citizens and other interested parties and to the approach to funding public sector location reference data initiatives. On the other hand, the identification and communication of the benefits of using location information in digital public services deserves higher attention.

“Policy and Strategy Alignment” is the area with the second highest score, thanks to the standard-based approach to public procurements of location data and services and to the cross-sector legislation mandating the use of authoritative location data. Nonetheless, there are also relevant weaknesses: the level of preparedness of public administrations for the GDPR is still low. Despite the initial efforts for synergies between INSPIRE and eGovernment, there is still a need for closer policy alignment between the two domains.

In the “Standardisation and Reuse” focus area, strong support is reported for global and European standards and open data initiatives, and public administrations have implemented many registers of location information. A good number of core location datasets can be accessed through APIs. The main weaknesses consist in the lack of a standardised approach to facilitate discoverability of spatial and non-spatial data through joint access mechanisms and the still limited conformity of datasets and network services to INSPIRE implementing regulations.

The “Governance, Partnerships and Capabilities” focus area has registered some positive development, being the focus area where the index has increased the most compared with 2019. This is due to the formal agreements in place between public authorities in the country, as well as to the public-private partnerships, to finance, build and operate a large number of location data services or digital public services using location data. Several stakeholders are involved in decision making on the role of SDI in digital transformation. A wide-ranging project has been launched to reinforce the "soft skills" support to INSPIRE implementation in synergy with eGovernment. On the negative side, no formal agreements are reported to finance, build and operate cross-border location-enabled digital services.

The focus area with the greatest room for improvement is “Digital Government Integration”, where the use of location data in digital public services is generally sub-optimal, the actions taken to integrate location and non-location data in statistics are still very limited and the country is not involved in delivering cross-border digital public services using the country's spatial data infrastructure (SDI). A positive note is the adoption of an open and collaborative methodology to design and improve location-enabled digital public services.

The value of the overall LIFO index combining the scores for all focus areas is 0.45, which reflects a number of gaps in Slovakia's practices under various areas of location interoperability. This compares with a European average of 0.55.



Figure 4 - Overall EULF Blueprint implementation

The following table summarises Slovakia's main strengths and weaknesses across the five focus areas:

Focus Area	Strengths	Weaknesses
 <i>Policy and Strategy Alignment</i>	<ul style="list-style-type: none"> Initial synergies have been established between the eGovernment and INSPIRE domains There is cross-sector legislation mandating the use of authoritative location data Specific references are made to the applicable parts of the INSPIRE Directive in public procurements of location information and services 	<ul style="list-style-type: none"> There is a need for closer eGovernment and INSPIRE policy alignment There are still considerable gaps in the preparedness for GDPR under the location privacy aspects

Focus Area	Strengths	Weaknesses
 <p><i>Digital Government Integration</i></p>	<ul style="list-style-type: none"> • Raising awareness of the importance of location information in digital public services • An open and collaborative methodology is adopted to design and improve location-enabled digital public services 	<ul style="list-style-type: none"> • Location support is still not clearly defined under the priority government digital services • Slovakia is not involved in delivering cross-border digital public services using the country's spatial data infrastructure (SDI) • Only limited actions have been undertaken to integrate location and non-location data in statistics
 <p><i>Standardisation and Reuse</i></p>	<ul style="list-style-type: none"> • Strong support for global and European standards and open data initiatives • Public administrations have implemented many registers of location information • A good number of core location datasets can be accessed through APIs 	<ul style="list-style-type: none"> • Ad-hoc specifications and tools are used for metadata in different situations • Conformity of datasets and network services to INSPIRE implementing regulations is still limited
 <p><i>Return on Investment</i></p>	<ul style="list-style-type: none"> • There are initiatives to fund improvements to location reference data • Strengthened evaluation of (public) value for money 	<ul style="list-style-type: none"> • Identification and communication of the benefits of integrating and using location information in digital public services deserves higher attention
 <p><i>Governance, Partnerships and Capabilities</i></p>	<ul style="list-style-type: none"> • Several stakeholders are involved in decision making on the role of SDI in digital transformation • There are some public-private partnerships to build and operate location-enabled public services • A wide-ranging project is aiming to reinforce the "soft skills" support to INSPIRE implementation in synergy with eGovernment 	<ul style="list-style-type: none"> • No formal agreements exist to finance, build and operate cross-border location data services or digital public services using location data

Table 1 – Strengths and Weaknesses by Focus Area

3.1.2 2019/2020 Comparison

Slovakia is one of the countries that has participated in both LIFO 2019 and LIFO 2020 data collection. Comparisons over the two years can be made both within the country and with the European averages (see [Figure 5](#)).

As the number of participants has increased significantly from 10 in 2019 to 23 in 2020 (including the 10 from 2019), the figure shows two different 2020 European averages for comparison: firstly, the average for all countries participating in 2020 (yellow line); secondly, the average for the subset of countries that participated in both years (green line). The same figure also shows the 2019 averages.

The structure of the EULF Blueprint (and therefore of LIFO) in terms of focus areas and recommendations has remained the same over the two years, allowing valid comparisons at these levels. However, changes were made in 2020 to a small number of specific indicators to reflect learning from 2019 and latest developments impacting location interoperability in Europe. Further details are available in [Annex 2](#).

Between 2019 and 2020, the LIFO index for Slovakia has remained at 0.45. This is linked to the confirmation of practices reported in 2019 under all recommendations. All variations in the different focus areas have been quite small and mostly linked to the recalibration of some indicators; where this has not been the case, the positive and negative variations have anyway compensated each other.

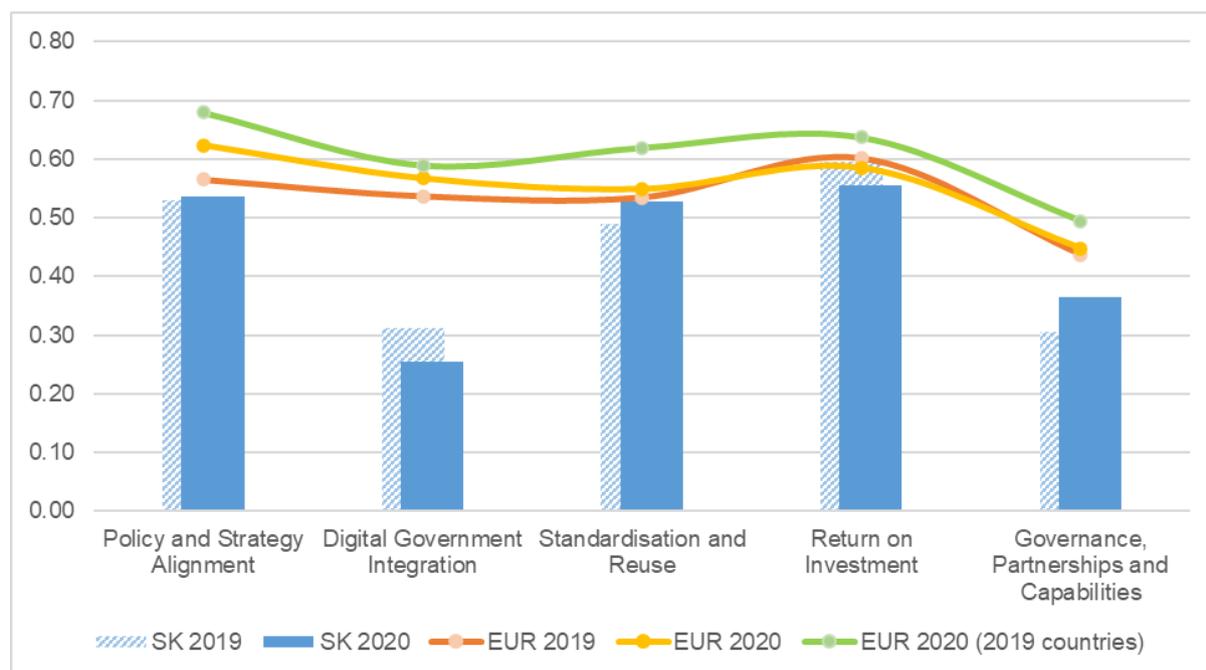


Figure 5 - Comparison between LIFO 2019 and LIFO 2020 – Slovakia

The score for the “Policy and Strategy Alignment” focus area has been basically confirmed (0.54 against 0.53 in 2019). This reflects the continuation of the practices. The slight variation is connected to the recalibration of a few indicators. “

“Digital Government Integration” has seen a decrease of the index by 0.06, mostly due to the changes made to two indicators out of three under [Recommendation 8](#). The resulting assessment aims to represent the current maturity in a more realistic way, and anyway no improvements have been registered concerning the adoption of an open and collaborative methodology to design and improve location-enabled digital public services. This has widened the gap with the average from 0.23 to 0.32.

“Standardisation and Reuse” has seen an increase by 0.04 compared to 2019. The main factor that has determined this trend is the availability of a series of location data APIs for SDI / INSPIRE datasets, a development that was reported as being in the testing phase in 2019.

The decrease of the index by 0.04 in the “Return on Investment” focus area is linked to [Recommendation 15](#), where the main indicator now gives greater emphasis to the quality and frequency of the identification and communication of benefits of location information.

As mentioned above, “Governance, Partnerships and Capabilities” is the focus area where the strongest improvement has been reported, with its index increased by 0.07 (from 0.30 in 2019 to 0.37 in 2020). This step forward is due to the public-private partnerships now reported under [Recommendation 18](#) and to the strengthened approach to capacity building under [Recommendation 19](#). Slovakia has followed the trend of the countries that participated in both years: the green line, representing the pertinent 2020 average, is higher by 0.5 compared with the European average of 2019.

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.
Recommendation 1	Connect location information and digital government strategies in all legal and policy instruments
Recommendation 2	Make location information policy integral to, and aligned with, wider data policy at all levels of government
Recommendation 3	Ensure all measures are in place, consistent with legal requirements, to protect personal privacy when processing location data
Recommendation 4	Make effective use of location-based analysis for evidence-based policy making
Recommendation 5	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

3.2.1 2020 Results

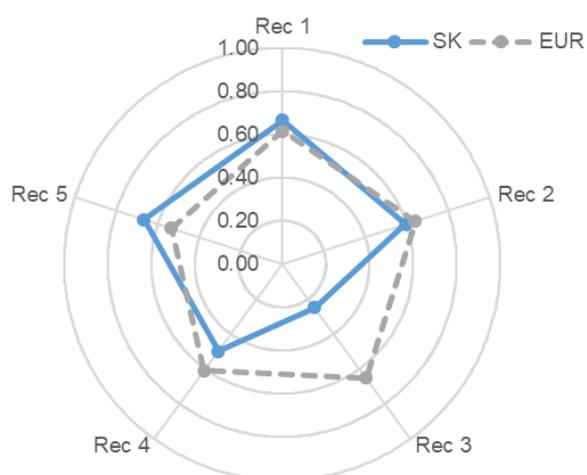


Figure 6 - Policy and Strategy Alignment - scores by recommendation

The scores for each recommendation in the "Policy and Strategy Alignment" focus area are shown in [Figure 6](#) and the underlying indicator scores for each recommendation are shown in [Figure 7](#). In both cases, the country scores are compared with the EUR averages.

The "Policy and Strategy Alignment" focus area index for Slovakia is 0.54, somewhat below the European average of 0.62. Within this result, there are differences between the individual recommendations. As shown in [Figure 6](#), the indexes for [Recommendation 1](#), [Recommendation 2](#), and [Recommendation 5](#) are close to or above the EUR averages, while the indexes for [Recommendation 4](#) and, most

of all, [Recommendation 3](#) bring down the country's overall positioning in this focus area.

There is some alignment between location and digital government strategies ([Recommendation 1](#)). The country has set up a location strategy¹⁸ based on the implementation of the INSPIRE Directive, with direct reference to the country's digital government strategy¹⁹. The INSPIRE implementation strategy in the Slovak Republic is a framework document providing an overview of the objectives and requirements arising from the INSPIRE Directive in a time horizon up to 2021. Further to this, general cross-sector legislation regulates the use of authoritative location datasets and services in digital

¹⁸ <http://inspire.gov.sk/koordinacia/rove-sk/strategia-implementacie>

¹⁹ http://informatizacia.sk/ext_dok-strategicky_dokument_2014_2020_en/16622c. The digital government strategy states however that "it is advisable to use the existing standardised geographical information generated in accordance with the INSPIRE directive", at least for the development of the Atlas of passive infrastructure.

government. The policy framework is evolving. Recently, the Ministry of Investments, Regional Development and Informatisation (MIRRI) initiated preparations for a new Data act, where location related aspects might be also covered. At the same time, the Ministry of Environment (MoE) has started the revision of the current national spatial data infrastructure policy framework in order to reflect the latest EU policy updates, strengthen the synergies with eGovernment and consolidate the experience achieved so far with the INSPIRE implementation.

Some location datasets are available free of charge under an open licence without restrictions, while some others are available under an open licence with minimum restrictions ([Recommendation 2](#)). Core location datasets accessible with no restrictions are:

- addresses²⁰;
- administrative units²¹;
- hydrography²²;
- land use²³;
- water quality²⁴.

Core location datasets accessible with minimum restrictions are:

- air quality²⁵;
- buildings²⁶;
- cadastral parcels²⁷;
- elevation²⁸;
- geographical names²⁹;
- land cover³⁰;
- protected sites³¹;
- transport networks³²;
- other (INSPIRE priority datasets)³³.

The Slovak location datasets are available for download from the European Commission INSPIRE Geoportal³⁴.

²⁰ https://inspire-geoportal.ec.europa.eu/download_details.html?view=downloadDetails&resourceId=%2FINSPIRE-da77b119-9d6e-11e7-b5a7-52540023a883_20211126-180400%2Fservices%2F1%2FPullResults%2F141-160%2Fdatasets%2F5&expandedSection=metadata

²¹ https://inspire-geoportal.ec.europa.eu/download_details.html?view=downloadDetails&resourceId=%2FINSPIRE-da77b119-9d6e-11e7-b5a7-52540023a883_20211126-180400%2Fservices%2F1%2FPullResults%2F201-220%2Fdatasets%2F20&expandedSection=metadata

²² <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&theme=hy>

²³ <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&theme=lu>

²⁴ <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&envDomain=water>

²⁵ <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&legislation=none&envDomain=air-quality-data>

²⁶ https://inspire-geoportal.ec.europa.eu/download_details.html?view=downloadDetails&resourceId=%2FINSPIRE-da77b119-9d6e-11e7-b5a7-52540023a883_20211126-180400%2Fservices%2F1%2FPullResults%2F221-240%2Fdatasets%2F1&expandedSection=metadata

²⁷ <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&theme=cp>

²⁸ https://inspire-geoportal.ec.europa.eu/download_details.html?view=downloadDetails&resourceId=%2FINSPIRE-da77b119-9d6e-11e7-b5a7-52540023a883_20211126-180400%2Fservices%2F1%2FPullResults%2F221-240%2Fdatasets%2F2&expandedSection=metadata

²⁹ https://inspire-geoportal.ec.europa.eu/download_details.html?view=downloadDetails&resourceId=%2FINSPIRE-da77b119-9d6e-11e7-b5a7-52540023a883_20211126-180400%2Fservices%2F1%2FPullResults%2F221-240%2Fdatasets%2F3&expandedSection=metadata

³⁰ https://inspire-geoportal.ec.europa.eu/download_details.html?view=downloadDetails&resourceId=%2FINSPIRE-da77b119-9d6e-11e7-b5a7-52540023a883_20211126-180400%2Fservices%2F1%2FPullResults%2F221-240%2Fdatasets%2F3&expandedSection=metadata

³¹ <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&theme=lc>

³² <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&theme=ps>

³³ <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&theme=tn>

³⁴ <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&legislation=all>

³⁴ <https://inspire-geoportal.ec.europa.eu/results.html?country=sk&view=details&theme=none>

Where the datasets are available with charges and/or under a licence including restrictions, the most common restrictions applied to the access of high value dataset are:

- charges for commercial use, or in some cases for any use;
- charges depending on the volumes of data or types of access.

Some location reference datasets (i.e. addresses and cadastral parcels) have been made available as part of a broader core reference data policy. This follows the national principle "*once and for all*"³⁵, which underpins the digitalisation of public administration. The aim is to achieve a situation where public authorities, when providing their services, remove the obligations of citizens or business entities to submit data in the form of various extracts, declarations, certificates, etc. already held by the public administration within their registers. In order to achieve the goal, it is necessary to go through the following steps:

- improvement of data quality in source registers (elimination of errors and inconsistencies in data formats according to the relevant methodology for data quality in public administration);
- reporting of reference data (the data must be unique to the entity of the register and this data must be subject to a presumption of accuracy according to specific regulations);
- connecting providers and consumers to the central data integration platform (a module for electronic data processing and integration must be used for the exchange of data with and within public administrations);
- changes in legislation and processes in public administration (legislative obligations to submit extracts and confirmations to public administrations must be removed, and life-related processes and interactions with the citizens / business entities must be automated).

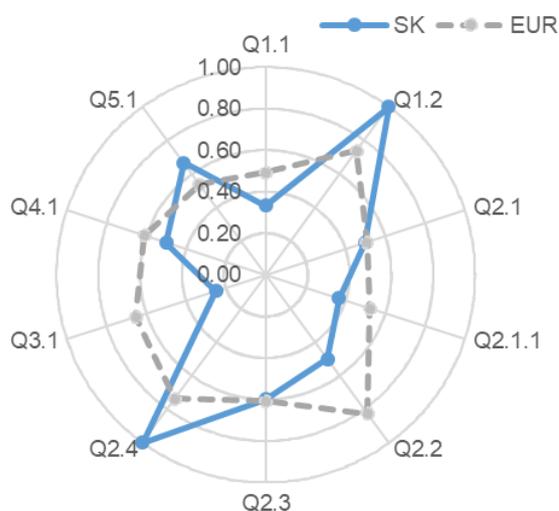


Figure 7 - Policy and Strategy Alignment - scores by indicator

Many location datasets are becoming available under the Creative Commons licensing framework, while some others are still shared through different licensing arrangements from different data providers. Efforts have been made to set up a common licensing framework under the INSPIRE sharing agreements via the INSPIRE thematic subgroup for data and service use, resulting in a preparation of national templates and examples of data sharing agreements, but the actual use thereof has been very limited. The future Data act is expected to address a common licensing framework including location related aspects.

Up to now, the country shows significant gaps in preparation for the full implementation of GDPR from a geospatial perspective, even if the Protection of Personal Data Act that implements the GDPR was adopted by the Slovak Parliament at the end of 2017 and entered into force on 25 May 2018 ([Recommendation 3](#)). The COVID-19 outbreak stressed this issue, as many complaints have been raised after a map³⁶ with data on patients tested positive for the virus began to circulate on the internet. The map also recorded data such as the patient's age, gender, date of testing or the street on which he/she resides, although without the precise numeric identification of his/her residence. In order to improve the situation, the MoE is planning to prepare relevant

³⁵ <https://datalab.digital/referencne-udaje/>

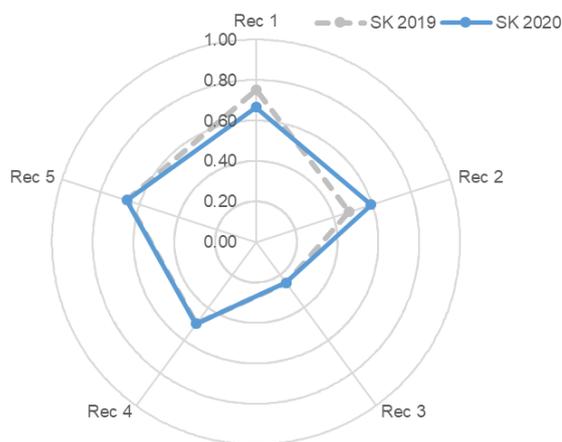
³⁶ [Zverejnili dáta o chorých, obsahujú aj názvy ulíc, vek či pohlavie - SME](#)

guidance for both location data producers and users. Similarly, the MIRRI is planning to prepare guidance addressing the eGovernment perspective. Where possible, necessary synergies between the two initiatives will be ensured.

Location-based evidence and analysis is used to help in developing and monitoring some relevant policy topics ([Recommendation 4](#)). For example, the Institute of Environmental Policy (IEP)³⁷, thanks to satellite images, has studied the large expansion of monocultural fields that compromise the agricultural landscape and reduce the value of the ecosystem services provided. According to satellite images, the average size of monoculture fields in Slovakia is around 12 hectares, the largest of all EU countries. The low diversity of crops is also a problem. A change in the approach of the common agricultural policy could lead to the promotion of green elements in the agricultural landscape, reduction of the area of monocultural fields, and cultivation in a checkerboard pattern for the diversification of cultivated crops.

The procurement of location data and services ([Recommendation 5](#)) is a point of strength for Slovakia. Specific reference to the applicable parts of the INSPIRE Directive and/or the national standards framework is made in related procurements³⁸; however, the European Single Procurement Document (ESPD) is not in use.

3.2.2 2019/2020 Comparison



[Figure 8 - Policy and Strategy Alignment – 2019/2020 comparison](#)

As per [Figure 8](#), Slovakia confirmed almost all the scores obtained in 2019.

The mandate to use authoritative location datasets in digital government was already imposed by cross sector legislation, as reported in 2019; this direction is confirmed by the ongoing review of the National Spatial Data Infrastructure (NSDI) law, which is also strengthening the synergies with the wider eGovernment domain ([Recommendation 1](#)). The state of play under all other indicators has also remained the same, and the slight change compared with 2019 is only due to the change of scale of some of the indicators.

Also for [Recommendation 2](#), Slovakia maintains the replies provided last year on the alignment between location information policy and wider data policy. The slight change is due to the recalibration of the indicators used.

No changes are reported concerning the level of GDPR awareness and preparedness ([Recommendation 3](#)), the use of location-based evidence and analysis in developing relevant policies ([Recommendation 4](#)) and the reference to INSPIRE in the public sector procurement of location data and services ([Recommendation 5](#)).

³⁷ The [Inštitút environmentálnej politiky \(minzp.sk\)](#) is an independent unit of the Ministry of Environment (MoE). Its mission is to provide quality and reliable environmental analyses and forecasts for the Slovak government and the public. IEP evaluates the economic efficiency of the measures and, in cooperation with the Value for Money Unit (EPA), prepares a Review of Environmental Expenditure.

³⁸ [Vyhľadávanie zákaziek - Úrad pre verejné obstarávanie \(gov.sk\)](#)

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.
Recommendation 6	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
Recommendation 7	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
Recommendation 8	Adopt an open and collaborative methodology to design and improve location-enabled digital public services
Recommendation 9	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

3.3.1 2020 Results

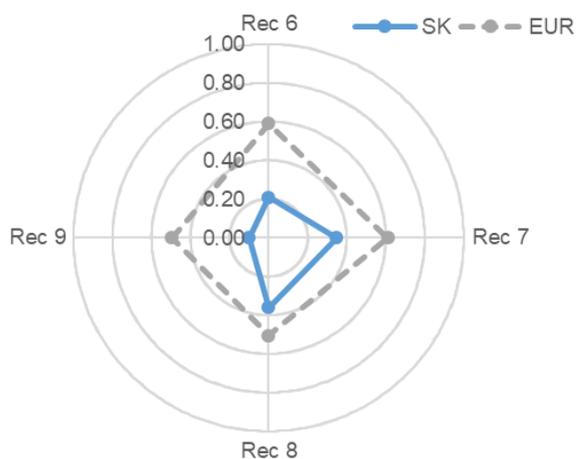


Figure 9 - Digital Government Integration - scores by recommendation

The scores for each recommendation in the "Digital Government Integration" 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 with the European averages.

The "Digital Government Integration" focus area index for Slovakia is 0.25, significantly below the European average of 0.57. This is mainly due to the low scores in [Recommendation 6](#), [Recommendation 9](#) and [Recommendation 7](#). Better scores have been obtained under [Recommendation 8](#), whose index is not far from the average.

Opportunities for improving digital public services and processes through the use of location information are exploited only to a limited extent, even if some steps have been taken in that direction ([Recommendation 6](#)). The use of location information is still between the sub-optimal (disaster management and civil protection, regional and urban development, tourism and culture) and basic level (environment, property and land administration, transport). In these sectors there are however use cases of location information with some interesting developments:

- disaster management and civil protection: monitoring of floods in the country through the Copernicus Emergency Management Service (EMS)³⁹;
- environment: the Institute for Environmental Policy has conducted a study on national parks⁴⁰ in eleven countries; the information collected shows that in most of the countries

³⁹ <https://emergency.copernicus.eu/mapping/list-of-components/EMSR471>; <https://www.facebook.com/inspiresk/posts/157973659329409> (can be accessed only when logged in to Facebook)

⁴⁰ <https://www.minzp.sk/iep/publikacie/komentare/ako-funguju-narodne-parky-eu.html>

studied, there is a trade-off between nature conservation on one side and tourism and development of the regions on the other; however, the smallest divergences were recorded in countries with a high share of state land and with a unified management of national parks. This study may foster more proactive, evidence-based management of the environment consistently with potential tourist flows;

- property and land administration⁴¹: the objective of the Central Property Records (CPR) is to provide an overview of fixed property assets owned by the Slovak Republic and used for welfare and non-business purposes. The CPR enables users to search for residential buildings, non-residential buildings, flats, non-residential premises and land according to various criteria; the search result is displayed in tabular form or by location of properties on a map; by selecting an individual property, a detailed menu containing relevant information is displayed;
- regional and urban development: since 2017, the Department of the Chief Architect of Bratislava has collaborated with experts from the Faculty of Natural Sciences of Comenius University and partner cities of Paris, Bilbao and Manchester, as well as with the Fraunhofer Institut on the European project Climate Resilient Cities and Infrastructures (RESIN). The aim has been to create a methodology for assessing the vulnerability of the city to the consequences of climate change. The Climate Atlas⁴² is a follow-up activity of the Chief Architect Department, established in close cooperation with the Bratislava Water Company, the National Centre of Health Information of the Slovak Republic, the Slovak Hydro meteorological Institute, the Bratislava Self-Governing Region and the professional units of the Capital City Municipality. The Climate Atlas with connected data and assessments will be available to the general public via the capital's website and its open data portal;
- transport⁴³: the traffic information portal⁴⁴ provides overall information about all traffic related services and the current traffic situation in Slovakia. Users and traffic experts are informed about the general traffic situation, traffic restrictions, traffic accidents and current road conditions. The contributors can report traffic events directly in the portal. All reported traffic events are processed by the Národné Dopravné Informačné Centrum (NDIC - National transport information centre), which is part of the NSDI and collects, processes, evaluates and verifies transport events and data 24/7.

There is also room for improvement in the use of SDI and INSPIRE conformant datasets in delivering digital public services ([Recommendation 7](#)). The SDI is used in delivering digital public services across government only in some cases; INSPIRE conformant datasets and services are not used or used in to a very little extent.

Different SDI approaches are used for the delivery of key digital public services in the sectors where location information plays an important role:

- sector SDI in the environment sector: the MoE, in cooperation with the Slovak Environment Agency and the Slovak Hydrometeorological Institute, has launched the web application “/ *breathe*”⁴⁵ with the aim of raising public awareness in the field of air quality in Slovakia. The application is developed within the LIFE IP SK – Air Quality Improvement project, which focuses on the implementation of specific air quality improvement measures and on support to the educational, communication and monitoring activities of involved partners with regard to air quality and protection, through the creation of a national network of Air Quality Managers;

⁴¹ <https://www.majetokstatu.sk/en>

⁴² [Bratislava | V klimatickom atlase Bratislavy je zhodnotená zraniteľnosť mesta na dôsledky klimatickej krízy](#)

⁴³ <https://odoprave.info/wps/portal/pub/Home/o-portali/casto-kladene-otazky/>

⁴⁴ <https://odoprave.info>

⁴⁵ <https://dnesdycham.populair.sk/>

- national SDI in the health sector, for example for COVID-19 monitoring⁴⁶;
- application specific spatial data in the regional and urban development sector: in September 2019 the Implementation Unit of Bratislava Municipality released the emotional map of Bratislava⁴⁷ which is a collection of citizens' opinions on public spaces in the city.

Slovakia is involved in delivering some cross-border digital public services using the country's spatial data infrastructure (SDI). INSPIRE conformant datasets and services are not used for this purpose.

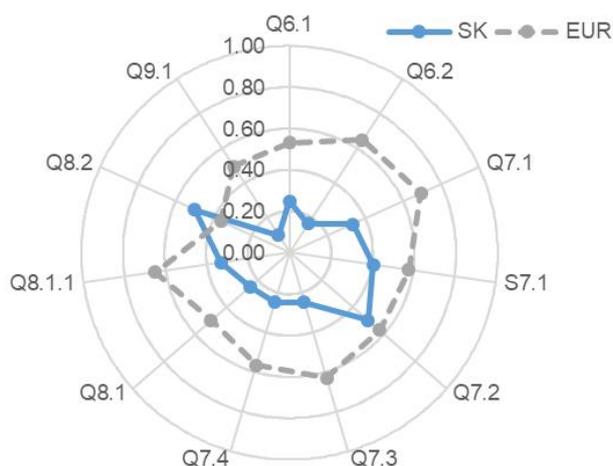


Figure 10 - Digital Government Integration - scores by indicator

The public sector SDI is only occasionally used by the private sector and other non-governmental organisations for delivery new and innovative applications, products and services. An example is “Climathon⁴⁸”, a city-based programme developed in cooperation with NGOs that offers an opportunity for local administrations and citizens to co-create local ideas to shared climate challenges. At the core of the Climathon programme is a yearly ideathon that takes place in a selected city in the country and in hundreds of other cities across many continents and time-zones. Over the span of a 12 to 72 hour ideathon, a diverse group of participants, ranging from policymakers to hackers, young

people to academics, students to business leaders, come together to collaborate on forward-thinking ideas that tackle local climate challenges.

Another example of use of public sector SDI in the private sector is Albert⁴⁹, a tool developed by a company operating in the GIS domain to effectively assess the risks associated with a specific area or property over time and space. Based on a detailed analysis, Albert will uncover the natural and anthropogenic hazards that can cause significant damage not only to infrastructure but also to human lives.

The implementation maturity of the INSPIRE Directive is below the European average, as calculated from the indicators of the INSPIRE country fiche. The fiche reports quite a low conformity of spatial data sets, as well as low accessibility of spatial data sets through view and download services and low conformity of the network services.

A positive note is the involvement of external parties in the delivery of location-based public services in a variety of ways ([Recommendation 8](#)), by which public authorities:

- subcontract to the private sector under public control;
- collect location data through an established process or service and make the data openly available for external parties to develop their own products and services;
- encourage ‘civic hacking’ to develop new ideas, technologies or methodologies to help solve civic problems and improve the lives of citizens.

⁴⁶ <https://geopresovregion.sk/mviewer/?lang=sk&config=apps/covid-sk.xml> and <https://korona.gov.sk/covid-automat-na-slovensku/>

⁴⁷ <https://opendata.bratislava.sk/dataset/show/pocitova-mapa-bratislavy>

⁴⁸ <https://climathon.climate-kic.org/bratislava>

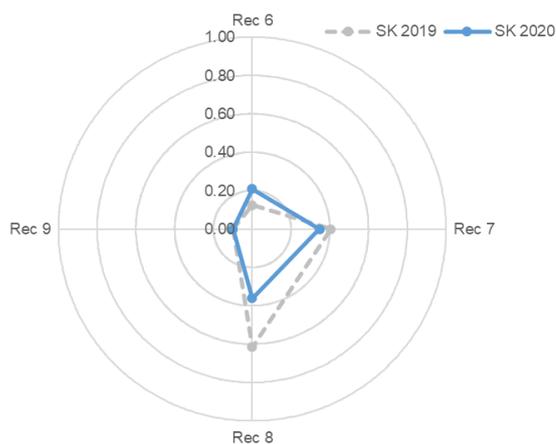
⁴⁹ <https://albert.plus>

An open and collaborative methodology to design and improve location enabled digital public services is however applied only in limited cases at national level.

Integration of location and statistical information in the production of location-based statistics relies on a limited set of actions ([Recommendation 9](#)):

- collection of census data based on the location reference framework for statistics;
- efforts made to increase the involvement of Statistical Office of the Slovak Republic in the implementation of INSPIRE in the statistical domain, although with no significant progress yet to report.

3.3.2 2019/2020 Comparison



[Figure 11 - Digital Government Integration - 2019/2020 comparison](#)

Compared to the previous year, as shown in [Figure 11](#), the scores obtained under all recommendations have been quite close to those of 2019, except for [Recommendation 8](#), where a strong regression has been reported, and [Recommendation 6](#), where there has been a certain improvement.

The index for [Recommendation 8](#) has been affected by the changes made to two indicators out of three. The resulting assessment aims to represent the current maturity in a more realistic way, and anyway there has been no decline in the use of an open and collaborative methodology to design and improve

location-enabled digital public services.

The improvement in [Recommendation 6](#) is connected with the additional reported cases of at least basic use of location information in digital public services.

Slovakia has confirmed the same level of use of the SDI in cross-government services, of involvement in cross border digital public services using the SDI and of exploitation of the public sector SDI by the private sector for the delivery of new and innovative applications, products, and services ([Recommendation 7](#)) The differences in the scores are due to the changes in various indicators.

Finally, no development has been reported concerning the integration of location and statistical information in the production of location-based statistics, which remains quite limited ([Recommendation 9](#)).

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 ISA ² 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.
Recommendation 10	Adopt a common architecture to develop digital government solutions, facilitating the integration of geospatial requirements
Recommendation 11	Reuse existing authentic data, data services and relevant technical solutions where possible
Recommendation 12	Apply relevant standards to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in digital public services
Recommendation 13	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

3.4.1 2020 Results



Figure 12 - Standardisation and Reuse - scores by recommendation

The scores for each recommendation in the “Standardisation and Reuse” focus area are shown in [Figure 12](#) and the underlying indicator scores for each recommendation are shown in [Figure 13](#) - Standardisation and Reuse - scores by indicator. In both cases, the country scores are compared with the European averages.

The “Standardisation and Reuse” focus area index for Slovakia is 0.53, compared with a European average of 0.55. In this focus area, Slovakia stands out for its performance under [Recommendation 11](#), on the reuse of authentic data and services, while the other recommendations have scored below the European averages.

There is a policy for a common location architecture⁵⁰, but it is not yet widely adopted ([Recommendation 10](#)). An ad-hoc approach is applied to monitoring new technology developments, with very little testing involved.

A series of location data application programming interfaces (APIs) has been developed, documented and made accessible. An example of an open API interface is the OpenData Bratislava portal⁵¹. The aim of this website is to enable application developers to access data through the portal. Tests have started on the possible deployment of the OGC API – features standard with data from the Address registry.

The adoption of APIs is fostered through several actions:

⁵⁰ The Act No. 215/1995 coll. on Geodesy and Cartography and later amendments

⁵¹ <https://opendata.bratislava.sk/page/openapi>

- user communities are consulted in development / enhancement of APIs;
- APIs are discoverable in both public sector catalogues/portals and external catalogues (alongside non-public sector APIs);
- APIs have published service level agreements which support required use (e.g. availability, data quality, timeliness, response times).

The National Search Service of the Spatial Data Registry (RPI)⁵² is in the process of rebuilding its API, providing the possibility for machine processing of the contents of the Registry. The RPI currently provides two standardised APIs:

- a web catalogue service⁵³ built according to the OGC CSW 2.0.2 Catalogue Service for Web standard, which provides query functions for searching metadata based on search criteria for INSPIRE requests and returns a structured XML document in response; the service is in accordance with the INSPIRE implementing legislation and with a relevant amendment to the Národnej infraštruktúry pre priestorové informácie (NIPI – National Infrastructure for Spatial Information) Act;
- a service⁵⁴ providing GeoDCAT-AP support for eGovernment and Open Data RPI requests.

The main strength under [Recommendation 11](#), is linked to the large number of implemented registers of location information:

- addresses⁵⁵;
- geographical names⁵⁶;
- administrative units⁵⁷;
- cadastral parcels⁵⁸;
- code lists⁵⁹;
- glossary⁶⁰;
- buildings⁶¹;
- hydrography⁶²
- transport networks⁶³.

Several ISA² solutions (e.g. Re3gistry, GeoDCAT-AP, INSPIRE reference validator, EULF Blueprint, CIRCABC) have been implemented and reused in the SDI.

Different types of geospatial standards are used to develop a comprehensive approach for spatial data modelling, sharing, and exchange to facilitate integration in digital public services ([Recommendation 12](#)):

- international standards;
- adaptations of international standards (e.g. INSPIRE):
- stand-alone domestic standards: these are based on national legal acts and profile implementing standards, namely:

⁵² <https://rpi.gov.sk/en>

⁵³ [https://rpi.gov.sk/rpi_csw/service.svc/get?;](https://rpi.gov.sk/rpi_csw/service.svc/get?)

⁵⁴ An example of query made through this service is https://rpi.gov.sk/rpi_csw/service.svc/get?request=getrecordbyid&service=csw&version=2.0.2&outputSchema=http://www.w3.org/ns/dcat&resulttype=results&elementsetname=full&id=https://data.gov.sk/set/rpi/gmd/00626031/170123074833

⁵⁵ <https://www.slovensko.sk/sk/agendy/agenda/register-adries/>

⁵⁶ <https://www.geoportal.sk/sk/udaje/udaje-zbgis/geograficke-nazvoslovie/>

⁵⁷ https://www.geoportal.sk/sk/zbgis_smd/na-stiahnutie/

⁵⁸ <https://kataster.skgeodesy.sk/eskn-portal/>

⁵⁹ <http://registre.enviroportal.sk/geo>

⁶⁰ <http://www.skgeodesy.sk/sk/terminologicky-slovník/>

⁶¹ <https://www.geoportal.sk/sk/inspire/zobrazovacie-sluzby/> for view services, <https://www.geoportal.sk/sk/inspire/ukladacie-sluzby/> for download services

⁶² Same links for view and download services as per note [22](#).

⁶³ Same links for view and download services as per note [32](#).

- Decree 78/2020 of the Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatisation, on Standards for Public Administration Information Technology⁶⁴;
- Slovakian INSPIRE MD profile (v.2.0), currently under consultation⁶⁵.

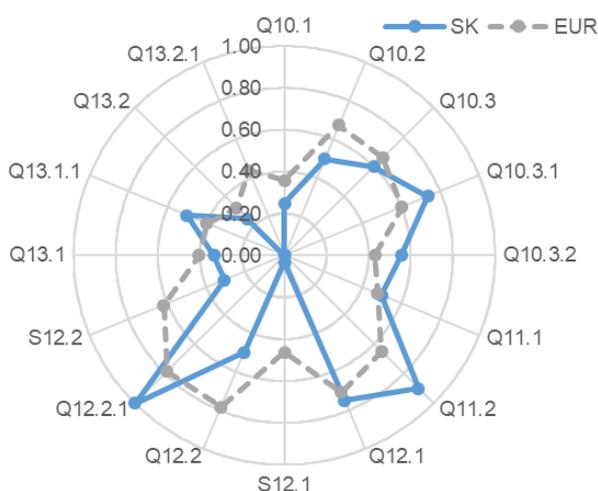


Figure 13 - Standardisation and Reuse - scores by indicator

There is no standardised approach to facilitate discoverability of spatial and non-spatial data through joint access mechanisms, as different metadata specifications and tools are used for each sector and case. The specifications mostly used to share metadata in an interoperable way and combine spatial with non-spatial metadata are OGC CSW 2.0 and GeoDCAT-AP⁶⁶. There is a plan to integrate the Spatial Data Registry with the National open data portal via standardised metadata exchange. Additionally, a project on linked open data and semantic interoperability aims to enhance data interoperability and discoverability through semantic interoperability⁶⁷.

Slovakia is below the European average for both conformity of spatial datasets and conformity of the network services to INSPIRE implementing regulations.

Location data quality is ensured at design level ([Recommendation 13](#)) through:

- the development and application of a framework for the analysis of data quality;
- linking data quality standards to data standards;
- the consideration of the different dimensions of data quality in the standard, such as: timeliness, accuracy, completeness, integrity, consistency, compliance to specifications / standards / legislation.

The most applied quality standard is ISO 19157 - Geographic information — Data quality. Additionally, the Slovak DataLab provides a framework to describe data quality as a set of characters such as accuracy, trustworthiness, integrity, availability or reliability. Data quality awareness is still quite low, although some data quality aspects are monitored via metadata by the Geodesy, Cartography and Cadastre Authority of the Slovak Republic and other initiatives in the same direction are planned by the Ministry of Environment of the Slovak Republic. Data quality governance is pursued through the:

- alignment of data quality improvement roadmap with the general information governance vision and strategy;
- alignment with the eGovernment data quality activities implemented by the Data Office of the MIRRI⁶⁸.

⁶⁴ <https://www.slov-lex.sk/pravne-predpisy/SK/ZZ/2020/78/20200501>

⁶⁵ <http://inspire.gov.sk/clanky/konzultacia-k-skmetadajovmu-profilu-2-0>

⁶⁶ <https://rpi.gov.sk/sk/sluzby-metaudajov/narodna-vyhľadavacia-sluzba>

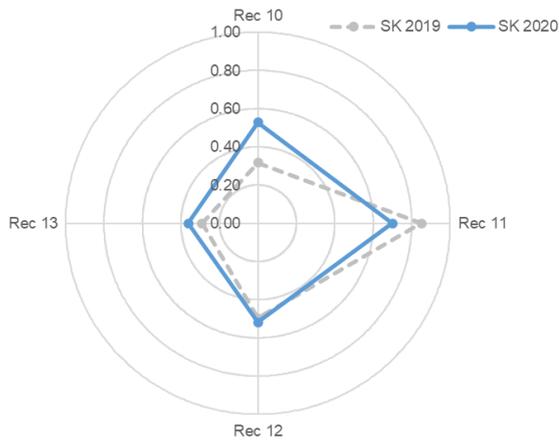
⁶⁷ See best practice [SK3](#)

⁶⁸ <https://datalab.digital/dq/>

3.4.2 2019/2020 Comparison

Compared to the previous year, as shown in [Figure 14](#), there has been a significant improvement only in [Recommendation 10](#): in 2020 a series of location data APIs has been developed, documented and made accessible for SDI / INSPIRE datasets, a development that was reported as being in the testing phase in 2019.

The decrease under [Recommendation 11](#) is due to the new or modified indicators under this recommendation. The reuse status of generic ICT solutions and registers of location information has actually remained the same in 2020 as in 2019.



[Figure 14 - Standardisation and Reuse - 2019/2020 comparison](#)

Under [Recommendation 12](#), a slight decrease in the two INSPIRE monitoring indicators on the percentage of conformant datasets and network services (due to the availability of more non-INSPIRE datasets and services in the NSDI) has been offset by the positive effect of the new indicators on the use of standardised metadata for joint discoverability of spatial and non-spatial datasets.

The location data quality approach and governance has not substantially changed ([Recommendation 13](#)).

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.
Recommendation 14	Apply a consistent and systematic approach to monitoring the performance of location-based services
Recommendation 15	Communicate the benefits of integrating and using location information in digital public services
Recommendation 16	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

3.5.1 2020 Results

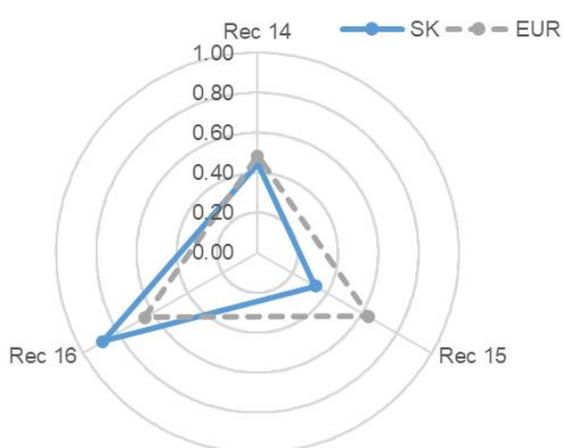


Figure 15 - Return on Investment - scores by recommendation

14 is aligned with the average. On the other hand, [Recommendation 15](#) is below the European average, mostly because of the gaps in terms of communication on the benefits of integrating and using location information in digital public services.

Availability and reliability are evaluated for some location-based services, but a comprehensive methodology to assess the efficiency and effectiveness of location-based services is missing ([Recommendation 14](#)). A dashboard for monitoring the web map services is currently under development⁶⁹. Monitoring is done at the level of single projects, of organisations and of the SDI. INSPIRE monitoring and reporting is a relevant component of this monitoring approach. Its main objective is to provide mechanisms to identify the state of implementation of INSPIRE/NIPI for the purposes of both the European Commission and the Slovak Republic.⁷⁰ In addition to the INSPIRE monitoring mechanism, the country exploits other monitoring

⁶⁹ <https://monit.geocloud.sk/ghc/>

⁷⁰ <http://inspire.gov.sk/implementacia/monitoring-a-reporting>

frameworks that take into consideration location aspects (e.g. DESI⁷¹, Global Open Data Index⁷², OECD Open Government Data Report⁷³, Open Data Barometer⁷⁴, Open Data Inventory⁷⁵, Open Data Maturity In Europe⁷⁶).

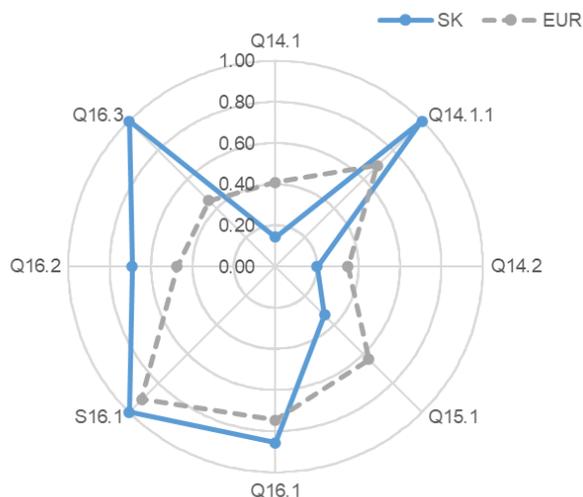


Figure 16 - Return on Investment - scores by indicator

Impact-based improvements in location-enabled processes and services rely only on the identification and monitoring of the benefits of location information, and do not exploit the monitoring information to direct investments in location-enabled services; data on production, dissemination and use of location data and services are not regularly monitored.

As mentioned above, only some basic communication initiatives have been adopted to convey the benefits of integrating and using location information in digital public services ([Recommendation 15](#)). A survey on the topic of user requirements for better location-related websites⁷⁷ has been part of the

engagement approach to simplify and improve information communication in this area. A Facebook page provides all relevant INSPIRE-related news⁷⁸.

[Recommendation 16](#) is the point of strength of Slovakia in this focus area. The country has implemented a considerable array of 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. These include:

- a national open data portal⁷⁹ merging location data and non-location data;
- a national discovery⁸⁰ geoportal integrating INSPIRE and non-INSPIRE data;
- the geoportal being harvested by the European Data Portal;
- thematic portals complementing general search facilities with “specialist” search;
- websites with exposition of data;
- plans to support availability of spatial data sets on web search engines.

Cross domain / portals discovery still needs to be implemented.

Slovakia has also implemented a considerable number of actions to actively support private, non-profit and academic actors in the development of new products, services or research using public sector location data:

- an open data policy;

⁷¹ <https://ec.europa.eu/digital-single-market/en/countries-performance-digitisation>

⁷² <https://index.okfn.org/place/>

⁷³ https://opendatabarometer.org/data-explorer/?_year=2015&indicator=ODB

⁷⁴ https://opendatabarometer.org/data-explorer/?_year=2015&indicator=ODB

⁷⁵ <https://odin.opendatawatch.com/report/rankings>

⁷⁶ <https://www.europeandataportal.eu/en/dashboard/2020>

⁷⁷ <https://inspire.gov.sk/clanky/prieskum-uvateskch-poiadaviek-pre-lepie-weby-a-komunikaciu-v-oblasti-nipi-inspire>

⁷⁸ <https://www.facebook.com/inspiresk/> (can be accessed only when logged in to Facebook)

⁷⁹ <https://data.gov.sk/>

⁸⁰ <https://rpi.gov.sk/sk>

- promoting access to open data through hackathons⁸¹: the Tatra hackathon was held in the Poprad IT incubator under the auspices of the Ministry of Transport and Construction of the Slovak Republic, with the participation of individuals or teams of programmers enthusiastic for technologies and innovations in the transport, logistics and tourism domains. The winning project ("Road Quality Tracker") contributes to monitoring of road quality and traffic through a mobile application visualising pertinent information on a map;
- 'Innovation labs' or 'Innovation hubs';
- including non-government actors in the governance framework for public sector data;
- 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 the further development of INSPIRE/SDI:
 - survey of user requirements for better websites and communication in the field of INSPIRE/SDI;
 - consultations relating to the INSPIRE MIWP Work programme 2020-2024;
 - consultations on the European data strategy;
 - survey on INSPIRE implementation and requests for project support;
 - high value datasets consultation.
- 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.

There is a strategic approach to funding public sector location reference data to make access at point of use cost effective. The MIRRI has launched a certain number of calls for funding of location reference data, particularly the support for data management⁸², better eGovernment services⁸³ as well as information and cyber security⁸⁴. The National mapping authority launched the procurement of a new Digital terrain relief model (DTM 5.0), with the aim of effectively using public funds. The EU funded ESPUS⁸⁵ project coordinated by the Ministry of Environment aims to effectively use public sector funds in order to improve the functioning of public administration through the efficient access and use of spatial data and services, by creating synergies between the geospatial domain and eGovernment.

The reuse of public sector information within public administration is promoted by appropriate policies.

⁸¹ <https://ttrahack.sk/> and <https://climathon.climate-kic.org/bratislava>

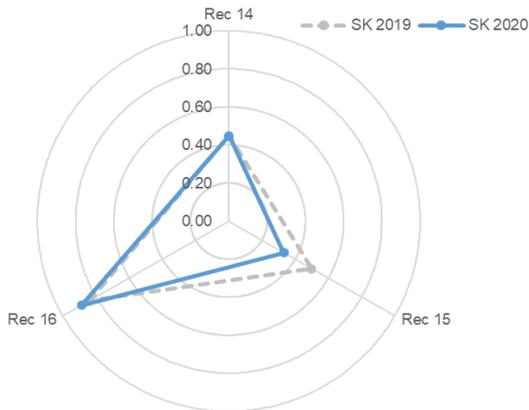
⁸² <https://www.mirri.gov.sk/projekty/projekty-esif/operacny-program-integrovana-infrastruktura/prioritna-os-7-informacna-spolocnost/vyzvania-a-vyzvy/vyzva-c-opii-2021-7-15-dop/>

⁸³ <https://www.mirri.gov.sk/projekty/projekty-esif/operacny-program-integrovana-infrastruktura/prioritna-os-7-informacna-spolocnost/vyzvania-a-vyzvy/vyzva-c-opii-2021-7-14-dop/>

⁸⁴ <https://www.mirri.gov.sk/projekty/projekty-esif/operacny-program-integrovana-infrastruktura/prioritna-os-7-informacna-spolocnost/vyzvania-a-vyzvy/vyzva-c-opii-2021-7-16/>

⁸⁵ See best practice [SK4](#)

3.5.2 2019/2020 Comparison



[Figure 17 - Return on Investment - 2019/2020 comparison](#)

of location data and location-enabled digital public services was being considered. In 2020, some basic communication has been delivered, but the indicator now gives greater emphasis to the quality and frequency of the communication, which still has relevant margins for improvement.

Lastly, the country has confirmed the practices reported in 2019 to facilitate searching, finding and accessing location data, to support private, non-profit and academic actors in the development of new products and to fund public sector location reference data initiatives.

Compared to 2019, Slovakia has obtained similar scores in [Recommendation 14](#) and [Recommendation 16](#) and lower ones in [Recommendation 15](#), as shown in [Figure 17](#).

Monitoring and impact-based improvement practices ([Recommendation 14](#)) have been confirmed as in 2019.

The lower score under [Recommendation 15](#) is due to a change in the scale of the main indicator. In 2019, the country replied that a systematic approach to communication of availability and benefits

3.6. Governance, Partnerships and Capabilities

Vision	
	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.
Recommendation 17	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
Recommendation 18	Partner effectively to ensure the successful development and exploitation of Spatial Data Infrastructures
Recommendation 19	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

3.6.1 2020 Results

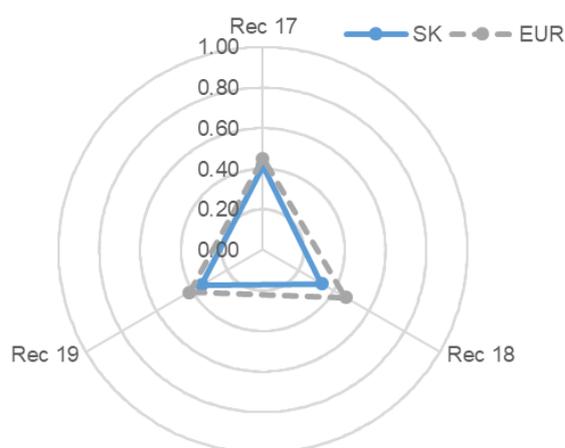


Figure 18 – Governance, Partnerships and Capabilities – scores by recommendation

Scores for each recommendation in the "Governance, Partnerships and Capabilities" focus area are shown in [Figure 18](#) and the underlying indicator scores for each recommendation are shown in [Figure 19](#). In both cases, the country scores are compared with the European averages.

The "Governance, Partnerships and Capabilities" focus area index for Slovakia is 0.37, compared with the European average of 0.45.

Different communities, domains, administrative levels and sectors participate in decision making on the role of location information in digital government but not all

relevant stakeholders are involved ([Recommendation 17](#)). There is participation through working groups on eGovernment and INSPIRE and by sharing consultations and information through conferences, workshops or hackathons.

There is some joint leadership and coordination on actions and policies related to the role of the SDI in Digital Government. For instance, the ministries respectively responsible for eGovernment (MIRRI) and INSPIRE (MoE) exchange and discuss relevant information. As part of this dialogue, ad hoc meetings have been organised focused on specific topics of common interest (e.g. GDPR, unique persistent identifiers, open data, high value data, etc.).

Only a small number of partnership agreements are in place to develop, fund or operate location-enabled services between public authorities ([Recommendation 18](#)). Examples are the interministerial agreements (among MIRRI, MoE and Ministry of Interior) related to the funding

to support location data related projects. Public-private partnerships have mainly been established in the following areas:

- all geodetic surveys for a creation of survey sketches for the purposes of the Geodesy, Cartography and Cadastre Authority;
- Land Title Consolidation (ROEP) for the same Authority;
- Land Consolidation Project for the Authority and for the Ministry of Agriculture;
- aerial photos for establishing payments for support to farmers under the Integrated Administration and Control System – IACS by the Ministry of Agriculture.

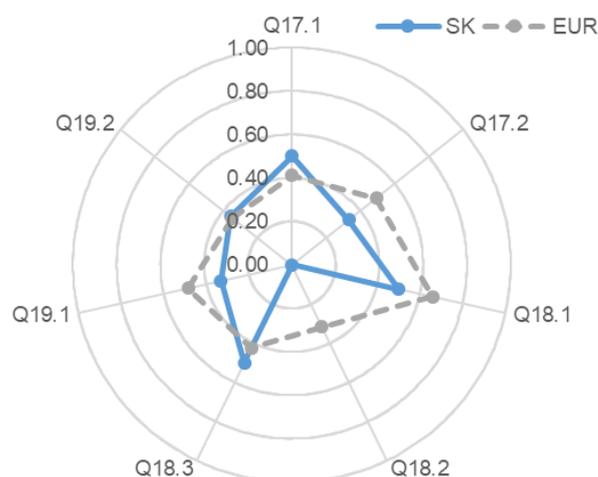


Figure 19 - Governance, Partnerships and Capabilities - scores by indicator

Overall, the involvement of private, non-governmental research and development players in the development of location-enabled public services is however still quite limited.

Several initiatives have been organised to ensure sufficient awareness and capabilities to drive through improvements in the use of location information in digital public services and support growth opportunities ([Recommendation 19](#)):

- training for specialists, e.g. developers, data analysts;
- special interest groups for knowledge sharing within the geospatial community;
- public or cross-government events specialising in location information / GI topics;
- INSPIRE training modules
- community awareness raising initiatives (e.g. GISkola⁸⁶, GIS days⁸⁷, or Panel discussions⁸⁸).

3.6.2 2019/2020 Comparison

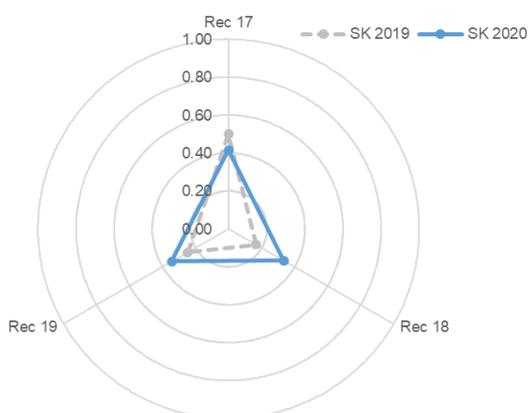


Figure 20 - Governance, Partnerships and Capabilities - 2019/2020 comparison

As already described in the [Overview](#), and shown in [Figure 20](#), this is the focus area where Slovakia has improved its positioning the most, thanks to the additional information gathered on the availability of public-private partnerships.

Stakeholders from relevant communities (location and digital government), domains (thematic), administrative levels (central and local) and sectors (public, private, academic, society) have been involved in decision making on the SDI to the same extent as in 2019 ([Recommendation 17](#)).

⁸⁶ <https://amavet962.org/giskola/>

⁸⁷ <https://amavet962.org/gisday/>

⁸⁸ https://www.facebook.com/watch/live/?ref=watch_permalink&v=293321298994798

The slight decrease of the score is due to the recalibration of one indicator.

The highest increase has been reported under [Recommendation 18](#), where information collected in 2020 has confirmed the existence of a certain number of public-private partnerships in the geospatial domain, which were not reported in 2019. The other partnership practices (between public authorities within the country and cross-border) have been confirmed.

The country also confirmed the approach to foster skills and training for innovative geospatial solutions and the width of initiatives organised to raise awareness and develop geospatial skills ([Recommendation 19](#)). The progress registered from 2019 is also due to the recalibration of one indicator.

4. Best practices

Best Practice SK1	Geopresovregion.sk
Policy domain: Broad set of policy domains	
Process owners: Prešov Self-governing Region	
Short description: The Geo-Infrastructure Platform of the Prešov Region was created as part of the Catching-up Regions initiative with support of the European Commission, the World Bank and the Office of the Deputy Prime Minister for Investment and Informatisation. The Prešov Self-governing Region in cooperation with University of Prešov are participating in activities towards the creation of a regional spatial information infrastructure. The solution is based on building a comprehensive database of high-quality and up-to-date open data. The aim of the platform is to bring high-quality knowledge of the region, effective information exchange among institutions, and a simple view on important information to the public, municipalities, academia or the private sector.	
Recommendations: Return on Investment (16)	
Link: https://geopresovregion.sk/geonetwork/srv/en/catalog.search#/georchestra	
Best Practice SK2	Czech and Slovak INSPIRE conference – Inspirujme se
Policy domain: Geospatial	
Process owners: Czech Environmental and Information Agency, Slovak MoE	
Short description: The Joint Czech and Slovak INSPIRE conference, has a long tradition (from 2008), aiming to share experience and knowledge across the INSPIRE and geospatial community. The conference provides an opportunity to present latest achievements as well as share challenges faced by stakeholders. Each year the conference aims to address relevant topics and arrange appropriate contributions. During recent years, efforts have been made for better involvement of participants in order to ensure stronger interaction and a higher quality event. Although the majority of participants come from public sector, increasing participation can be seen from the other societal domains (e.g. private sector, academia, non-government sector).	
Recommendations: Governance Partnerships and Capabilities (18)	
Link: https://inspirujmese.cz/	
Best Practice SK3	Slovak Semantic Interoperability Framework 2021
Policy domain: Digital government / Geospatial	
Process owners: Ministry of Environment of the Slovak Republic	
Short description: The Slovak Semantic Interoperability Framework (SSIF) was initially created in 2013. Its objective is to establish semantic interoperability in all Slovak public administration systems and, additionally, to ensure data interoperability with all European countries. From 2016 a linked open government data focused community started to publish linked open data (LOD) in order to show how interoperability can be established using semantic web technologies.	
This agenda is fully supported by the Central Data Office at the Ministry of Investments, Regional Development and Informatisation of the Slovak Republic. The hardest parts of the	

activities to steer Slovak public data toward semantic interoperability are now being implemented, after tackling the initial basic issues. Several new complex public information systems are being developed or updated or will start to produce large amounts of open data. Significant effort is being put into handling requirements and questions from various public authorities to preserve the consistency and coverage of the SSIF for all their information systems.

The agreed strategy is to provide the widest possible support from the Central Data Office to all involved stakeholders to adopt and create new semantic representations of data structures in public services, information systems and open data publishing.

The initiative aims to enhance the development of public services making data consumption and analysis substantially easier, faster and more precise, and improving quality of all public data. This will ultimately improve the quality of life of all citizens.

Recommendations: [Policy and Strategy Alignment](#) (1); [Standardisation and Reuse](#) (12); [Governance, Partnerships and Capabilities](#) (18, 19)

Link:

https://op.europa.eu/documents/7525478/8087182/L%C3%8D%C5%A0KA_presentation_Slovak+Semantic+Interoperability+Framework+2021+%281%29.pdf/e575244b-993c-52a6-d0b0-755bbe3dad3?t=1616614974502

Best Practice SK4 ESPUS (Effective management of spatial data and services)

Policy domain: Geospatial skills; geospatial framework

Process owners: Ministry of Environment of the Slovak Republic

Short description: The ESPUS (Effective management of spatial data and services) project was launched in 2020 with a focus on "soft skills" support to INSPIRE implementation in synergy with eGovernment. The project aims to improve the functioning of public administration through efficient access to and use of spatial data and services. Four main areas are addressed:

- legal and methodology framework;
- support for INSPIRE harmonisation;
- use of spatial data and services;
- awareness raising and capacity / skills improvement.

Although public administrations create and use a wide range of spatial data, their sharing and reuse falls far short of their potential. The ESPUS project will make use of and improve the existing legislative framework defining the National Spatial Information Infrastructure and increase synergies with eGovernment activities to foster the availability, quality and usability of spatial data and services.

To achieve the effective availability and use of this digital spatial content and functionality, ESPUS will provide an organisational and methodological framework for effective spatial data management. Last but not least, the project will provide expert capacity support, including awareness-raising activities.

The successful implementation of the project will create the conditions for achieving a situation where, in addition to ensuring compliance with legislative requirements and technical expectations, the National Infrastructure for Spatial Information (NIPI) will provide:

- coordinated support through the NIPI Data Office.
- support for application and further development for the Methodological Framework for effective management and monitoring of spatial data and services.

- continued harmonisation of spatial data and services to achieve the required degree of interoperability;
- support for the operation and further development of the use case outputs generated by the project, including activities aimed at enhancing the reuse of available data sources;
- awareness raising of the requirements and benefits of sharing of harmonised spatial data and services.

Project progress and success is monitored through a series of measurable indicators, concerning for example the development of the aforementioned methodological framework, the preparation of proposals for legislative amendments, use cases of requirements and process analyses, and the number of training events and workshops delivered.

Recommendations: [Policy and Strategy Alignment \(1, 2\)](#); [Standardisation and Reuse \(12\)](#); [Return on Investment \(15, 16\)](#); [Governance, Partnerships and Capabilities \(18, 19\)](#)

Link: <http://inspire.gov.sk/projekty/espus>

List of abbreviations and definitions

Abbreviations

Abbreviation	Meaning
API	Application Programming Interface
CPR	Central Property Records
CSW	Catalogue Service – Web
DBGT	Geo-Topographic Data Base
DCAT-AP	Data Catalogue vocabulary – Application Profile
EIF	European Interoperability Framework
ELISE	European Location Interoperability Solutions for e-Government
EMS	Copernicus Emergency Management Service
EPA	Value for Money Unit
EULF	European Union Location Framework
GDPR	General Data Protection Regulation
GI	Geographic Information
G2B	Government to Business
G2C	Government to Citizen
G2G	Government to Government
IACS	Integrated Administration and Control System
ICT	Information and Communication Technology
IEP	Institute of Environmental Policy
INSPIRE	Infrastructure for Spatial Information in the European Community
ISA ²	Interoperability Solutions for European Public Administrations, Businesses and Citizens Programme
ISO	International Standard Organisation
LIFO	Location Interoperability Framework Observatory
MIRRI	Ministry of Investments, Regional Development and Informatisation
MoE	Ministry of Environment of the Slovak Republic
NDIC	Národné Dopravné Informačné Centrum (National Traffic Information Centre)
NGO	Non-Governmental Organisation
NIFO	National Interoperability Framework Observatory
NIPI	Národnej infraštruktúry pre priestorové informácie (National Infrastructure for Spatial Information)
NMA	National Mapping Agency
NSDI	National Spatial Data Infrastructure
OGC	Open Geospatial Consortium
RESIN	Climate Resilient Cities and Infrastructures
REST	Representational state transfer
ROEP	Register Obnovenej Evidencie Pozemkov (Register of Renewed Land Records)
RPI	Registra priestorových informácií (Spatial Data Registry)
SDI	Spatial Data Infrastructure
SSIF	Slovak Semantic Interoperability Framework
WCS	Web Coverage Service
WFS	Web Feature Service
WMS	Web Map Service

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.	Application Programming Interface Joinup (europa.eu)
Authentic data	Data that provides an accurate representation of reality with quality parameters that are fit for the intended purposes.	Authentic data Joinup (europa.eu)
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.	Authoritative data Joinup (europa.eu)
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.	High Value Dataset Joinup (europa.eu)
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.	http://ggim.un.org/meetings/GGIM-committee/documents/GGIM5/E-C20-2015-4%20Fundamental%20Data%20Themes%20Report.pdf
Digital government	Government designed and operated to take advantage of information in creating, optimising, and transforming, government services.	Digital government Joinup (europa.eu)

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	Commission Implementing Regulation (EU) 2016/7 of 5 January 2016
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.	Evidence-based policy making Joinup (europa.eu)
GeoDCAT-AP specification	Data Catalogue vocabulary (DCAT) Application Profile extension for describing geospatial datasets, dataset series, and services.	GeoDCAT-AP Joinup (europa.eu)
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.	LIFO Guidelines and Recommendations
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.	https://joinup.ec.europa.eu/collection/european-union-location-framework-eulf/document/recommendation-6
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	LIFO Guidelines and Recommendations Unlocking the Power of Location: The UK's geospatial strategy 2020 to 2025

Term	Meaning	Link
Location information strategy	A strategic approach for managing and maximising the value of location information.	Location information strategy Joinup (europa.eu)
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 noncontributors alike. Prominently used for the development of open source software.	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1096442
OpenAPI	Specification for machine-readable interface files for describing, producing, consuming, and visualising RESTful web services.	https://swagger.io/specification/
Open licence	An open licence is a way for the copyright holder (creator or other rightsholder) 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.	https://ec.europa.eu/programmes/erasmus-plus/programme-guide/part-c/important-contractual-provisions/open-licence-intellectual-property-rights_en
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	https://docs.oracle.com/javaee/6/tutorial/doc/gijqy.html
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).	https://inspire.ec.europa.eu/call-facilitators-%E2%80%93-thematic-clusters/50
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'.	Spatial Data Infrastructure Joinup (europa.eu)

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Annex 1: LIFO 2020 Scoring methodology

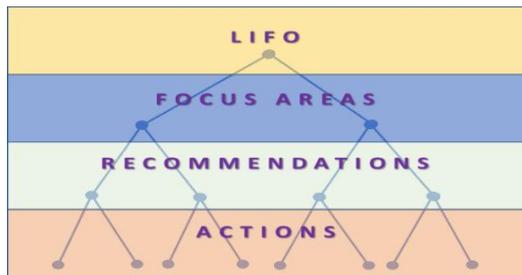


Figure 21 – Hierarchy of indicators and indexes

The LIFO model, described in the *LIFO 2020 Guidelines and recommendations*⁸⁹, is based on a hierarchy of indicators and indexes, as represented in [Figure 21](#): from bottom to top, (action) indicators, recommendation indexes, focus area indexes and LIFO index.

(Action) Indicators: A number of actions⁹⁰ 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.

⁸⁹ https://joinup.ec.europa.eu/sites/default/files/inline-files/2020_LIFO_Guidelines_2.pdf

⁹⁰ 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?	
Recommendation 4			
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?	
Recommendation 5			
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?	

Focus Area: Digital Government Integration			Changes vs 2019
No.	Indicator	Question	
Recommendation 6			
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
Recommendation 7			
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 five actions in the INSPIRE country fiche: <ul style="list-style-type: none"> - Availability of spatial data and services - Conformity of metadata - Conformity of spatial data sets - Accessibility of spatial data sets through view and download services - Conformity of the network services 	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?	
Recommendation 8			
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
Recommendation 9			
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?	

Focus Area: Standardisation and Reuse			Changes vs 2019
No.	Indicator	Question	
Recommendation 10			
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
Recommendation 11			
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?	
Recommendation 12			
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 with Regulation (EU) No 1089/2010 (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)	
Recommendation 13			
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?	

Focus Area: Return on Investment			Changes vs 2019
No.	Indicator	Question	
Recommendation 14			
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?	
Recommendation 15			
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
Recommendation 16			
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	
Recommendation 17			
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	Multiple choice in 2019, single choice in 2020

		location information in Digital Government?	
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
Recommendation 18			
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?	
Recommendation 19			
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 2019⁹¹, with the aim to improve the capability of the LIFO model to represent consistently the state 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:

⁹¹ 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>

- 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: Slovakia

Title	Attachment ⁹²
LIFO Survey questionnaire 2020 – Slovakia	 LIFO Survey 2020 Slovakia
LIFO Survey questionnaire 2020 scores and charts – Slovakia	 LIFO 2020 scores and charts Slovakia

FOCUS AREA	SK 2020 v SK 2019			SK 2020 v EUR 2020 (all countries)			SK 2020 v EUR 2020 (2019 countries)			SK 2019 v EUR 2019		
	SK 2019	SK 2020	+/-	EUR 2020	SK 2020	+/-	EUR 2020	SK 2020	+/-	EUR 2019	SK 2019	+/-
Policy and strategy alignment	0.53	0.54	0.01	0.62	0.54	-0.08	0.68	0.54	-0.14	0.57	0.53	-0.04
Digital government integration	0.31	0.25	-0.06	0.57	0.25	-0.32	0.59	0.25	-0.34	0.54	0.31	-0.23
Standardisation and reuse	0.49	0.53	0.04	0.55	0.53	-0.02	0.62	0.53	-0.09	0.54	0.49	-0.05
Return on investment	0.60	0.56	-0.04	0.58	0.56	-0.02	0.64	0.56	-0.08	0.60	0.60	0.00
Governance, partnerships and capabilities	0.30	0.37	0.07	0.45	0.37	-0.08	0.49	0.37	-0.12	0.44	0.30	-0.14
LIFO INDEX	0.45	0.45	0.00	0.55	0.45	-0.10	0.60	0.45	-0.15	0.54	0.45	-0.09

⁹² 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.