

# Final methodological report

Title: Final methodological report

Project: The GSGF in Finland – Integration of geospatial and statistical information in Finland (GSFI)

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## 1. Introduction

This report summarises the main activities and results of the project: ‘The GSGF in Finland – Integration of geospatial and statistical information in Finland (GSFI)’. The GSFI project was a two-year project 1.2.2023–31.1.2025 and funded by Eurostat.

The general objective of the GSFI project was to take the next step after the GEOSTAT4 project by adapting the GSGF Europe to the Finnish context. The work was based on a vision in which data from a range of sources and types for multiple purposes are easy to use and analyse in different geographies. In practice, this means that statistics are geospatially enabled, and these geospatial statistics are nationally and internationally interoperable. It is also required that the selected geospatial production solutions make information production more efficient. The work in the project was based on The Global Statistical Geospatial Framework (GSGF) and its adaptation to the European context GSGF Europe (EFGS, 2024).

The goal of the project was to gain a common understanding of the state of integration of geospatial and statistical information and the development goals in Finland. This means interpreting GSGF and GSGF Europe in the Finnish operating environment. The project also implemented a case study of GSGF in Statistics Finland's Business Data Production Process. In order to unify the regional divisions, the project prepared a proposal for a new national small-area division model. One important goal was that stakeholders have a common understanding of the situation and direction. In addition to the present state analysis, an analysis of the target state architecture was carried out, development needs were defined, and a road map and a draft of the management model were drawn up. The goal was to support the continuation of the work after the completion of the project. The project's products and learning experiences were also shared not only nationally but also in the Nordic countries and more widely.

The project was carried out by Statistics Finland and the Finnish Environment Institute in cooperation with the National Land Survey of Finland as a subcontractor. Statistics Finland acted as the project coordinator. The project also collaborated closely with the national Network for Integration of Statistics and Geospatial Information (NISGIF).

This report summarises the work done in the project. The report describes the activities and experiences of the project. All deliverables produced in the project are listed in Annex A and the milestones in Annex B.

## 2. GSFI project

### 2.1. Project's objectives and results

The objectives of the GSFI project have been,

1. to take the next step in the implementation of the global GSGF after the GEOSTAT4 project by adapting the GSGF Europe to the Finnish context. The GSGF Finland will be supplemented with studies on the integration of the recently launched national data quality framework and development of national privacy policies. A common understanding is built about the present situation and needs for action in the implementation of the GSGF in statistical production in Finland. The results are compiled using the enterprise architecture framework in the form of a national model that builds a continuum for the international and European GSGF documents. It includes architecture views and core concepts (statistical geospatial terminological glossary).
2. to develop a proposal for a new regional division model of local statistical areas (small areas) to increase national interoperability of geospatial statistics. The proposal includes benchmarking methodologies, surveying of stakeholder needs, evaluation of methods and a (semi) automatic production method of the produced model.
3. to describe how to enable the assimilation of geospatial information through a centralised business data source and other data sources linked to the corresponding places of business.
4. to ensure the maintenance and further development of the outputs after the project by creating a draft about the maintenance model
5. to provide a representative benchmark of the national implementation model of the GSGF Europe with a complementary description of the national model and lessons learned
6. to collaborate with the Network for Integration of Statistics and Geospatial Information in Finland (NISGIF) and thereby to enhance the co-operation of the organisations involved in the national implementation of the GSGF. To ensure a seamless continuation of the work after the project the aim is to build a mutual understanding of the first development steps to meet the objectives of the GSGF.
7. to share knowledge and solutions with the colleagues in Nordic countries (Sweden and Norway) and with the European EFGS community to maximise the benefit of the output.
8. to coordinate and manage successfully the joint project.

The results of the GSFI project are:

- The completed GSGF Finland (GSFI) document
- Proposal for a new small area division model in Finland and a pilot version of the small area division
- GSFI development roadmap (draft)
- Statistical Geospatial Glossary
- An analysis on data protection in the integration of statistical and geospatial data in Finland
- A study on practical approach in developing the integration of statistics and geospatial information through value chains and data quality in Finland
- Target architecture descriptions

- A Case Study on Geospatial Information in the Business Data Production Process Finland – A Case Study
- GSGF Finland: National Maintenance Model (draft)
- Building a national GSGF model - experiences in Finland
- Proposal for developing the operations of the Network for Integration of Statistics and Geospatial Information in Finland (NISGIF)
- Cooperation and participating in two Nordic meetings and a document about the remarks in Finland
- Develop the GSFI Website

## 2.2. Structure of the project

The GSFI project consortium was comprised of Statistics Finland (coordinator) and Finnish Environmental Institute. The National Land Survey of Finland worked closely in cooperation as a sub-contractor. The project also cooperated with the national network (NISGIF). Currently, there are approximately 30 stakeholder organisations from government agencies, ministries, municipalities, academia, and private sector in the network. They are there to learn from each other, to brainstorm and to solve common data integration challenges together.

Furthermore, a cross-domain steering body between Statistics Finland, National Land Survey of Finland and Finnish Environment Institute took on the task as project’s advisory body. The group proved to be very valuable in providing advice and guidance to the project. For instance, studying of the value chains (see Chapter WP2) emerged in the group.

The project was divided into four work packages, of which WP1 concentrated on the project management and communication. Figure 1 below outlines how the work in the project was organised in practice. There were three main lines in WP2, in which the national interpretation of the GSGF, the proposal for a new small area division model, and a case study were built. Furthermore, national network cooperation, communication and international collaboration formed cross-cutting themes that generated ideas and provided inputs for the three main themes in the work packages 3 and 4.

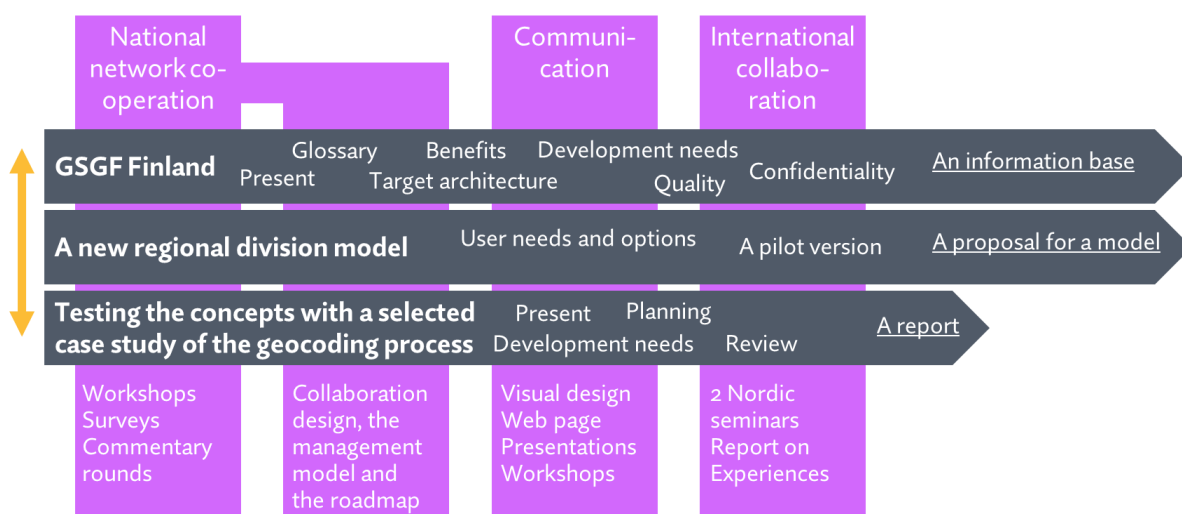


Figure 1. The work structure of the project.

## 2.3. Project methods

The project aimed to achieve its outputs cost-effectively by coordinating actions through Work Package 1. Other activities were organised into three work packages, each with specific tasks and milestones. This structure allowed for focused efforts on deliverables and transparent progress tracking. However, it turned out that there was a clear need to work extensively across work packages and tasks. Ideas were tested and solutions were created together, especially between WP2 and WP3.

The project collaborated closely with the national Network for Integration of Statistics and Geospatial Information (NISGIF). There was continuous communication between the project and the national network from the very start of the project. The working methods included presentations in general meetings of the national network in 2023 – 2024 as well as, surveys and consultation rounds with the national network. It was also organised two facilitated hybrid workshops and one virtual workshop. One important aspect for the national collaboration was that the leaders of the national network were also members of the project team and thereby showed commitment to the project. In addition to the actual project meetings, tasks and plans of the project were also discussed in the coordination meetings of the national network. These methods ensured comprehensive feedback and introduced the project work and its progress to the network members.

The project used virtual co-working methods and tools. The key tool within the project group was Teams. Some difficulty was caused by changes in other available tools. In particular, due to organisational policies, virtual workspace used with the national network was removed from the selection of available tools in the middle of the project.

## 3. Results of work packages

### 3.1. WP1 Project management and coordination

Work package 1 consisted of project management and communication, starting with the refinement of the project plan and creating visual design for the project. There were also several presentations of the project and its work in different national and international events. Especially, the development of a new regional division model attracted interest. Information about the project and its outcomes were also provided on the web site [stat.fi/GSFI](http://stat.fi/GSFI) (in Finnish).

#### 3.1.1. Management of the consortium (1.1)

The project was divided into four work packages, including one focused on project management. The work itself was more iterative, requiring collaboration across tasks and work packages as well as, continuous development of new methods. Therefore, the tasks and milestones provided essential structure and supported progress monitoring.

Kick-off meetings were held for both the project group and the national network. Coordination meetings were integrated into the regular coordination meetings of the national network. Project and sub-group meetings were scheduled at varying intervals, depending on the needs and intensity of the work phase.

The project manager and coordinator managed official communications through the EU Grant Management Service. All project outputs were uploaded with explanatory comments as needed. An interim progress report and this final methodological report were produced for Eurostat, which oversaw the project. National progress and performance reports were created within the three

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participating organisations. The cross-domain steering body, comprising Statistics Finland, the National Land Survey of Finland, and the Finnish Environment Institute, provided national advisory.

### 3.1.2. Communication (1.2)

The project and its results were showcased at various national and international events. Information about the project and its activities was also made available online. The final project results will be presented to the national network at a dedicated meeting in January 2025. For key stakeholders, a final workshop will be held to discuss the project's deliverables and plan for the future. The goal of this meeting is to summarise the project's achievements and ensure the ongoing management and development of the deliverables even after the project concludes.

The key presentations in addition to the meetings and workshops organised by the project or the national network:

- GEOS-Grants kick-off, Luxembourg 6.3.2023
- Municipal network meeting, Finland 18.4.2023
- Geospatial information seminar organised by Helsinki Region Environmental Services, Finland 3.5.2023
- The National Council for Geographic Information meeting, Finland 12.5.2023
- Joint UNECE, Eurostat, UN-GGIM Europe Workshop on Integrating Statistical and Geospatial Data, Serbia 4.-5.10.2023
- GeoForum Summit (a 1-hour slot), Finland 30.10.2023
- GISCO Working Group meeting on integration of statistical and geospatial information, Luxembourg, 12.-13.3.2024
- European Conference on Quality in Official Statistics 2024, Portugal 5.-7.6.2024
- GeoForum Summit (a 1-hour slot), Finland 7.-8.10.2024
- Eighth meeting of the Expert Group on the Integration of Statistical and Geospatial Information jointly with the seventh meeting of the Working Group on Geospatial Information of the IAEG-SDGs, Nairobi, Kenya 17.-19.9. 2024
- European Forum for Geography and Statistics EFGS 2024, Slovenia 10.-12.12.2024
- UN EG ISGI virtual meeting, 17.12.2024

Furthermore, the invitation list for the two half-day workshops and closing event organised by the project was extensive covering approximately 80 network members. The invitations were open to other interested parties too.

The project also participated in writing a blog post on the GSGF and GSGF Europe for UNECE's INGEST Blog Series by Sara Stewart in the end of year 2023.

### 3.1.3. WP1 Key findings

At the planning stage, the project may have appeared compact and clearly structured. However, the focus on ecosystemic development and planning introduced its own challenges to project management and coordination. Implementation required occasional pauses to mature ideas, and it

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was difficult to estimate the workload in advance, as the specifics became clearer only as the work progressed. The connection to the cross-domain steering body between Statistics Finland, the National Land Survey of Finland, and the Finnish Environment Institute was also a crucial strategic channel that could have been utilised even more extensively.

The project also encountered difficulties in securing resources at the right time, and some key competencies were lost during the project. Near the end, the project manager temporarily changed employers, resulting in the project coordinator acting as the project manager for the last two months. This all required proactive adjustments to the project plan to adapt the schedule and budget to the new situation. Despite these changes, the project's final outcomes and agreed-upon tasks were not affected. The project's internal flexibility in both scheduling and budget allocation proved essential to its successful completion.

Visual design and the naming of the project and its outputs are crucial for identifying and marketing the entity. In hindsight, we could have placed more emphasis on discussing the business aspects and benefits. However, it is possible that our understanding of the entity was not mature enough for such discussions. These are also rather abstract topics, which can easily be overshadowed by the demands of everyday work. Thus, let this be a tip for further discussions and work.

In summary, the project faced challenges and some delays. In Autumn 2024, we had to address the delays in the work. Simultaneously, there were changes in resources, and structure of the roadmap and GSGF Finland still needed refinement. These factors combined to create a high work volume. At that point, it was already evident that achieving the project's objectives was not straightforward. Nevertheless, the work generally progressed at a good pace and with a positive spirit. These insights and challenges have shaped our ongoing journey within the framework and, we believe, guided us toward better practices and outcomes.

### 3.2. WP2 GSGF Finland

The objective of the WP 2 was to take the next step in the implementation of the global GSGF after the GEOSTAT4 project by the adaptation of the GSGF Europe to the Finnish context. This section describes the results of the national implementation of the GSGF. The experiences are described in the document European Added Value (D3.1).

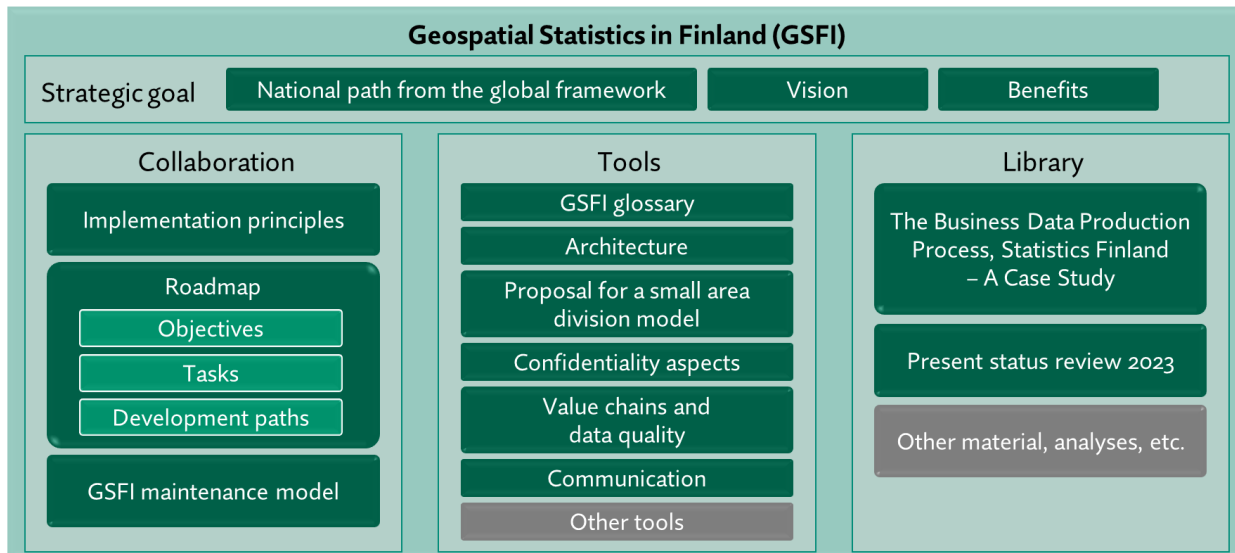


Figure 2. The structure of GSFI.

#### 3.2.1. Adaptation of the GSGF Europe to the national context (2.1)

The work began with a review of the present status of integrating statistics and geospatial information in Finland, drawing on the Requirements and Recommendations of GSGF Europe (results of the GEOSTAT 4 project). The R&R dissects the GSGF into smaller components, providing a systematic lens to assess the national operating environment from a GSGF perspective. While the status of each item was being assessed, extensive discussions were held to clarify the understanding of each principle of the GSGF, as well as the requirements and recommendations of GSGF Europe. An important part of this was that the results of the discussions were articulated in Finnish. Thus, the discussions also provided input for the terminology work and vice versa.

The present status review was carried by a group of experts and was informed by insights from the national network, as well as the architectural efforts undertaken by the national integration network. This analysis identified strengths and areas for development, leading to the creation of an initial set of development needs.

During the work, several recurring needs for change were identified, spanning from one GSGF principle to another and concerning more the ways of working than individual development cases. These needs were separated from development needs into their own group and gradually formed the principles for implementing GSGF in Finland. The implementation principles are like refinements of the key elements of the original GSGF. The next phase, the actual development roadmap planning, was challenging. Implementing the identified development requires, among other things, co-development by several actors, new resources, and cross-administrative cooperation. The project did not have the ability to prioritise or mandate progress.

In the first planning round, it was decided to describe the goals based on the development needs and the tasks required to achieve these goals, principle by principle. As this phase was nearing its end, feedback was received suggesting that the roadmap should include schedules and responsibilities for the tasks. The results achieved so far were presented to the network, and a workshop was organised to identify individual sub-tasks that would somehow contribute to the already identified higher-level tasks. The sub-tasks were also placed on a timeline. The same process was repeated at the strategic level with the strategic steering group. One more iteration was needed to finalise the structure of the roadmap. After discovering the OKR method, it was tested with the network's results and presented at the network's meeting. The roadmap has received positive feedback from the strategic steering group and the national integration network.

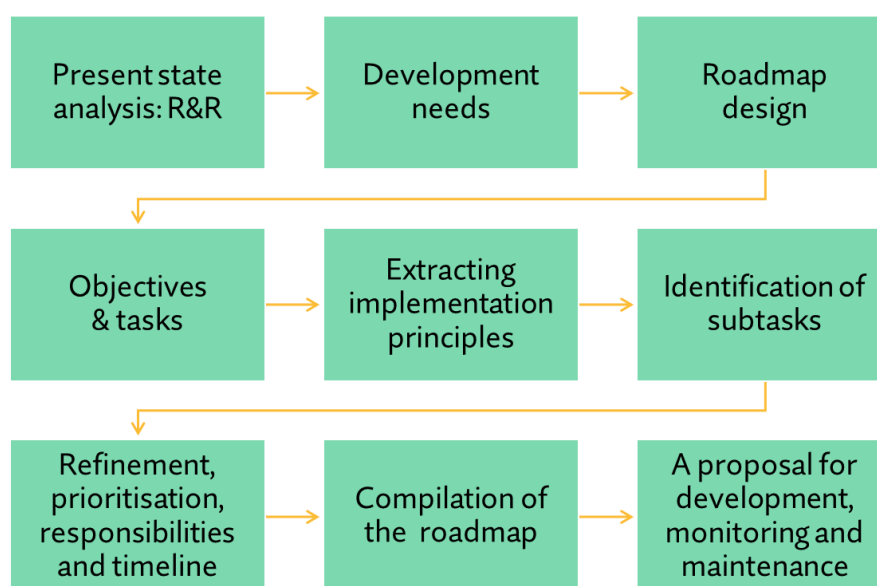


Figure 3. Developing the GSFI roadmap.

In addition to the goals of the roadmap, it was seen necessary to describe the vision, i.e., the kind of world we want to move towards. It was also important to identify the benefits we expect to gain on the way to the vision. Only in this way can we justify the necessity of the work.

The enterprise architecture work began with a review of GSGF Europe's architectural materials, which served as the foundation for describing the target state. Using the enterprise architecture method we produced target state architectural views of the roles and services of the spatial data infrastructure for statistical production. We produced target state architectural views of roles and services, layered view which specified the composition of these services, data flow view which clarifies the responsibilities between the roles in the spatial data infrastructure. We also produced a current state architectural view about roles and actors. The roles presented in the view are based on the roles identified in the GSGF Europe work, to which actors present in Finland have been linked. We also produced information architecture view about target state of area hierarchy. With target state architecture views and case studies, we concretised and tested our ideas. All three organisations participated in the architecture work, and especially the discussions between the architects of Statistics Finland and the National Land Survey of Finland strengthened the foundation for future work to integrate these two fields more closely.

A terminological glossary was initiated alongside the roadmap work, resulting in a terminological glossary of 31 terms. The creation of the terminological glossary was managed by a working group composed of experts from the target field, together with a terminologist. The working group included members from Statistics Finland, the National Land Survey of Finland, and the Finnish Environment Institute. The terminologist came from the Finnish Terminology Centre. Members of the working group were required to actively commit to the work and participate in workshops. Altogether, six workshops took place. The terminologists provided the working group with an introduction to the principles of terminology work. The terminologist was responsible for managing and scheduling the work, as well as producing content and ensuring the systematic nature of the material produced. The work phases included collecting and selecting concepts and identifying source material, concept analysis, producing terms, definitions and relationships of concepts, an open comment round, publication preparations, and informing about the publication. Additionally, the glossary was translated into English. However, the translation does not correspond to the terminological dictionary produced by actual terminology work.

The study of confidentiality, i.e. data protection in the integration of statistical and geospatial information, focused on the outputs of the GEOSTAT 4 project deliverable 'GSGF Europe' and international publications, while also highlighted national perspectives. The work was carried out by the experts of data protection and statistics of Statistics Finland.

The project examined the value chains of data, at the request of the project's advisory body. Through the case study of the Business information system, the flow of data and the changes in its value were examined in the data process. As the work progressed, it was found that the information introduced at the process stage did not necessarily meet the needs and had to be corrected or changed. Degradation of value can even be observed in the flow of data. The innovation of the work was the idea of utilising the national data quality framework in the examination of value chains, and more specifically in examining the degradation of value. The value chain perspective can be used to describe and understand the quality of data at the junction points of data flow. At the same time, a natural way was found to integrate data quality review into GSFI using the national data quality framework.

Material produced in WP2 is available on the GSFI web page<sup>1</sup> or in the Teams team of the national network.

### 3.2.2. A proposal for a national small area division model (2.2)

The concept of a small area refers to a statistical unit that breaks down municipalities into smaller, more detailed geographic areas. The definition and establishment of small areas are an integral part of statistical work in countries that use a census-style collection of population data. Examples of such countries include England and Wales, Australia, the USA, and New Zealand. In each of these countries, the hierarchy of area divisions is updated for each census. In contrast, in countries where population statistics are based on registers (i.e., continuous monitoring of demographic changes), there are different types of small area divisions that have been formed from other starting points. These often rely on existing historical area divisions (e.g., Norway) or voting districts (e.g., Sweden).

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<sup>1</sup> GSFI and Eurostat, 2024. Geospatial statistics in Finland (GSFI). A web page. In Finnish. EU. 101112903 - 2022-FI-GEOS-GSFI. [Paikkatiedot Suomen tilastotuotannossa, GSFI | Tilastokeskus.](https://stat.fi/org/tilastokeskus/toiminnan_suunnittelu/paikkatiedot-suomen-tilastotuotannossa-gsfi.html)  
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Currently, Finland lacks a unified system for dividing these areas. To address this issue, our proposed division model aims to establish a classification system that is compatible with administrative boundaries and consistent throughout the country. This new model will serve as the foundation for creating more granular area divisions, ultimately enabling the production of nationally standardized geographic units.

The small area related development process contained two main goals:

1. Developing data needs description including a comprehensive outline detailing the data requirements for implementing a new nationwide small-area division model.
2. A proposal for implementing a nationwide small area model.

During the project, several key steps were undertaken to establish the foundation for the new small-area division model. A stakeholder survey was conducted to gauge the need and content of small areas, providing valuable insights into the requirements of various stakeholders. The survey received 58 responses. The respondents came from all over Finland and had expertise in geospatial data. They worked in different organisations, including local government offices, regional or local actors, national actors, universities and companies. The survey responses highlighted various information needs and perspectives. The respondents considered the topic to be very important and viewed the work on creating a national small area classification as useful. Stakeholders were engaged to the process also during the development process in workshops and meetings organised with the Network for Integration of Statistics and Geospatial Information (NISGIF).

The findings from the survey led to a decision to propose an area classification system where small areas are based on smaller building blocks as base areas. This approach allows for more detailed and nuanced divisions of geographic units. The approach is similar to small area geographies produced for Australia, UK and New Zealand (Australian Bureau of Statistics, 2024; Stats NZ, 2022; Cockings et al. 2013). To test and refine this concept, different approaches and datasets were evaluated for forming these base areas. The outcome of this research was the development of a method that utilises GIS-datasets to create base areas, which can then be merged into small areas. The selected approach diverged from international examples of census-based small area geographies by relying more on urban form, functionalities, and geographical boundaries as a defining measures in the formation of basic areas and small areas.

The developed approach and method resulted in the creation of a pilot version of the small areas for test areas. The actual process of data evaluation, method development and data processing turned out to be very time-consuming. This led to calculating the pilot data only to selected municipalities, which represent different area types. The GIS method and data processing were coded providing automated model for generating the outputs for the whole Finland later. In general, the conducted analysis lays the groundwork for a more comprehensive and uniform system of geographic divisions across Finland.

### 3.2.3. A case study – implementation of the GSGF in a business information system, YTY (2.3)

The work started with a current state analysis of the integration of geospatial information in Statistics Finland's business information system and centralized business data processes.

Utilizing the current state analysis, existing strengths and development needs were identified, defined and finally peer reviewed. In addition, the case study and the current state analysis played a key role in

identifying how value chains and quality aspects can be applied in identifying process-related development needs.

Both the current state analysis and the findings based on it were presented in different national and international contexts. The findings were also published on the GSFI-related webpage [stat.fi/GSFI](http://stat.fi/GSFI) (in Finnish) produced by the grant project.

Incorporating a concrete case study as part of the GSGF grant project has proven to be a valuable asset. This case study serves as a practical example for organising geospatial information related to statistical processes in a coherent manner and in line with most of the principles set by the GSGF. Through the case study, several development proposals have emerged and ideas have been tested, e.g. in formulating value streams and chains of statistical information.

With the case study, it has become evident that the situation looks different depending on which level you look at. Individual processes do not operate in isolation; they are influenced by their organisational context. At the same time, these processes do not think or see outside of their organization. This raises the question of how to facilitate parallel development across different levels and across organisational boundaries.

In our example, a case study around the business register highlighted the enormous impact of better data flow. The data surveys of business register data could potentially be discontinued if the information in the authorities' registers were supplemented with standardised address data and by ensuring data linkage.

#### 3.2.4. A national maintenance model, draft (2.4)

Thoughts and understanding accumulated during the work were compiled into the national governance model, providing insights into what maintaining the implementation of cross-sectoral GSFI could mean in practice. At the same time, a few key processes to be adopted in the initial phase were identified and preliminarily described. The architecture work, in turn, highlighted roles where critical national actors for implementation were still missing. The governance model is still a draft, and in the next phase, this document needs to be addressed at both strategic and expert levels. It needs to find a responsible party, and its content should start being implemented. The participating parties must commit not only by providing human resources but also by taking responsibility for any potentially needed outsourced human resources.

#### 3.2.5. WP2 Key findings

- **Diverse stakeholder landscape and geospatial information capabilities:** The key stakeholder group involved in this work was extensive and varied with diverse priorities. Their perspectives and needs span a wide spectrum, making it essential to tailor the approach accordingly. Furthermore, across different organisations, the level of geospatial information expertise varies significantly. This diversity posed design challenges for the project's outputs. For example, finding the best way to encompass this broad scope has caused delay in production of the architectural descriptions.
- **Architecture work:** Architectural views made with Archimate notation proved to be an excellent means of communication when discussing between organisations. Similar types of architecture views had also been made in other organisations and sharing these images would be beneficial for the entire ecosystem.

- **Terminology work:** The efforts in terminology development encountered a hurdle due to a scarcity of source material. This scarcity posed challenges for the terminologists in preparing workshops. The lack of foundational material necessitated extra effort in shaping common understanding. Diverse perspectives were another challenge in the terminology work. Within the working group, it was noticed that geospatial and statistical-geospatial production experts often view concepts from different angles. Bridging this gap required prolonged discussions to establish a common ground. It was learned that investing time in selecting essential concepts based on this experience is crucial.
- **Expertise-driven translation:** To truly grasp the essence of each principle, goal, and recommendation, it was needed to invest time in translating selected portions of the material to fit our specific context. This process was enlightening, revealing nuances that might otherwise have been missed. Due to language differences, the terms to be utilised may not be directly translatable, and the meaning or scope of the words may differ.
- **Interpreting GSGF Europe guidelines:** When producing national materials, it was found crucial to cross-check each person's understanding of the focus and goals outlined by GSGF Europe. Different stakeholders may interpret these guidelines differently, necessitating careful alignment within the national context.
- **Importance of a practical case study:**

The case study was found to be a valuable asset for the project as it served as a practical example on how geospatial information can be integrated into various statistical processes in a coherent way. Incorporating a practical case study in a descriptive project can give valuable insight into production processes and their needs.

### 3.3. WP3 Stakeholder engagement

The objective of the WP 3 was to provide a representative benchmark of a national implementation model of the GSGF Europe as well as to enhance the cooperation of national organisations involved in the implementation of the GSGF in Finland. In the end of the first project year, it was compiled the first remarks of the work to support later work with the deliverable D3.1 Building a national GSGF model – experiences in Finland. This progress report draws on that material too.

The national Network for Integration of Statistics and Geospatial Information (NISGIF, founded in 2021) was identified as the key stakeholder group and partner in the implementation of the project. Leaders of the national network actively participate in this project. Two-way dialogue has been established and maintained between the project team and the national network right from the outset.

Numerous project activities were conducted in close collaboration with the network, including a workshop in May 2023 and presentations during each network meeting throughout the same year. Additionally, the project facilitated the completion of a self-evaluation survey for network members. This survey aimed to assess the network's success at the 2-year milestone and identify areas for improvement. Notably, the project activities increased enthusiasm within the network in 2023. As a result, new topical activities were launched within working groups. The project's focus on basic structures allowed space for innovation.

### 3.3.1. European added value (3.1)

The national implementation of GSGF was a fascinating journey. The experiences we gained, the ideas we generated, and the documentation we created can serve as valuable resources for other countries embarking on their own implementation efforts. We believe our pioneering work will provide concrete benefits, helping to streamline the path for others by sharing the lessons we learned along the way.

We are confident that the solutions developed during this project will pave the way for successful implementation. These solutions include utilising the GSGF Europe R&R material as assessment tool, structuring goal setting, identifying implementation principles, developing steps for actions, integrating value chain and quality perspectives into the GSGF framework, utilising the enterprise architecture method, and creating a comprehensive glossary using terminological methods. Furthermore, we achieved significant insights through a use case, illustrating how GSGF concepts can be effectively applied in a real statistical production environment. We strongly recommend testing ideas with a real statistical production case when embarking on GSGF implementation. Although the model is structured at an abstract level, the true benefits are realised mostly at the level of concrete actions.

The key findings from the implementation of GSGF were compiled into the document "Building a national GSGF model – experiences in Finland". It provides a complementary description of the national model and lessons learned.

### 3.3.2. Network collaboration (3.2)

The project aimed to enhance cooperation among the organisations involved in the national implementation of the GSGF through its collaboration with the Network for Integration of Statistics and Geospatial Information in Finland.

The construction of GSGF Finland, network collaboration, and the creation of the roadmap were closely intertwined, making it difficult to separate these tasks from each other. Some practical aspects of the collaboration between the project and the national network were already discussed in Chapter 2.3, 'Project Methods'.

In the roadmap, the first development steps to meet the objectives of the GSGF were built in a development path of the national network. The aim was to ensure a seamless continuation of the work after the project.

In the roadmap work, it was outlined together with the network, the initial development steps for the national network to meet the GSFI objectives, ensuring a seamless continuation of the work after the project's conclusion. The national network was also seen as a channel for the participating organisations to commit to common national goals and building new development paths with the organisations.

A survey was conducted for the network, with the project contributing its own questions and providing analysis and suggestions for development of operations, considering also the implementation of GSFI.

Identified development needs were drafted into a development roadmap in cooperation with the national network, as described in Chapter 3.2.1.

The project organised two interactive workshops to present results and ideas, gather feedback, and seek engagement on the project's outputs.

### 3.3.3. WP3 Key findings

- **Effective collaboration methods:** Project's interactions with the national network revealed valuable lessons. After experimenting with various facilitation methods during national network meetings, it was reached a consensus: general network meetings should primarily focus on information sharing. For more in-depth discussions and collaborative work, it was found that separate workshops and small group sessions centered around specific topics are more effective. In the workshops, it was also recognised the need for both detailed analysis and concise summaries. Balancing these requirements still requires work to ensure effective communication across the diverse audience in the implementation of GSFI.

### 3.4. WP4 Nordic Collaboration and Synergy

#### 3.4.1. Participation in Nordic workshops (4.1)

Two seminars were organised together with other Nordic projects with the 2022 GEOS grant 2022 agreements. The first meeting was arranged in Kongsvinger, organised by Statistics Norway in September 2023. The following seminar in September 2024 was organised by Statistics Sweden in Stockholm. In both seminars, the fundamental idea was to benchmark and share ideas with the other Nordic projects.

In the first Nordic collaboration workshop in Kongsvinger, Norway (19.-20.9.2023) there were altogether five presentations linked to the GSFI project:

- GEOS project FI: The GSGF in Finland - Integration of geospatial and statistical information in Finland (GSFI) project (Mervi Haakana, Statistics Finland)
- The current status and challenges of the integration of statistics and spatial information in Finland – interpreted through the GSGF model (Rina Tammisto, Statistics Finland)
- National stakeholder networks as a key tool in the GSGF implementation (Panu Muhli, National Land Survey of Finland)
- Management of location information of business register using centralized geospatial repository (Godfrey Lowndes, Statistics Finland)
- Development of a new local statistic area definition for Finland (Ville Helminen and Eetu Jutila, Finnish Environment Institute)

In the Stockholm seminar, GSFI project gave presentations linked to the project work and participated via panel discussions:

- GEOS Grant (2022) project FI: The GSGF in Finland - Integration of geospatial and statistical information in Finland (GSFI) project (Insight into GSFI project), Mervi Haakana, Rina Tammisto (Statistics Finland), and Ville Helminen (Finnish Environment Institute)
- Consolidation or survival? – Geospatial activities in Nordic NSI's session (Rina Tammisto gave Statistics Finland's answers)
- Cooperation between NSOs and Geospatial Agencies; Rina Tammisto (Statistics Finland) and Panu Muhli (National Land Survey of Finland) coordinated the session
- The future framework for longitudinal integration of geography and statistics (Rina Tammisto gave Statistics Finland's answers)

### 3.4.2. A common Nordic digital work platform (4.2)

The collaboration included hosting a common Nordic digital work platform organised by Statistics Finland. However, since the Norwegian and Swedish projects already had their own communication channels, the shared platform wasn't effectively utilised. Notably, the EFGS web pages were used for publishing materials from the Nordic seminars, making a shared workspace less critical.

### 3.4.3. WP4 Key findings

The Kongsvinger and Stockholm seminars provided valuable platforms for Nordic collaboration in geospatial and statistical data integration. The Kongsvinger seminar focused on historical statistics production and geospatial data, sparking new ideas and initiatives, such as enhancing the use of historical geospatial information. The Stockholm seminar emphasised integrated data and future collaboration opportunities, including developing harmonised, API-based Nordic platform for historical geospatial data. Both seminars highlighted the importance of collaboration, generating concrete development ideas that support future work.

For the three ongoing GEOS Grant projects, the seminars facilitated the sharing of information, experiences, and best practices, enhancing the projects' outcomes. Collaboration with other Nordic countries helped recognise and leverage each country's strengths, boosting motivation and encouraging progress. The exchange of knowledge highlighted areas for future focus and provided new perspectives and concrete ideas. This collaborative approach proved beneficial, enabling the projects to develop innovative solutions collectively.

The events were collaboratively planned by the three projects, which proved beneficial in highlighting key aspects. The program was drafted together in Teams meetings, prompting us to consider how our innovations could benefit others. This broader perspective is possible only when we better understand each other's work. Overall, working together on the grants projects was a very promising experience, and we recommend this approach to other projects as well.

## 4. Estimated finance

The project budget is managed by the project manager and project coordinator. Costs and expenditure were reviewed with the support of the financial departments of the participating organisations.

However, changes in key resources did slightly impact the allocation of working hours among the partners, and therefore, a budget transfer between partners was agreed upon. These changes did not affect the total budget amount.

## 5. Conclusions

The project achieved its goals and successfully introduced the GSGF model into the Finnish operational environment. It is noteworthy that implementing the project's work with a broad, cross-sectoral model like GSGF would have been very difficult if it had originated solely from national activities. As a generic model, GSGF allows for viewing the national data ecosystem from a top-down perspective – the boundaries between sectors do not hinder the examination, nor does funding from a specific sector determine the breadth of the data ecosystem's perspective. Thus, one conclusion from the project is that its subject was excellently suited for funding from a higher regional level.

## 6. References

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## Annex A. List of deliverables

The project has 13 deliverables, one of which was achieved during the follow-up period.

Del. No	Name	Due date	New due date	Delivery date	Approval date
D1.1	Presentation in Kick-off meeting	30.4.2023	-	5.5.2023	12.5.2023
D1.2	Interim progress report	29.2.2024	-	5.3.2024	6.3.2024
D2.4	Pilot version of the small area division	31.7.2024	20.12.2024	20.12.2024	
D2.5	Geospatial Information in the Business Data Production Process Finland – A Case Study	31.8.2024	-	9.9.2024	12.9.2024
D2.1	GSGF Finland	31.10.2024	20.12.2024	28.11.2024	
D2.2	Statistical Geospatial Glossary	31.10.2024	-	4.11.2024	
D2.3	Proposal for a new regional division model in Finland (Small areas)	31.10.2024	20.12.2024	20.12.2024	
D2.6	GSGF Finland: National Maintenance Model (draft)	30.11.2024	-	28.11.2024	
D3.2	A development roadmap (draft)	30.11.2024	-	28.11.2024	
D4.1	Nordic cross-projects cooperation – remarks in Finland	30.11.2024	-	28.11.2024	
D3.1	Building a national GSGF model – experiences in Finland	31.12.2024	-	20.12.2024	
D1.3	Final Methodological report	31.12.2024	-	20.12.2024	
D1.4	Presentation in Closure Day Conference	31.1.2025	-	Jan. 2025	

## Annex B. List of milestones

The project has 25 milestones. The milestones are in chronological order in the table.

No	Name	Date	Delivery date (actual)	Achieved	Comments
22	A digital work platform	28.2.2023	7.2.2023	Yes	-
1	Refinement of the project plan	31.3.2023	30.3.2023	Yes	A constantly updated document
18	Visual design	31.5.2023	15.9.2023	Yes	-
4	Review of the GSGF Europe: requirements and recommendations	30.6.2023	16.6.2023	Yes	-
12	Analysis of the present production and definition of the desirable change	31.7.2023	10.8.2023	Yes	-
23	Participation in Workshop 1	31.10.2023	20.9.2023	Yes	Nordic cooperation meeting in Kongsvinger, Norway 19.-20.9.2023
5	Review of the GSGF Europe: reference architecture	30.11.2023	28.11.2024	Yes	The diversity of the operating environment has posed challenges for architectural work.
9	Specifying the needs and options for the new regional division	30.11.2023	30.11.2023	Yes	-
6	Quality aspects in the GSGF Finland	31.12.2023	31.7.2024	Yes	The final compilation of quality aspects has faced delays due to loss of key competences.
16	Building a national GSGF model – the first remarks	31.1.2024	31.1.2024	Yes	-
2	Intermediate project check	29.2.2024	29.2.2024	Yes	-
7	Confidentiality aspects in the GSGF Finland	30.4.2024	15.10.2024	Yes	-
19	A collaboration plan with the national network NISGIF, draft	30.4.2024	30.4.2024	Yes	-

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13	Design of suggested solutions	31.5.2024	19.6.2024	Yes	-
21	A seminar with the national network	30.6.2024	13.5.2024	Yes	-
10	Development of the model for a new regional division	31.7.2024	20.12.2024	Yes	-
14	Review of the integrity and coverage of the design	31.8.2024	9.9.2024	Yes	-
8	Compiled GSGF Finland	31.10.2024	28.11.2024	Yes	-
24	Participation in Workshop 2	31.10.2024	13.9.2024	Yes	-
11	Piloting, evaluating and sharing of the new small area division	31.10.2024	20.12.2024	Yes	-
15	Design of a draft national maintenance model	30.11.2024	28.11.2024	Yes	-
25	Report on remarks and results of the Nordic collaboration, Finland	30.11.2024	28.11.2024	Yes	-
3	Final reporting	31.12.2024	20.12.2024	Yes	-
17	Building a national GSGF model – experiences in Finland	31.12.2024	20.12.2024	Yes	-
20	A development roadmap, draft	31.12.2024	28.11.2024	Yes	-