



Spatial Data Infrastructures in Lithuania: State of play 2010



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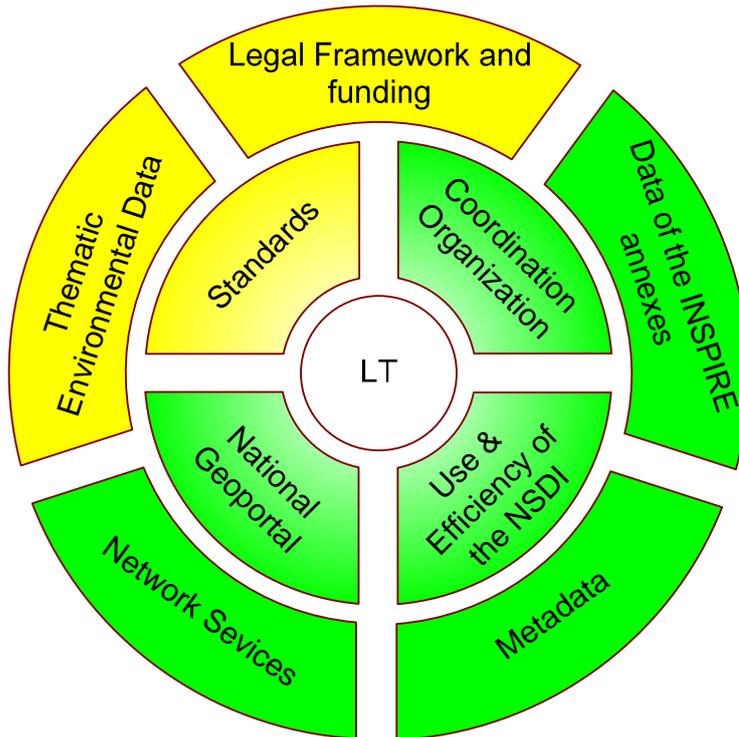
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Change matrix 2010 versus 2007

A concise graph is added to indicate changes of the various paragraphs compared to the previous report. Two colours are used: Green and Yellow indicating major and minimum changes respectively compared with the 2007 State of Play. This graph does not reflect the country situation. Merely it represents our findings/changes per section on our preparation of the desktop analysis



Executive summary

The Lithuanian GI policy is part of a strategy to promote the information-based society. In 2004, a detailed feasibility study was carried out within the Phare programme by ASTEC, an Irish consultancy company: *Development of the Lithuanian Geographic Information Infrastructure (LGII) – Project Preparation Facility*. Based on interviews, questionnaires and presentations amongst Lithuanian GI stakeholders, a vision was developed on the current status of the LGII and the way to go to develop a complete and operational NSDI for Lithuanian.

One of the goals of LGII is an open, shared infrastructure for accessing and distributing information products and services online. To achieve this goal, data residing at regional and national organizations are to be implemented to common standards. LGII is not just about technology, but about developing a clear framework of agreements among government agencies, and between the government, the private sector and citizens on the terms through which the use of PSI, including geographic information, can be maximized for the benefits of all. These agreements often require attention and political support at the highest level. The LGII project is composed by a number of partners such as: The National Land Service, SE “GIS-Centras”, SE Centre of Registers, Environmental Protection Agency, Lithuanian Geological Survey, State Forest Survey Service, State Protected Areas Service, Fire and Rescue Department, Lithuanian Road Administration, Vilnius Municipality. A specific aspect for the development of the LGII is the attention it pays to education and training. There is a fully operational e-learning portal with tutorials for 9 GIS related disciplines (as part of the NSDI development).

The National Land Service (NLS) under the Ministry of Agriculture develops the national strategy for spatial data acquisition and maintenance in the field, coordinates activities in relation to standards and oversees the protection of copyright. NLS is a NMA-type organization. Besides NLS, main actors are the Cadastral Agency and the Ministry of Environment.

The National Land Service (NLS) is in charge of the GCCIS: the Geodetic and Cartographic Control Information system and the LGII. The GCCIS initiative is no SDI, but a Spatial Information System with a series of applications (in development). Due to its mandate and GCCIS-database, the NLS/NSGC can be considered as the core body of the emerging Lithuanian SDI.

The Spatial data dissemination policy will be radically changed as soon as the changes of the law on Geodesy & Cartography will be approved. State authorities started consultations with NLS on how their datasets be linked via the national geoportal and how metadata be produced, but real activities will commence by approving the law and following legal acts (rules and regulations).

The national NSDI geoportal will be officially established as soon as the law on Geodesy & Cartography is approved. However the national geoportal www.geoportal.lt was actually launched at the end of 2008 as a result of the LGII project. This geoportal was

improved both in functionality and in data content by SE “GIS-Centras” and the LGII project partners under NLS supervision.

There is no national GI association. The Lithuanian Surveyors Association (public) and Lithuanian Cartographers Association (public) gives proposals to the Government but have no major impact on decision making.

Usage of data on Internet is free of charge for products produced by the Governmental institutions, by Ministries, by Seimas and non-profit organizations.

The Law on Copyright and Related Rights entered into force on 9 June 1999. The Copyright Act was a major step forward for the legal regime in Lithuania. It was drafted taking into consideration the EU directives and provisions of the Bern and Geneva Conventions. In the last eight years Lithuania has transformed its copyright law from the old Soviet-style one to a system that complies to a large extent with modern bilateral and multilateral standards.

A draft is currently being prepared for a new Law on Geodesy and Cartography, which will include the transposition of the INSPIRE directive and of Directive 2006/123/EC on services in the internal market. The new law will contain a definition of the Lithuanian SDI, and will regulate public access to geographic data and services (unless other legislation applies).

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Abbreviations and acronyms

CT	Core Thematic Data
DTD	Document Type Definition
EA	Environmental Agency
EU	European Union
ECTS	European Credit Transfer System
FGDC	Federal Geographic Data Committee
FIR	Further Investigation Required
GCIS	Geodetic Control Information system
GCCIS	Geodetic and Cartographic Control Information system
GEOLIS	Geological Information System
GI	Geographical Information
GIS	Geographical Information System
GIS-Centras	National Centre of Remote Sensing and Geoinformatics
GISFORM	GIS Forum
GPS	Global Positioning System
GML	Geography Markup Language
InGIS	Integrated GI System
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
ISO	International Organization for Standardization
LGII	Lithuanian Geographic Information Infrastructure
MapBSR	Digital map of the Baltic Sea region
MoE	Ministry of Environment
NGS	National Geological Survey
NLS	National Land Service
NMA	National Mapping Agency
NSGC	National Service of Geodesy and Cartography
NSDI	National Spatial Data Infrastructures
OGC	Open Geospatial Consortium
PPP	Public-Private Partnerships
PSI	Policy and legislation on access to public sector information
REF	Reference data
RPC	Remote Procedure Call
SDI	Spatial Data Infrastructures
SOAP	Simple Object Access Protocol
SSC	Swedish Space Corporation
WCS	Web Coverage Service

WFS Web Feature Service

WMS Web Map Service

1 GENERAL INFORMATION

1.1 Method

This report is summarizing the review of SDI in Lithuania, and reflects the degree to which the SDI situation in Lithuania is similar to the ideas set out in the INSPIRE position papers¹ and the more recent INSPIRE scoping documents.

The 2002 report was based on the analysis of various documents, project references and web sites readily accessible in English and Lithuanian. The national mapping bodies have installed bilingual websites (LT and EN) (see section 3.2 for the full list of references for Lithuania). However, most technical specifications were only available in LT version. Most resources were gathered from the Internet.

The report has been completed by integration and consolidation of written comments received in spring 2003, from Dr. Aldona Sjovald from the National Land Service.

Beginning of August 2005, SADL received the feasibility study carried out in 2004. There was not enough time to integrate the detailed findings of this study. Instead the most pertinent elements for the 2005 update of the state of play were integrated in the last version of this report. The update of 2006 was based on input from various sources and information obtained from presentations at the workshop “*Preparing the National INSPIRE Information Days*” (organized by JRC for the new and candidate Member States), was integrated. For the 2007 update, information was received regarding the data sets and services (using the template). No answers were received on the data sharing questions. Other information regarding legal issues could be found through other sources.

For the 2009 update the survey report was used along with the information extracted from the web and the various presentations from workshops and conferences. In this version obsolete information was removed, while a conclusion paragraph regarding the status of each indicator was added for each component.

1.2 The Lithuanian GI-, GIS- and SDI-scene

GI is extensively produced and used by various public institutions in Lithuania. In August 2004, a detailed feasibility study was carried out within the Phare programme by ASTEC, an Irish consultancy company: *Development of the Lithuanian Geographic Information Infrastructure (LGII) – Project Preparation Facility*. This is the first complete and detailed Lithuanian study in which the lines are set out to implement the NSDI. GI is also the subject of various policy documents and initiatives.

To some extent, the private sector participates as a contractor to public initiatives.

¹ INSPIRE position papers, final versions: RDM, ETC, DPLI, ASF, IST, IAS (latest version).

The Lithuanian GI policy is part of a broader strategy to create an information-based society for which two bodies are responsible:

- The Information Society Development Committee under the Government of the Republic of Lithuania and
- The Committee of the Development of Information Society in Seimas (Parliament).

Fundamental changes have occurred in the structure of the Lithuanian institutions involved in GI. Resolution no. 709 of 12 June 2001 on "the establishment of the National Land Service under the Ministry of Agriculture" reorganized and integrated into the NLS:

- The State Department of Geodesy and Cartography under the Government, as from 1 July 2001;
- The Land Management and Law Department under the Ministry of Agriculture.

Several cartographic databases and maps at small and medium scales of Lithuania have already been prepared by the National Service of Geodesy and Cartography and by the NLS, often in partnership with Sweden and Switzerland. Large scale geodatasets are in development. The NLS is the owner of the Geodetic and Cartographic Control Information system (<http://www.gkpis.lt/Home/tabid/36/Default.aspx>). The GCCIS initiative is neither SDI nor LGII, but a Spatial Information System with a series of applications.

Other main providers of GI are:

- State Enterprise Centre of Registers;
- Ministry of Environment
- The National Geological Survey (<http://www.lgt.lt>);
- The National Forestry Institute;
- The Department of Statistics.

The State Enterprise Centre of Registers has been established by the Government of the Republic of Lithuania (Decision No. 742, 08 07 1997). The Ministry of Justice is the founder. It is financed by budgetary funds and self-financing contracts (see also chapter 2.2.7). The State Enterprise Centre of Registers provides the GIS databases relating to land cadastre, administrative units, settlements, streets and addresses. It is building databases relating to land cadastre, administrative units, settlements, streets and addresses, including digital orthophotos in 1:10.000 scale and 1:5.000 in urban areas.

[2]

[\[1\]](#)

The National Geological Survey (NGS) is responsible for creating and maintaining geological databases on the national level. Under responsibility of NGS, the geological information system GEOLIS collects, uses and systemizes geological information/data and includes Internet browsing facilities.

The National Forestry Institute (Ministry of Environment) keeps the forestry cadastre and is developing a GI database of forest parcels.

The Department of Statistics is the official provider of socio-economic and statistical information.

The Rural Business Development and Information Centre was set up by the Ministry of Agriculture in 2001.

[\[2\]](#)

In 1993 there was signed an agreement between the State Department of Surveying and Mapping under the Ministry of Urbanistics and Construction and SSC Satellitbild (Swedish Space Corporation). According to this agreement there was foreseen to create the new National Basic Map and its database system in digital and paper format with the help of existing maps information, digital databases together with the most recent panchromatic ortho-image material (PAN) from the SPOT satellite and with geometrically rectified multispectral (XS) images. This was part of an international project "Development of Data Base for the Lithuanian National Map".

On the 30th of November 1994 the State department of Surveying and Mapping under the Ministry of Urbanistics and Construction charged the National Centre of Remote Sensing and Geoinformatics "GIS-Centras" to do the compiling work of digital database for the Lithuanian Republic space imagery map at scale 1:50.000. This data base was used for production of the printing originals. Compiling works for the digital data base for printing original production of the Lithuanian space imagery map at scale 1:50.000 (named LTDBK50000) were started on the 30th of December 1994 and were finished on the 30th of December 1996. There is a published LTDBK50000 version 1.0.0.

[\[7\]](#)

An international initiative in which Lithuania participates is the MapBSR (Digital map of the Baltic Sea region), covering the territory of Lithuania. A detailed description is given in the country report for FI (the MapBSR dataset can be obtained at the National Land Service, but information about the project, purchasing and prices can be obtained at the MapBSR home page <http://www.mapbsr.nls.fi>). The National Centre of Remote Sensing and Geoinformatics "GIS-Centras" is the direct Lithuanian partner in the MapBSR-project (<http://www.gis-centras.lt/gisweb/index.php?pageid=300>).

[\[5\]](#)

Lithuania spends up to about 4.5 m Euros annually for GIS related supply and services in the past years. Job expenses of State Employees using these services are excluded from this estimation. The volumes of GIS software sales in Lithuania are growing year by year. The total GIS software market in Lithuania in 2000 was about 3.8 m Euros.

[30]

The LGII

Lithuanian geographic information infrastructure (LGII) has been designed as an open, shared national spatial data infrastructure for accessing and distributing geographic information products and services online. It connects major public sector information sources through a single Internet portal (www.geoportal.lt) that has been launched in 2008.

Meanwhile the LGII involves the partnership of 10 Lithuanian governmental institutions and enterprises. They are connected by the centralized national metadata system and the federal geographic data system based on a uniform reference data model and standards. Geographic information classifiers and a national metadata profile have been prepared combining international standards and existing regulations in Lithuania. Besides the common web-services, LGII Internet portal also provides access to methodological base for geographic information management and use. Geographic data available through the LGII portal cover all themes of the INSPIRE Annexes I and II and some themes of the Annex III.

The main aim of LGII is to develop an official Geographic Information source system or Infrastructure and Information Environment allowing the free incorporation of GI into almost any Public Sector Information (PSI) Services. It is central to developing a sustainable national SDI to foster and to maintain relations of trust among all stakeholders (citizens, public sector, private sector and research). To achieve this goal, we need to encourage the collection, processing, archiving, integrating, and sharing of geospatial data and information using common standards and interoperable systems and techniques through the Internet.

The objectives of the project are to:

- *Provide GI (as part of PSI), prime digital material for almost any public sector information services, research, business and citizens at large – GI availability via the Internet;*
- *combine/interconnect the GI prime material data into different sources of added value electronic public sector products and services, hence leads to unprecedented possibilities to interconnect various register, databases, etc. – Interoperability;*
- *Foster substantial investment in creativity and innovation, and lead in turn to growth and increased competitiveness in both content provision and Information Technology and more generally across a wide range of industrial*

and cultural sectors. This will safeguard employment and encourage new job creation - Economic gain;

- *provide transparent and applicable environment for the re-use of GI, without which is a major barrier to bring out the full economic potential of this key information resource (There are considerable differences in the rules and practices relating to the exploitation of the current insufficient and fragmented available GI resources) – favourable conditions for business and industry.*

The purposes of LGII can be summarised as follows:

- ***Identify both users and providers** of spatial data in order to create an infrastructure that meets everybody's needs;*
- ***Encourage the development of partnerships** for creating geographic data for the various programmes in government, academic institutions and the private sector;*
- ***Increase usability of existing GI:** Provide an environment for users to share their information, knowledge and interests by easy access to good quality spatial data. That way, through consensus, an appropriate infrastructure can be established.*
- ***Encourage connections and coordination among government institutions, the private and educational sectors** through sharing of spatial data. The cooperation of organisations shall be intensified by the pulling together representatives from sectors of data production, research and education as well as the business sectors using spatial data.*

*Geographic information is rather a perspective to the **Information Society** and the general information infrastructure than just a separate sector of information technology.*

[\[30\]](#)

The project activities foreseen are the following:

1. Promote the vision of LGII
2. Set up a Coordinating Body
3. Datasets are made available without complying to a common standard (near-term)
4. Metadata collection (describe the data)
5. Develop LGII Portal (or clearinghouse, catalogue server)
6. Capacity building for all potential users (GIS tools) in the government
7. Project implementation

8. Pilot Project on Physical planning in Municipalities
9. Harmonisation (long term)
10. New data collection efforts, standards for data content (medium to long-term)

There is a complete and detailed implementation plan (starting in 2005 till 2008) and a cost estimate and financing plan. The table below gives an overview of the cost estimate:

<i>Deliverables</i>	<i>Units</i>	<i>Costs per unit, EUR</i>	<i>Total costs, EUR</i>
<i>Development of LGII unified data model and subsystem of classifiers</i>	<i>1</i>	<i>288.000,00</i>	<i>288.000,00</i>
<i>National metadata system</i>	<i>1</i>	<i>686.100,00</i>	<i>686.100,00</i>
<i>National geographic data system</i>	<i>1</i>	<i>1.811.300,00</i>	<i>1.811.300,00</i>
<i>Project financial and legal audit</i>	<i>1</i>	<i>124.800,00</i>	<i>124.800,00</i>
<i>Harmonisation GDB10LT and KDB10LT data</i>	<i>1</i>	<i>913.000,00</i>	<i>913.000,00</i>
<i>Reference Nodes - Type I</i>	<i>3</i>	<i>202.200,00</i>	<i>606.600,00</i>
<i>Reference Nodes - Type II</i>	<i>3</i>	<i>435.400,00</i>	<i>1.306.200,00</i>
<i>Municipality Nodes - Type I</i>	<i>1</i>	<i>202.200,00</i>	<i>202.200,00</i>
<i>Municipality Nodes - Type II</i>	<i>2</i>	<i>435.400,00</i>	<i>870.800,00</i>
<i>TOTAL ERDF - SPD 3.3 (I)</i>			<i>6.809.000,00</i>
<i>Physical planning pilot project in Municipalities</i>	<i>1</i>	<i>2.010.000,00</i>	<i>2.010.000,00</i>
<i>Adjusting GRDB10LT to interoperability requirements</i>	<i>1</i>	<i>4.939.800,00</i>	<i>4.939.800,00</i>
<i>EXTENSION of ERDF - SPD 3.3 (II)</i>			<i>6.949.800,00</i>
<i>E-Training programme (ESF - SPD 2.2)</i>	<i>1</i>	<i>1.539.960,00</i>	<i>1.539.960,00</i>
<i>E-Training infrastructure (ERDF - SPD 1.5)</i>	<i>1</i>	<i>604.700,00</i>	<i>604.700,00</i>
<i>TOTAL TRAINING</i>			<i>2.144.660,00</i>
<i>GRAND TOTAL LGII</i>			<i>15.903.460,00</i>

It is expected that the benefits by introducing the LGII will value around 15,65 m€/ annum. [\[30\]](#)

By 2005, the LGII activity is separated into three dependant projects:

1. Development of the LGII organisational framework, technical standards and harmonisation of available reference data;
2. Development of training materials for using of geographical information;
3. Development of necessary reference data for LGII.

The first project is in progress -an application was submitted to use EC structural funds and positively passed the evaluation, project agreement was signed in June 2005. The

timeframe for this project is three years. Budget is 17 mln Lithuanian Litas. Other two parts are under submission for funding and to be followed by outcomes from the first one.

NLS inserted a task for preparing and approving a regulation for the LGII in the strategic programme of government of Republic of Lithuania. The regulation is foreseen to be in compatibility with INSPIRE proposal for a Directive and is planned to be approved by the government in the end of 2006.

By the end of 2007, the LGII project had been further developed. The project will be completed in summer 2008. Also, the project on development of remote learning system for Geographical Information Infrastructure related activities was almost closed, spring 2008. The remote learning system consists of 9 educational modules for the total amount of 90 ECTS (European Credit Transfer System) credits, which is close to 1090 learning hours. 227 public servants from governmental institutions and municipalities participated in the remote learning activities. All remote educational material is available for public after the end of the project, and about 10 universities and colleges already incorporated the remote learning components to their study programmes for GIS related disciplines. The project website is - www.gismokymai.lt, but it is in Lithuanian only.

2 Details of NLS

2.1 General Information

The main responsibilities of the Cadastre and Geodesy Department within the NLS as GCCIS owner are in line with traditional NMA-mandates and are SDI-oriented, albeit in a top-down manner ([12]):

- To prepare long-term national mapping programs taking into account the needs of cartographic material for the land reform, national defence services, state cadastres, preparation of territory planning documents, sea and air transport navigation.
- To guide the activities of national cartography, management of the national geodetic background and developing geo-referential databases.
- To co-ordinate the activities related to the aerial photography and satellite image of the territory of the Republic of Lithuania.
- To prepare rules and standards for topographic, geodetic, cartographic and geo-referential databases.
- To prepare draft resolutions of the Government of the Republic of Lithuania related to its activity, the rules and standards, to ensure their harmonisation with the standards of the European Union and NATO.
- To co-ordinate and control the activities of enterprises, institutions and organisations in preparing geodetic, cartographic and geo-referential databases for the territory of the Republic of Lithuania, its continental shelf and the economic zone in the Baltic Sea, the international agreements, the

state and ministerial funds (excluding those of the Ministry of National Defence and the State Security Department).

- To collect and systemise the digital database of the state geodetic network, cartographic material and geo-referential data (except collected in counties and municipalities), to provide users with geodetic control networks (planimetric, levelling, gravimetric) and cartographic material, to prepare special geodetic and cartographic material ordered by state institutions and provide it to them.
- To prepare cartographic and designing research material that is necessary for the land reform, state land surveying and state land cadastre activities and for registration of land and other real property.
- To prepare the material to issue the licences to carry geodetic and topographic works, to be engaged in the preparation, publishing and printing of topographic and thematic plans and maps, cartographic schemas. To supervise the performance of licensed activity.
- To protect copyrights to the geodetic and cartographic production (including digital one).
- To co-ordinate the activity of the county manager's administrations, municipal services and specialists organising and carrying out geodetic and cartographic activity in counties.
- Within the competence and in the defined manner to keep relations with relevant institutions of foreign countries and international organisations and represent the National Land Service therein, to prepare drafts of international agreements in the manner prescribed by laws and organise their implementation.
- To create a strategy for development, maintenance and update of geographic information systems (GIS), cadastres and other information systems as well as for the real property cadastre activities.
- To organise the development and maintenance of the land information system for the Lithuanian territory, the graphical database of land parcels registration and identification system, the development and maintenance of the real property cadastre database as well as the compilation and updating of geo-referential databases M 1:500 - M 1:50.000. To prepare mapping programs 1:500 - 1:50.000 for urban areas.
- To co-ordinate the formation of real property cadastre objects, the statistics of state-owned land according to land use categories and cadastral indices, land valuation activities and supervise them. To co-ordinate the standardisation and harmonisation of the cadastres and information systems with the geo-referential databases.
- To draft the rules and standards for GIS, cadastres and information systems and geo-referential databases M 1:500 - M 1:50.000 and the methods and

technical regulation drafts for digitising of analogue topographic map sheets and define data use conditions.

- To provide methodical guidance to county manager's administrations and municipalities in developing GIS, cadastres and other information systems and geo-referenced databases, to take care of improving the qualification skills of GIS and cadastre specialists.
- To prepare the plans for developing information systems of GIS, cadastres and other geographically oriented information systems funded from the national budget of the Republic of Lithuania as well as for accounting of the real property cadastre and land and supervise their implementation.
- To take part in organising and co-ordinating foreign technical and humanitarian support programs by preparing prospective projects. To prepare drafts of legal acts and international agreements.
- To provide users with the information on GIS, cadastres and other information systems that is necessary for national statistics of land, for cadastres, monitoring, registers and other needs of the state.

The GCIS (The National Geodetic Control Information System) was designed and developed according to the "Program for developing a Geodetic Control Information System" which was confirmed by State Geodetic Service in 1995. At present time GCIS has extended to the **Geodetic and Cartographic Control Information System (GCCIS)**.

- The initiative is hosted and supervised by NLS. [\[1\]](#)
- The main contractor of the project and designer of the Web pages was company AB "ALNA" (<http://www.alna.lt>). This is now the National Centre of Remote Sensing and Geoinformatics.
- A role is also played by the State Enterprise GIS-Centras. GIS-Centras (National Centre of Remote Sensing and Geoinformatics). Its main tasks are (1) digital cartography and geoinformatics; (2) creating and filling up of the GIS data bases; (3) projection and installation of the GIS and surveying software, (4) creation of maps for different regions and towns of Lithuania, special maps, plans and drafts, (5) teaching and consultations. However, its effective relationship with GCCIS remains to be clarified.

[\[10\]](#) , [\[4\]](#) , [\[17\]](#)

Under the management of the Ministry of Agriculture the NLS has the supervision of LGII. The main goal of the NLS is to form and ensure the implementation of the state policy in the areas of land management and administration, real property cadastre, geodesy, cartography and development of georeference base data.

Clear and definite legislation of activities in these areas is one of the most important tasks for the National Land Service as a governmental institution.

NLS provides national georeference base and thematic data that meanwhile comprise the major part of LGII resources.

2.2 Component 1: Coordination and organizational issues

In 2005, a project towards a Lithuanian Geographic Information Infrastructure was started. The main aim of LGII - Lithuanian Geographic Information Infrastructure is to develop an official Geographic Information source system or Infrastructure and Information Environment allowing the free incorporation of GI into almost any Public Sector Information (PSI) Services (Annual Report National Land Survey 2005, http://www.nzt.lt/failai/NLS-LT_2005Annual_report.pdf). The project run for three years, is led by GISCentras and involved 11 public authorities in the first stage. The budget is approximately 5 million € and the project is overseen by the ministry of environment, the ministry of justice, the ministry of environment and the ministry of transport and communication, who are gathered in a Coordination Board. Four stages are foreseen: a facility study; the development of a framework, standards and harmonization (2005-2008); knowledge development and remote learning (2006-2008); and developing reference data and services (2007-2010) (see http://www.nzt.lt/failai/Urbanas_GMES_LGII20060512.pps).

The objectives of the LGII are to:

- provide GI (as part of PSI), prime digital material for almost any public sector information services, research, business and citizens at large – GI availability via the Internet
- combine/interconnect the GI prime material data into different sources of added value electronic public sector products and services, hence leads to unprecedented possibilities to interconnect various register, databases, etc. – Interoperability
- Foster substantial investment in creativity and innovation, and lead in turn to growth and increased competitiveness in both content provision and Information Technology and more generally across a wide range of industrial and cultural sectors. This will safeguard employment and encourage new job creation - Economic gain (Annual Report National Land Survey 2005, http://www.nzt.lt/failai/NLS-LT_2005Annual_report.pdf).

Besides NLS, main actors are the Cadastral Agency and the Ministry of Environment. Although these institutions are in the process of developing significant SDI-like building blocks, there is no(t yet) evidence of structured co-ordination among them. What is clear, is a strengthened cooperation between MoE and NLS. There is also a trend to establish a Council on SDI which should take this coordinating role.

The cooperation is further developed through agreements between partners of the LGII, mainly for the maintenance of some of the geographic data sets: between NLS and EA for common hydrographic features, between NLS and the Forestry Service for common forest features, between NLS and the Road Authority for the common road objects and between NLS and municipalities for developing local GIS.

The specific coordinating body established to implement INSPIRE is the LGII project partners Consortia. It is composed from National Land Service, SE “GIS-Centras”, SE Centre of Registers, Environmental Protection Agency, Lithuanian Geological Survey, State Forest Survey Service, State Protected Areas Service, Fire and Rescue Department, Lithuanian Road Administration and Vilnius Municipality, with National Land Service taking the lead.

The coordinating structure (NSDI Coordinating Board, composed by the representatives of Ministries) is foreseen to be established as soon as changes of the law on Geodesy & Cartography will be in force.

The Ministry of Agriculture and National Land Service under the Ministry of Agriculture (NLS) are responsible for a strategy implementing INSPIRE in Lithuania. There are some internal planning documents, which are used for communication to state data stakeholders and responsible authorities, but those documents are not approved as legal acts.

Moreover, there is a plan for demand of projects implementing INSPIRE in Lithuania. According to the plan two projects will be launched in 2010:

- 1) improving the NSDI geoportal functionality and arranging INSPIRE associated e-services, and
- 2) linking large scale spatial data producers (municipalities) to the NSDI chain.

Also a number of planning documents (Vision, Business Plan, Administration model, Implementation methodology, etc) were produced in regard to implementing NSDI by the project on development of Lithuanian Geographic Information Infrastructure (LGII), which was completed at December 2008.

2.2.1 Conclusions of Component 1

The Lithuanian SDI approach is truly national. SDI building blocks have reached a significant level of operability. The specific coordinating body established to implement INSPIRE is the LGII project partners Consortia. It is composed from National Land Service, SE “GIS-Centras”, SE Centre of Registers, Environmental Protection Agency, Lithuanian Geological Survey, State Forest Survey Service, State Protected Areas Service, Fire and Rescue Department, Lithuanian Road Administration and Vilnius Municipality, with National Land Service taking the lead. The Ministry of Agriculture and National Land Service under the Ministry of Agriculture (NLS) are responsible for a strategy implementing INSPIRE in Lithuania.

Based on these conclusions we score the indicators as follows:

- The approach and territorial coverage of the SDI is truly national

- One or more components of the SDI have reached a significant level of operationality (3)
- The officially recognised or de facto coordinating body of the SDI is a NDP, i.e. a NMA or a comparable organisation
- The officially recognised or de facto coordinating body for the SDI is an organisation controlled by data users (No)
- An organisation of the type ‘national GI-association’ is involved in the coordination of the SDI (No)
- Producers and users of spatial data are participating in the SDI (No)
- Only public sector actors are participating in the SDI

2.3 Component 2: Legal framework and funding

[4], [11], [24], [25] – [27]

2.3.1 Legal framework

Since the mid-90s, there have been significant developments to develop a legal framework related to GI, including e.g. legislation establishing the registers on land and property (1996) and the responsibilities of NSGC (1997); legislation on the State registers (1996) and the population census (1997).

[1]

A milestone for the development of GIS in Lithuania was the “Law on Geodesy and Cartography” which was adopted in 2001. The purpose of this law is to regulate the management of geodetic, topographic, and cartographic activities; the principles of creating databases of the GI systems and their integrity; the ownership of the geodetic control and cartographic material; and the main rights and duties of state and municipal institutions and enterprises involved in map production, geodetic survey, gathering of data, its record keeping, and use, in the field of geodesy and cartography.

A draft is currently being prepared for a new Law on Geodesy and Cartography, which will include the transposition of the INSPIRE directive and of Directive 2006/123/EC on services in the internal market. The new law will contain a definition of the Lithuanian SDI, and will regulate public access to geographic data and services (unless other legislation applies). (see Saulius Urbanas, ‘Step Forward Practically Implementing National Spatial Data Infrastructure in Lithuania’, ftp://ftp.hnit-baltic.lt/public/outgoing/EUC.../SDI_Urbanas_Saulius.pdf).

2.3.2 Public-private partnerships (PPPs)

There are no real PPPs. Private companies play a role in the GCCIS.

[10]

2.3.3 Policy and legislation on access to and re-use of public sector information (PSI)

[2]

On 2 July 1996 the Law on the Provision of Information to the Public (no. I-1418) was passed. The latest amendment to this law was made in July 2006 (http://www.rtk.lt/en/static_old.php?strid=27410&). Article 6 of this law states that “Every individual shall have the right to obtain from State and local authority institutions and agencies and other budgetary institutions, public information regarding their activities, their official documents (copies), as well as private information about himself” and “State and local government institutions must, in accordance with the procedure established by the Law On the Right to Obtain Information from State and Local Government Institutions and other laws, furnish public information as well as private information held by them, except in instances specified by laws, when private information is not to be divulged.”

A new version on the Law on State Registers has been in force since August 2004. The state registers are an important part of official public information. Currently the Law covers more than 90 databases. In the near future this number of registers could increase to around 160. The law on State Registers defines the order of establishing, creation, managing, liquidation and distribution of the state registers. All data of the state registers are public and available for any citizen or legal person if it is not restricted by other specific laws. The data are available via Internet or could be downloaded by data flow channels. There is no standard license. The details of the distribution of the data of every register are described in the regulations of the register adopted by a Government Decree. The list of registers is available at www.registrai.lt. [29]

Lithuania has transposed Directive 2003/4 on access to environmental information. Directive 2003/98 was transposed by the law of 10 November 2005 on Obtaining Information from Central and Local Government Institutions (Nr. X-383 of 10 November 2005). The law concerns the right of private companies and citizens to obtain information from central and local government and the re-use of it. The law defines the rights and modalities to use the information resources of public sector and also determines the obligation of central and local government to provide this kind of information to all concerned (http://europa.eu.int/information_society/policy/psi/actions_ms/implementation/index_en.htm#lithuania).

2.3.4 Legal protection of GI by intellectual property rights

The Law on Copyright and Related Rights (Act no. VIII-1185) was enacted on 18 May 1999, entering into force on 9 June 1999 (amendments were introduced by the Act of 20 July 2000 - no. VIII-1886). The Copyright Act was a major step forward for the legal regime in Lithuania. It was drafted taking into consideration the EU directives and provisions of the Bern and Geneva Conventions. In the last eight years Lithuania has transformed its copyright law from the old Soviet-style one to a system that complies to a large extent with modern bilateral and multilateral standards. Chapter 4 of the Copyright Law contains special provisions on the legal protection of databases (sui generis right). The 2001 directive on copyright in the information society has been incorporated in Lithuanian legislation.

Article 34 of the recent Law on Geodesy and Cartography of June 2001 contains special provisions regarding the copyright protection of GI. This article stipulates the following:

“The Republic of Lithuania shall be the copyright holder of the exclusive economic rights to official maps and digital databases financed from the state budget and foreign assistance for the Republic of Lithuania. The authorised institution shall, within the limits of its competence, administer the exclusive economic rights of the authors to official maps and georeferenced databases.

The municipalities shall be the copyright holders of the exclusive economic rights of the authors to topographic maps, plans and georeferenced databases financed from the municipal budgets and shall, within the limits of their competence, administer the exclusive economic rights of the authors.

For the use of official maps and georeferenced databases, publishing of thematic maps or development of institutional digital databases, with the exception of their use for defence needs, an author's fee shall be charged and a copyright licensing agreement shall be made with the user. The remuneration received as the author's fee shall be used for adjustment of official maps and georeferenced databases. The rights to cartographic works, thematic and other maps and databases shall be protected following the procedure under law.

Original works of thematic cartography shall be regarded as research work and their publication shall be recognised as scientific publications.”

Closely linked to article 34 are the stipulations made in article 7 on the ownership of geodetic, topographic and cartographic materials.

Article 35 stipulates with regard to the procedure on the use of geodetic, topographic and cartographic materials:

“Geodetic, topographic and cartographic materials and georeferenced data shall be public and available to any natural and legal persons and enterprises without the status of a legal person. The authorised institution and executive institutions of the municipalities shall provide to the consumers geodetic, topographic and cartographic

materials and georeferenced data following the procedure established by the authorised institution and executive institutions of the municipalities. Fees for the materials and data shall be charged in the manner stipulated by laws.”

One of the functions of the Cadastre and Geodesy Department of the NLS is to protect the copyright of the geodetic and cartographic production (including digital ones).

[7]

[6]

The copyright of digital orthophotos belongs to SSC Satellitbild (private agency SE).

2.3.5 Restricted access to GI further to the legal protection of privacy

Lithuania enacted its Law on Legal Protection of Personal Data in 1996. This law has been amended several times throughout the years. The latest amendment dates from 22 January 2002, as to ensure the compliance of the act with the EU Directives on data protection. The full text of this law can be consulted on the following website: <http://www.ada.lt/en/docs/lawlegalprot.htm>. Lithuania is currently in the process of preparing for membership of the EU and has a National Programme for the Adoption of EU Regulations. Directive 2002/58 on privacy and electronic communications still has been transferred into national law.

[2]

The Law on the Public Registers of 13 August 1996 (no. I-1490) determines the rights and duties of the institutions responsible for the management of public registers, the institutions directing their activities and exercising supervision over them, the rights and duties of the legal and natural persons providing data to the public registers as well as using the data of public registers, and the protection of these rights. It also determines the rights and duties of legal and natural persons whose data constitutes the object of the public registers and the protection of said rights.

2.3.6 Licensing framework

The Law on Geodesy and Cartography of June 2001 lists a number of geodetic, topographic and cartographic activities that should be carried out. These activities are subject to licensing, and the licences for these activities shall be issued by the NLS. The NLS arranges the concession of licences for cadastral survey products, topography, geodesy and cartography activities. It administers the funds provided for these purposes.

[2]

On the geoportal, datasets are available under a licensing policy that allows a large part of the procedure to be performed in an automated way. (see http://www.geoportal.lt/wps/portal!/ut/p/c0/04_SB8K8xLLM9MSSzPy8xBz9CP0os_gA

[QwNnc09LYwP_MAs3A8_gYONAI4AQI3dfA_2CbEdFACRaNbw!/?WCM_PORTLET=PC_7_P10C7I930OV8F0ISS3QDPT2GM3_WCM&WCM_GLOBAL_CONTEXT=/wps/wcm/connect/lgii-en/sa-portal/sa-methodical-information/sa-tech-document/doc-en-method_gp](http://www.geoportal.lt/wps/portal!/ut/p/c0/04_SB8K8xLLM9MSSzPy8xBz9CP0os_gAQwNnc09LYwP_MAs3A8_gYONAI4AQI3dfA_2CbEdFACRaNbw!/?WCM_PORTLET=PC_7_P10C7I930OV8F0ISS3QDPT2GM3_WCM&WCM_GLOBAL_CONTEXT=/wps/wcm/connect/lgii-en/sa-portal/sa-methodical-information/sa-tech-document/doc-en-method_gp)). Discussions are ongoing to add data from other public authorities to the geoportal. Standard agreements and licences have been developed for different groups of stakeholders, with a description of the use conditions.

2.3.7 Funding model for SDI and pricing policy

Funding

The sources of public funding are the authorities at national (= SDI) level. However, funding does not only come from the state budget, but also from EU funding opportunities, EU structural funds and EU regional funds, in accordance with article 22 of the Law on Geodesy and Cartography. Activities that fall within the competence of the local authorities have to be funded from the state budget, the local authorities' budget and other resources.

Pricing

Based on the Law of Registers all public authorities shall exchange data between State registers free of charge. This principle at most cases applies to public databases for public use also, so for example NLS doesn't charge any governmental body (and municipalities) for the use of state spatial products.

For other use of the data sets available on the geoportal, a pricing policy was developed based on a number of parameters: data type (raster/vector data sets, Web service); the method of selection of territory by the user (select map sheets, draw territories); rateable unit (map sheet, sq.km, click, period of time etc.); payment terms (after expiry of the license, before data production, periodically). In addition, the price also depends on the size of the selected territory, the number of selected map sheets, the number of clicks, the number of users, the licensing period etc. (see http://www.geoportal.lt/wps/portal!/ut/p/c0/04_SB8K8xLLM9MSSzPy8xBz9CP0os_gAQwNnc09LYwP_MAs3A8_gYONAI4AQI3dfA_2CbEdFACRaNbw!/?WCM_PORTLET=PC_7_P10C7I930OV8F0ISS3QDPT2GM3_WCM&WCM_GLOBAL_CONTEXT=/wps/wcm/connect/lgii-en/sa-portal/sa-methodical-information/sa-tech-document/doc-en-method_gp)

2.3.8 Conclusions of Component 2

Lithuanian geographic information infrastructure (LGII) has been designed as an open, shared national spatial data infrastructure for accessing and distributing geographic information products and services online. It connects major public sector information sources through a single Internet portal (www.geoportal.lt) that has been launched in 2008. A draft is currently being prepared for a new Law on Geodesy and Cartography, which will include the transposition of the INSPIRE directive and of Directive 2006/123/EC on services in the internal market. The new law will contain a definition of

the Lithuanian SDI, and will regulate public access to geographic data and services. On the geoportal, datasets are available under a licensing policy that allows a large part of the procedure to be performed in an automated way. For other use of the data sets available on the geoportal, a pricing policy was developed based on a number of parameters. The sources of public funding are the authorities at national (= SDI) level. However, funding does not only come from the state budget, but also from EU funding opportunities, EU structural funds and EU regional funds, in accordance with article 22 of the Law on Geodesy and Cartography. Activities that fall within the competence of the local authorities have to be funded from the state budget, the local authorities' budget and other resources.

Based on these conclusions we score the indicators as follows:

- There is a legal instrument or framework determining the SDI-strategy or – development
- There are true PPP's or other co-financing mechanisms between public and private sector bodies with respect to the development and operation of the SDI-related projects (No)
- There is a freedom of information (FOI) act which contains specific FOI legislation for the GI-sector (In Preparation)
- GI can specifically be protected by copyright
- Privacy laws are actively being taken into account by the holders of GI (No Information found)
- There is a framework or policy for sharing GI between public institutions (In Preparation)
- There are simplified and standardised licences for personal use (In Preparation)
- The long-term financial security of the SDI-initiative is secured (Partially)
- There is a pricing framework for trading, using and/or commercialising GI

2.4 Component 3: Data for themes of the INSPIRE annexes

2.4.1 Scale and resolution: European, National, Regional, Local, Other

The GCCIS-initiative of NLS support topographical data national (1:200.000), regional (1:100.000 and 1:50.000) and local scale (1:20.000) levels (<http://www.gkpi.lt/gkpiweb/Databases/%C5%BDem%C4%97lapi%C5%B3ZMDB/ZMDBstrukt%C5%ABra/tabid/78/Default.aspx>):

[15]

GI at the European scale is produced for the territory of Lithuania as part of Baltic Sea Region Map-project

[1]

2.4.2 Data by resolution or scale range for the INSPIRE themes

In March 2008, the Lithuanian authorities provided the data sets template filled for most of the Lithuanian stakeholders. Regarding the three INSPIRE annexes addressing the 34 spatial data themes Lithuania is providing discovery and view services for a significant part of them while a number of them can be also downloaded. All metadata are based on ISO. The datasets are provided in a variety of scales and resolution according to their usage. A complete list will be presented in the updated report including the information provided by the country in 2010.

2.4.3 Geodetic reference systems and projections

The Lithuanian Coordinate System 1994 based is on the geodetic datum ETRS89 [16]

[7]

The projection system is Transverse Mercator (conformal transverse cylindrical projection), central meridian 24°E, and scale factor 0.9998 at 24°).

[14] [16] [7]

For satellite data the ellipsoid GRS80 is used

[7]

For mapping on national, regional and local level, the Lithuanian Coordinate System 1994 is used (same for EE, LT). Major scales are 1:200.000; 1:100.000; 1:50.000; 1:10.000 and 1:5.000.

[18]

Algorithms for conversion of coordinates to ETRS89 are available for coordinate systems which are available in Lithuania and for calculation of geoid heights in the Lithuanian area.

2.4.4 Quality of the data

The spatial referencing is done based on

- Planimetric control database (GPS points, triangulation points, polygonometry points);
- Heights control database (benchmarks);
- Gravimetric control database (gravimetric points);
- Mapping areas database;
- Maps database (catalogue of printed maps of different scales and datum)
- Photogrammetry areas database;
- Photo images database (catalogue of aerial and satellite images)
- Archive database (catalogue of documents, kept in the Archive of NLS)

[\[16\]](#)

For quality checking, a module in MDL creates a special report file according to the queries made by Lithuanian users

[\[17\]](#)

2.4.5 Interoperability

As GIS software, mainly ARC/INFO is used.

[\[7\]](#)

Data is delivered in ARC/INFO or ARC/INFO.E00 or ArcView .SHP format, but can be converted or transferred in other formats.

[\[7\]](#)

[\[6\]](#)

Orthophotos 1:10 000 are available in TIFF format.

[\[8\]](#)

The LGII feasibility study is underlining the importance of interoperability:

In order to have a successful implementation of common universal interoperable data exchange standard, the guidelines and tools of Web Services Interoperability Organisation (WS-I)² should be respected and used. These guidelines define HTTP protocol for transport over Internet, SOAP (Simple Object Access Protocol) for data enveloping and the XML/GML protocol for data body. This architecture allows full interoperability between different implementations of Information Systems at the organisations.

For the interoperability of geographic data, the GML protocol should be considered. The data stream in GML format can be transferred using web services, particularly SOAP – Simple Object Access Protocol. It is a natural RPC – Remote Procedure Call protocol that is used to execute a piece of code (program, procedure) on a remote machine (server) and to receive its response (data). SOAP is the most suitable for this project because it works over (above, using) HTTP and/or HTTPS (HTTP Secure) protocols. This means that SOAP service is reachable and available everywhere.

[\[30\]](#)

2.4.6 Language and culture

Metadata is provided in Lithuanian. Accompanying documents are available in Lithuanian and partly in English.

[\[17\]](#)

2.4.7 Data Content

No information has been found.

2.4.8 Geographical names

Geographical names are managed in Lithuanian with original information on the names of the places. No secondary name sets are used.

[\[17\]](#)

[\[7\]](#)

[\[23\]](#)

2.4.9 Conclusions of Component 3

² Web Services Interoperability Organization: see <http://www.ws-i.org>

Already from the previous LT's SoP report Geodatasets existed which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components while the geodetic reference system and projection systems are standardised, documented and interconvertable. The INSPIRE 2010 MR confirms the statement. 100 data sets have been reported (38, 23 and 39 to Annex I, II and III respectively). Algorithms for conversion of coordinates to ETRS89 are available for coordinate systems which are available in Lithuania and for calculation of geoid heights in the Lithuanian area. The LGII feasibility study is underlining the importance of interoperability. Metadata is provided in Lithuanian. Accompanying documents are available in Lithuanian and partly in English.

Based on these conclusions we score the indicators as follows:

- Geodatasets exist which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components
- The geodetic reference system and projection systems are standardised, documented and interconvertable
- There is a documented data quality control procedure applied at the level of the SDI (Partially)
- Concern for interoperability goes beyond conversion between different data formats (Partially)
- The national language is the operational language of the SDI
- English is used as secondary language (Partially)

2.5 Component 4: Metadata

2.5.1 Availability

Discovery metadata seem to be available for a significant part of the reference and core thematic geodatasets.

[\[16\]](#)

On the geoportal 15 metadata sets can be found on:

- Data of Geodetic and Cartographic Control Information System

- Digital Raster Data of the Lithuanian Topographic Map TOP50LKS-SRP at scale 1:50000 in the LKS-94 coordinate system
- Digital Raster Orthophotographic Map of County Centres of the Republic of Lithuania ORT2LT at scale 1:2000
- Monitoring areas for surface water
- Lithuanian Digital Raster Orthophotographic Map ORT10LT at Scale 1:10000 (2005-2006, colour)
- Lithuanian territory national cartography areas
- The Georeference Data Base of Settlements of the Republic of Lithuania GDB5LT at Scale 1:5 000
- WFS. Data of Geodetic and Cartographic Control Information System
- WFS. Lithuanian Geoinformation Data Base of Settlements at scale 1:5 000 (GDB5LT)
- WFS. Monitoring areas of surface water
- WMS. Data of Geodetic and Cartographic Control Information System
- WMS. Digital Orthophotograph Map of County Centres of Lithuania at scale 1:2 000 (ORT2LT)
- WMS. Digital Raster Data of the Lithuanian Topographic Map TOP50LKS-SRP at scale 1:50000 in the LKS-94 coordinate system
- WMS. Digital orthophotograph Map of Lithuania at scale 1:10000 (2005-2006, colour)
- WMS. Lithuanian Geoinformation Data Base of Settlements at the scale 1: 5 000 (GDB5LT)

2.5.2 Metadata catalogues availability + standard

National metadata system is centralized in the LGII geoportal. Metadata are collected from various sources and stored in a single database maintained by the state enterprise “GIS-Centras”.

Geographic data providers have to prepare metadata using National Metadata Profile corresponding to ISO 19115 (Geographic information – Metadata) and to ISO 19119 (Geographic information – services) standards. LGII metadata editor is based on ISO 19139 (Geographic information – Metadata – XML schema implementation) standard.

Metadata can be submitted to Geoportal in one of three ways:

- a) Manually entering information using online metadata editor application;
- b) Uploading XML file directly using online interface of LGII metadata system;
- c) By harvesting (automated procedure that connects directly to providers' database and reads metadata file that is copied over old metadata file identified by the same unique identifier).

Updates of metadata depend on data resource and are performed by the data provider.

Metadata editor has integrated tools for metadata core element validation. After initial automated validation procedure metadata administrator checks metadata for semantic correctness and approves or rejects it correspondingly.

The user can access metadata searching for geographic data at the portal. Numerous search parameters, such as provider, data theme, and territory or time period can be used. Once geographic data product is discovered, the user is given options to browse short summary or full metadata for that product. Metadata can be included in a list for comparison.

Metadata are provided free of charge and publicly. For specific cases, there is a possibility for data provider to limit metadata access to particular users' groups.

As for metadata encoding, XML is generally the preferred option. For structuring XML metadata, an FGDC Metadata DTD (Document Type Definition) is. In fact, metadata collections with other data structures can still support interoperable catalogue searching. By mapping their internal data fields to those of Z39.50's GEO profile, a variety of metadata collections can support LGII Portal queries.

OGC's Catalog Interface Implementation Specification defines an SQL-like Common Query Language for search and retrieval of metadata, along with profiles of it for the OLEDB, CORBA, and Web computing environments. The Web profile uses the ANSI/NISO Z39.50 (ISO 23950) protocol, either on its own Internet port, or via HTTP using XML-encoded requests.

[\[30\]](#)

2.5.3 Dublin core metadata standards for GI-discovery

Not applicable

2.5.4 Metadata implementation

No information has been found.

2.5.5 Conclusions of Component 4

Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes. The 2010 MR reveals that for the reported datasets of INSPIRE (87%

of the data sets have metadata). National metadata system is centralized in the LGII geoportal. Metadata are collected from various sources and stored in a single database maintained by the state enterprise “GIS-Centras”. Geographic data providers have to prepare metadata using National Metadata Profile corresponding to ISO 19115. Updates of metadata depend on data resource and are performed by the data provider.

Based on these conclusions we score the indicators as follows:

- Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes
- One or more standardised metadata catalogues are available covering more than one data producing agency
- There is a coordinating authority for metadata implementation at the level of the SDI (Partially)

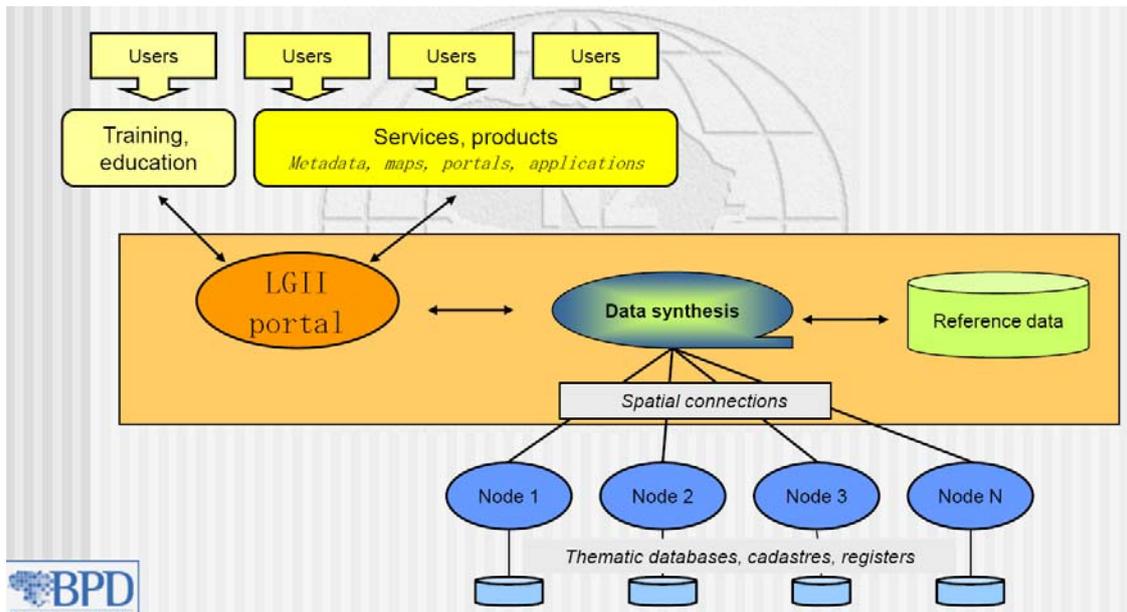
2.6 Component 5: Network Services

The NLS and GIS-Centras asked HNT-BALTIC, an ESRI® GIS software supplier, to develop the Lithuanian Geographic Information Infrastructure (LGII) central web portal system based on FME technology (<http://www.geoportal.lt>)

Arranged in a distributed environment in GIS-Centras, the LGII’s central spatial node seamlessly connects nine diverse public agencies and one municipality’s remote GIS nodes. Users securely access the LGII portal, select their desired area from a map view, and choose the data layers they need, and specify their particular GIS output parameters by selecting from the 18 different data formats and 10 coordinate systems commonly required. Based on their data selection, FME automatically requests data from one or more of the connected data providers compiles the selected data layers and exports them into the requested format. Users then receive an email with a link to the data for them to securely download at their convenience.

As FME handles all data conversions automatically, data providers can upload new datasets or data updates into their existing databases and the software stores them to the right nodes of the shared server database in the right coordinate system.

The flow of Geographical Information Infrastructure is depicted in figure 1 (Urbanas, 2009).



The users can use the geoportal to:

- Browse maps
- Find information about available geographic data and services ([Search](#))
- Use the Glossary of geographic information terms ([GIS-Glossary](#))
- Participate in thematic geographic information communities (Communities)
- Participate in the discussion forum
- Order and purchase online data products and services (registered users)
- Publish geographic data and services (organisations)

The national geoportal is under development. Currently there are 67 datasets discovered, no real time viewing is arranged, users can see samples only. Hence 43 WMS, 19 WFS and 1 WCS services are up and running.

The funding as a part of National Land Service budget is planned for 2010 for establishing the national geoportal and is in the order of 250.000 Euros.

On the next page an overview of services and their characteristics are given. However, the reference IDs given are mostly links to geo-portals and not directly to the services.

2.6.1 On-line access service for metadata: discovery services

There are on-line access services for the metadata.

[\[17\]](#)

Services						
Service ³	Organisation responsible	Type of service ⁴	Metadata (N/Y/ISO) ⁵	Open for Public (Y/N)	Free/Not free ⁶ (Y/N)	
Geodetic Control Information System http://www.gis-centras.lt/gkpis	National Land Service under the Ministry of Agriculture www.nzt.lt	View, download	N	Y	N	
Register of Addresses http://www.registrucentras.lt/adr/	SE Centre of Registers www.registrucentras.lt	View, download	Y	Y	N	
Real Estate Cadastre http://www.registrucentras.lt/adr/	SE Centre of Registers www.registrucentras.lt	View, download	Y	Y	N	
Geological Information System GEOLIS	Lithuanian Geological Survey under the Ministry of Environment www.lgt.lt	View, download	Y	Y	N	
State Cadastre of Protected Areas http://stk.vstt.lt/stk	State Service for Protected Areas under the Ministry of Environment www.vstt.lt	View, download	Y	Y	Y	

³ List the names/IDs and where possible the link (URL) of all the discover, view, download, transformation and invoking services that are part of your infrastructure

⁴ Indicate the type (discover, view, download, transformation and invoking services)

⁵ Indicate whether the service has no metadata (N), or metadata according to ISO 19119 (ISO).

⁶ Whether or not the service is free for use.

2.6.2 On-line access service for data: download services

There are on-line access services planned for reference data and core thematic data but not yet operational.

Data at LGII portal can be provided as two types of geoproducts: as a downloadable dataset and as an OGC Web service (WMS, WFS, and WCS). Accordingly geoproducts can be ordered by a user as a copy or as an online data flow.

LGII business model describes exchange of geoproducts at LGII portal taking into account existing pricing and licensing practices. The model allows flexible configuration of geoproduct parameters by data providers. The parameters are standardized and clearly described as to reflect the specifics and limitations of geoproduct use. The pricing is based on 9 basic geoproduct types that differ depending on data type (raster/vector data sets, Web service), on the method of selection of territory by the user (select map sheets, draw territories), on rateable unit (map sheet, sq.km, period of time etc.) and on payment terms (after expiry of the license, before data production, periodically).

In addition, price can be influenced by actual size of selected territory, number of selected map sheets, number of clicks, number of users, licensing period etc. With reference to business model there are implemented flexible licences and their confirmation possibilities in geoportal. According to purposes of data use the data provider may choose suitable texts of license and possibilities of geoproduct's license confirmation (physical signature; electronic signature; agree with license in geoportal after proved identity; agree with license in geoportal).

2.6.3 Inter-linkages of on-line access services for metadata data

Not applicable.

2.6.4 OpenSource software and access services

No information has been found.

2.6.5 Availability of viewing service(s)

Viewing of GCCIS-data on it webmap browsers. Two versions for register and unregistered users exist (in Lithuanian) available at: <http://www.gkpis.lt/%C5%BDem%C4%97lapis/tabid/89/Default.aspx>

2.6.6 Availability of catalogue services to regulate access

No information has been found.

2.6.7 Availability of catalogue services that perform payment operations

No information has been found.

2.6.8 Availability of catalogue services to extract and send data to a user application

No information has been found.

2.6.9 SDI user applications

No information has been found.

2.6.10 Availability of geo-processing services

Map, feature and coordinate transformation services are planned. For a web pricing and ordering service, a contract is prepared to agree with National Land Service.

[\[17\]](#)

[\[7\]](#)

2.6.11 Conclusions of Component 5

The national geoportal is under development. Currently there are 67 datasets discovered, no real time viewing is arranged, users can see samples only. Hence 43 WMS, 19 WFS and 1 WCS services are up and running. Data at LGII portal can be provided as two types of geoproducts: as a downloadable dataset and as an OGC Web service (WMS, WFS, and WCS). Accordingly geoproducts can be ordered by a user as a copy or as an online data flow

Based on these conclusions we score the indicators as follows:

- There are one or more discovery services making it possible to search for data and services through metadata (Not so clear)
- There are one or more view services available for to visualise data from the themes of the INSPIRE annexes
- There are one ore more on-line download services enabling (parts of) copies of datasets (Not so clear)
- There are one or more transformation services enabling spatial datasets to be transformed to achieve interoperability (No information found)

- There are middleware services allowing data services to be invoked (No information found)

2.7 Component 6: Thematic environmental data

Under the LGII and the supply of geoportal data, the Environmental Protection Agency (under the Ministry of Environment) collects data on use of water resources, discharges of waste water, waste generation and treatment, pollution of ambient air and surface water. It also manages and develops State Cadastre of Rivers, lakes and reservoirs, classifiers of Rivers, lakes and reservoirs of the Republic of Lithuania. Cadastre of Rivers, lakes and reservoirs of Lithuania has been re-designed as a part of the Environment Protection Agency node. It creates a convenient environment for integrated management of water resources in Lithuania, orientated to river basins' territories.

There will be connections between the cadastre information system and other systems of this node that together will make up an integral Surface water resources' geographic information system.

Data exchange and metadata management tools have been designed to facilitate information sharing between the Surface water resources' GIS and other registers/cadastrals managed by the LGII project partners.

The Lithuanian Geological Survey, State Forest Survey Service and State Protected Areas Service under the Ministry of Environment will provide data from Geological information system, containing information on boreholes, underground resources, potential contamination sources, excavations, geological processes and phenomena, geochemistry and hydrochemistry, groundwater monitoring, stratigraphy and lithology and geotopes, modernized Forestry cadastre information system and comprehensive information on Protected areas of Lithuania.

2.7.1 Conclusions of Component 6

Datasets exist for several themes (MR 2010). Under the LGII and the supply of geoportal data, the Environmental Protection Agency collects data on use of water resources. Similarly other institutions provide their data.

Based on the information provided on the previous paragraph we score the indicator as follows:

- Thematic environmental data are covered by the described SDI-initiative or there is an independent thematic environmental SDI

2.8 Standards

The National Metadata Profile corresponds to ISO 19115 (Geographic information – Metadata) and to ISO 19119 (Geographic information – services) standards.

The LGII metadata editor is based on ISO 19139 (Geographic information – Metadata – XML schema implementation) standards.

2.8.1 Conclusions of Component 7

Standards are partially used. For example, the National Metadata Profile corresponds to ISO 19115 (Geographic information – Metadata) and to ISO 19119 (Geographic information – services) standards. The LGII metadata editor is based on ISO 19139 (Geographic information – Metadata – XML schema implementation) standards.

Based on these conclusions we score the indicator as follows:

- The SDI-initiative is devoting significant attention to standardisation issues (Partially)

2.9 Use and efficiency of the SDI

The Fire and Rescue Department under the Ministry of Interior is assigned to manage, regulate and coordinate the state civil protection and rescue system in the country, to organize fire and civil protection. It administers the register of establishments of the state significance and dangerous objects that will become available to state institutions, economic entities and population through LGII portal.

The Lithuanian Road Administration under the Ministry of Transport and Communications is an enterprise in charge of organizing and co-ordinating the reconstruction, maintenance and development of the roads of national significance. Lithuanian Road Administration aims to achieve that the transport on the roads of national significance would be safe, fast, convenient and environment-friendly. Interoperable data on Lithuanian roads, bridges and viaducts will be available for route finding and planning, spatial analysis and decision making through the LGII geoportal.

3 Annexes

3.1 List of SDI addresses / contacts for Lithuania

Table: SDI contact list			
	Web address	Organisational mailing address	Over-all contact person: Tel./fax/e-mail
National			
National Land service under the Ministry of Agriculture of the Republic of Lithuania	http://www.nzt.lt	Gedimino pr. 19 LT-01103 Vilnius	Director General: Kazys Maksvytis Tel. +370 5 239 13 06 Fax. +370 5 239 13 31 KazysM@zum.lt Deputy Head of Division: Saulius Urbanas sauliusu@zum.lt Dr. Aldona Sjovall Tel. +370 5 239 84 38 AldonaS@zum.lt
State Enterprise "GIS-Centras"	http://www.gis-centras.lt	Seliu g. 66 LT-08109 Vilnius	Tel. +370 5 272 47 41 Fax. +370 5 272 77 23 info@gis-centras.lt
State Enterprise Centre of Registers	http://www.registrucentras.lt	V. Kudirkos 18 LT-03105 Vilnius	Tel. +370 5 268 82 02 Fax. +370 5 268 83 11 info@registrucentras.lt
Ministry of Environment	http://www.am.lt	A. Jaksto 4/9 LT-01105 Vilnius	Aidas Gudaitis Tel. +370 5 266 36 47 Fax. +370 5 266 36 63 a.gudaitis@am.lt
Institute of Geodesy at the Vilnius Gediminas Technical University	http://www.vgtu.lt	Sauletikio al. 11 LT-10223 Vilnius	Tel. +370 5 274 47 31 Eimuntas.Parseliunas@ap.vtu.lt

3.2 List of references for Lithuania

Table: list of references used to compile the Country Report	
Web sites:	<p>[1]: http://www.am.lt/VI/en/VI/rubric.php3?rubric_id=126</p> <p>[2]: http://www.mapbsr.nls.fi/</p> <p>[3]: http://www.gis-centras.lt/gisweb/index.php?pageid=183</p> <p>[4]: http://www.gis-centras.lt/gisweb/index.php?pageid=232</p> <p>[5]: http://www.gis-centras.lt/gisweb/index.php?pageid=296</p> <p>[6]: http://www.nzt.lt/</p> <p>[7]: http://www.nzt.lt//index.cfm?fuseaction=Home&langparam=EN</p> <p>[8]: http://www.eulis.org/index.html</p> <p>[9]: http://www.hnit-baltic.lt/DesktopDefault.aspx?tabID=3409&alias=hnit-baltic&lang=en-US</p> <p>[10]: http://www.hnit-baltic.lt/DesktopDefault.aspx?tabID=3489&alias=hnit-baltic&lang=en-US</p> <p>[11]: http://unstats.un.org/unsd/geoinfo/N0244282.pdf</p> <p>[12]: http://www.registrucentras.lt/index_en.php</p> <p>[13]: http://www.lgt.lt/index.php?newlang=eng</p> <p>[14]: http://www.ada.lt/index.php?lng=en</p> <p>[15]: http://crs.bkg.bund.de/crs-eu/</p> <p>[16]: http://crs.bkg.bund.de/evrs/</p> <p>[17]: http://europa.eu.int/information_society/policy/psi/implementation/status/index_en.htm</p> <p>[18]: http://www.agi.lt/en/introduction</p> <p>[19]: http://www.agi.lt/lt/produktai/ort10lt</p> <p>[20]: http://www.it.lt/itweb/it3.nsf/toppageen</p> <p>[21]: http://www.ivpk.lt/main_en.php</p> <p>[22]: http://www.kam.lt/index.php/en/</p> <p>[23]: http://www.kada.lt/imone_en.html</p> <p>[24]: http://www.lgt.lt</p> <p>[25]: http://www.lrtv.lt/en_lrtvm.htm</p>

	<p>[26]: http://www.ada.lt/en/docs/lawlegalprot.htm</p> <p>[27]: http://www.is.lt/vgkt</p> <p>[28]: http://crs.ifag.de/description_crs.php</p> <p>[29]: http://europa.eu.int/information_society/policy/psi/implementation/status/index_en.htm</p>
Publications :	<p>M. Craglia and J. F. Dallemand: Geographic Information and the Enlargement of the European Union. EUROGI-European Commission Workshop. Brussels, 16-17/11/2000. Technical Report. EUR 19824 EN http://www.ec-gis.org:8080/wecgis/docs/F22346/IMPAGINATO.PDF [1]</p> <p>GINIE - GI in the Wider Europe Complete Book, October 2003 http://www.lmu.jrc.it/ginie/doc/ginie_book.pdf [16]</p> <p>C. Pubellier, J. Belickas, E. Parseliunas, G. Beconyté and A. Urbsys, Feasibility Study: Development of Lithuanian Geographic Information Infrastructure (LGII), Project Preparation Facility, August 2004, Vilnius, Lithuania. [30]</p> <p>S., Urbanas, 2009. Step Forward Practically Implementing National Spatial Data Infrastructure in Lithuania. Available at: (ftp://ftp.hnit-baltic.lt/public/outgoing/EUC_papers/sdi/SDI_Urbanas_Saulius.pdf)</p>