INSPIRE
Infrastructure for Spatial Information in Europe

Member State Report: LITHUANIA, 2013

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1   Executive summary

This report is submitted in accordance with Commission Decision of 5 June 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting. The report contains information on how the implementation of Directive 2007/2/EC and the related maintenance and development of the infrastructure for spatial information is coordinated in Lithuania; stakeholder cooperation, how and to what extent the infrastructure for spatial information, spatial data sets and electronic services are used; what spatial data sets corresponding to the themes listed in Annexes I, II and III to Directive 2007/2/EC and their metadata are collected by state authorities and what measures have been taken to facilitate more efficient sharing of spatial data sets and related services; what factors complicate the use of the infrastructure for spatial information. The results of the cost/benefit analysis of the implementation of Directive 2007/2/EC are presented.

2   Abbreviations and Acronyms

Directive	Directive 2007/2/EC of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (OJ 2007 L 108, p. 1)
GIS-Centras	State Enterprise National Centre of Remote Sensing and Geoinformatics "GIS-Centras"
GCMF	Geodetic and Cartographic Materials Fund
GCFIS	Geodetic and Cartographic Framework Information System
INSPIRE	Infrastructure for Spatial Information in the European Community
Commission	Commission of the European Communities
LSI portal	Lithuanian Spatial Information Portal
LISI	Lithuanian Infrastructure for Spatial Information
LIGI	Project for the Development of Lithuanian Infrastructure for Geographic Information
MSCP	Member State Contact Point of Lithuania
NLS	National Land Service under the Ministry of Agriculture
LIS	Land Information System
MoA	Ministry of Agriculture of the Republic of Lithuania

3   Introduction

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 (OJ 2007 L 108, p. 1) establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (hereinafter "the Directive") [1] entered into force on 15 May 2007.

To ensure implementation of the provisions of the Directive, the Government of the Republic of Lithuania appointed the National Land Service under the Ministry of Agriculture (hereinafter "the NLS") as responsible for the development of infrastructure measures to ensure the functioning of the metadata, data sets, network services, sharing services for the themes referred to in the Directive and the access to the INSPIRE portal by Point 2 of Resolution 911 of 10 September 2008 "On appointment of the authorities responsible to ensure the implementation of Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007" [9].

By this Resolution, the Government of the Republic of Lithuania charged the Ministry of Agriculture of the Republic of Lithuania (hereinafter "the MoA") with drafting a law amending the Law of the Republic of Lithuania on Geodesy and Cartography and implementing legislation for transposing the provisions of the Directive into the legal system of the Republic of Lithuania. By Point 3 of the Resolution, the MoA was charged to act as a representative at the INSPIRE Committee and technical implementation working groups on issues covered by the Directive, as well as to monitor the implementation and use of the spatial data infrastructure and to submit reports to the European Commission.

Pursuant to Articles 19(2), 21(1), (2) and (3) of the Directive, Article 2(1), (2) and (3) of Commission Decision of 5 June 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting (OJ 2009 L 148, p. 18) [3], Resolution 911 of 10 September 2008 of the Government of the Republic of Lithuania "On appointment of the authorities responsible to ensure the implementation of Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007" (*Official Gazette*, 2008, No 109-4157; 2009, No 116-4940) [9], the MoA, by Order No 3D-344 of 18 April 2011 of the Minister for Agriculture, approved the Procedure for the Provision of Information Required for Monitoring, as well as Preparation and Submission of Reports to the European Commission (hereinafter "the Procedure") [11], which established:

    1. the coordination structure for the monitoring of the implementation and use of the Lithuanian Infrastructure for Spatial Information (hereinafter "the LISI");

    2. the procedure for the submission to the NLS of the information required for the preparation of the list of the spatial data sets and services of the LISI (hereinafter "the list of spatial data sets and services"), the scoreboard for the monitoring of the implementation and use of the LISI (hereinafter "the monitoring scoreboard") and the report to the European Commission on the issues covered in Article 21(2) of Directive 2007/2/EC (hereinafter "the report on the implementation of Directive 2007/2/EC");

    3. the timeframes for the preparation of the list of spatial data sets and services, the monitoring scoreboard and the report on the implementation of Directive 2007/2/EC and their submission to the European Commission in accordance with the established procedure.

In accordance with the Procedure, the NLS collected information required for the preparation of the report on the implementation of Directive 2007/2/EC for 2010–2012 from the authorities managing spatial data sets included in the list of spatial data themes of the Lithuanian Infrastructure for Spatial Information as approved by Resolution No 1460 of 13 October 2010 of the Government of the Republic of Lithuania (*Official Gazette*, 2010, No 123-6297) [10] and, after taking stock of the information received, prepared and submitted this report on the implementation of Directive 2007/2/EC for 2010–2012 to the MoA.

On 27 April 2010, the Seimas of the Republic of Lithuania adopted a new revision of the Law of the Republic of Lithuania on Geodesy and Cartography (No XI-786), which entered into force on 11 May 2010 [6]. This law is the main legislative act transposing the requirements of the Directive into the national law. The law establishes in detail the functions and responsibilities of the authorities as regards the LISI and legitimises the Lithuanian spatial information portal (hereinafter "the LSI portal"), which is intended for managing metadata for spatial data sets, as well as providing spatial data sets and related services through a single internet portal. This law also establishes the Georeferenced Base Cadastre (GRBC). The law establishes that the NLS is the manager, while the State Enterprise National Centre of Remote Sensing and Geoinformatics "GIS-Centras" (hereinafter "GIS-Centras") is the administrator of the LSI portal and the GRBC. The law also establishes that the state cadastre and register management bodies, state and municipal authorities managing the spatial data sets corresponding to the spatial data themes of the Lithuanian Infrastructure for Spatial Information included in the list of spatial data themes of the Lithuanian Infrastructure for Spatial Information [10] must ensure that spatial data sets are accessible to users via the LSI portal.

The main technical decisions implementing the provisions of the Directive have been adopted to carry out the project "Development of Lithuanian Infrastructure for Geographic Information" (hereinafter "the LIGI project") under the measure for the single programming document for 2004–2006 "Development of Information Technology Services and Infrastructure" co-financed from the EU Structural Funds. The main output of the LIGI project was a developed LISI and a state information system providing new access to the LISI—the LSI portal (www.geoportal.lt, hereinafter "the LSI portal").

The LSI portal is intended for managing metadata for spatial data sets, as well as providing spatial data sets and related services online. The NLS is manager, while the State Enterprise "GIS-Centras" is the administrator of the LSI portal. Activities of the LSI portal are regulated by the Law of the Republic of Lithuania on Geodesy and Cartography (*Official Gazette*, 2001, No 62-2226; 2010-05-11, No 54-2649) [6] and the Regulations for the Lithuanian Spatial Information Portal approved by Order No 1P-(1.3.)-91 of 7 March 2012 of the Director of the National Land Service under the Ministry of Agriculture (*Official Gazette*, 2012, No 31-1485) [13]. The LSI portal is a technological platform, which serves as the basis for gradual implementation of the requirements of the INSPIRE

Directive in Lithuania. Implementing measures are planned in accordance with the INSPIRE action plan for 2012–2013.

During the 2010–2012 period, electronic services, including INSPIRE network service prototypes, had been provided and actively used through the LSI portal; the number and diversity of provided spatial data sets increased, the functionality of the LSI portal was improved and developed, and links with other state information systems had been created. With an increase in network services provided through the LSI portal, the number of users of the services of the LSI portal has been growing at a rapid rate.

In 2010–2012, while using the LSI portal, analysing its weaknesses, as well as the feedback and wishes of the users of the services of the LSI portal, it became clear that it was necessary to increase the amount of electronic services and spatial data sets provided through the LISI and create a more favourable environment for providing spatial data through the LSI portal, improve the quality of electronic services provided through the LSI portal, security and accessibility of information, including creation of an access for mobile devices. It is planned to implement the measures to enable management (creation, handling, editing) of spatial data on the internet by the users of electronic services provided through the LSI portal without using specialised GIS software at the workplace, cooperate on their publication and analysis in the LSI portal and develop new electronic services.

In order to ensure timely implementation of the requirements of the Directive, achieve interoperability of electronic services of the LSI portal with the state register and cadastre information systems and provide spatial data corresponding to the data themes listed in Annex I and II of the Directive to the INSPIRE portal, develop the network of data providers and electronic services and increase data usage efficiency by developing new interactive public electronic services for the LSI portal, the NLS, in cooperation with GIS-Centras, prepared an investment project, justified the need for the implementation of the project, the chosen manner of implementation and the need for financing. Following the receipt of assistance from the EU Structural Funds, the project "Development of the Services of the Lithuanian Infrastructure for Spatial Information by Implementing Priority Measures of the Directive" is underway in 2012–2014.

The report has been prepared by using the following methods:
- analysis of implementation of the legislation and the provisions thereof;
- interviews with the representatives of the Lithuanian state and municipal authorities, during which the challenges and opportunities concerning the use of the LISI were identified;
- surveys of the data providers for the LSI portal and users of the services of the LSI portal;
- analysis of the indicators to monitor the use of the LSI portal and the changes thereof;
- a study on the development of the services of the Lithuanian infrastructure for spatial information by implementing priority measures of the Directive.

4 Co-ordination and quality assurance (Art. 12)

4.1 Coordination (Art. 12.1)

4.1.1 Member State contact point

Name and contact information

Coordinating structure supporting the MSCP	
Name of the coordination structure	National Land Service under the Ministry of Agriculture
Contact information:	
Mailing address	Gedimino pr. 19, LT-01103 Vilnius.
Telephone number	+370 (5) 239 1307

Telefax number	+370 (5) 239 1331
Email address	nzt@zum.lt
Organisation's website URL	www.nzt.lt
Contact person (if available)	Jurgita Špūraitė
Telephone number	+370 (5) 200 0327
Email address	jurgita.spuraite@nzt.lt
Contact person - substitute (if available)	Aušra Kalantaitė
Telephone number	+370 (5) 239 8446
Email address	ausrak@zum.lt
Date and period of mandate	From 10 November 2012

Role and responsibilities

The NLS is a state authority of the Republic of Lithuania, which is involved in state policy-making and implementation in the fields of land management and administration, land reform, land management planning, real estate cadastre, accounting, geodesy, cartography, preparation of public georeferenced spatial data sets and development of the LISI [14].

In implementing the state policy of the Republic of Lithuania in the fields of geodesy, cartography, public georeferenced spatial data sets and the LISI, the NLS must perform the following functions [14]:

(1) prepare, in accordance with the procedure established by legislation, programmes for the establishment, updating and mapping of the public geodetic framework, and for ensuring the operation and improvement of public georeferenced spatial data sets and the Lithuanian infrastructure for spatial information, as well as submit them to the Government for approval;
(2) methodically supervise state and municipal geodetic and cartographic works, the works of formation of the public geodetic framework and public georeferenced spatial data sets, ensuring and improvement of the operation of the Lithuanian infrastructure for spatial information, and coordinate, within the limits of its competence, unification and interoperability between spatial data sets and the services of using them;
(3) approve the list of public georeferenced spatial data sets and georeferenced base maps as well as public geodetic network accuracy classes;
(4) organise the implementation of programmes for the establishment, updating and mapping of the public geodetic framework and preparation of public georeferenced spatial data sets and georeferenced base maps;
(5) organise geodetic and cartographic works at the state border of the Republic of Lithuania;
(6) organise the management and improvement of LitPOS;
(7) coordinate the implementation of international and national programmes and projects in the areas of geodesy, cartography and the Lithuanian infrastructure for spatial information;
(8) coordinate aerial photography and remote scanning works with other authorities
(9) prepare and approve technical regulations and specifications for the preparation of geodetic, cartographic and public georeferenced spatial data sets and georeferenced base maps, ensure their compliance with the international standards and requirements of the European Union and the North Atlantic Treaty Organisation (NATO) in the area of collection of geodetic, cartographic and spatial data sets;
(10) issue cartographer's qualification certificates, suspend and cancel qualification certificates in accordance with the procedure established by legislation;
(11) administer, in accordance with the procedure laid down by laws, the exclusive property rights of the authors of georeferenced base maps, public orthophotographic maps and public georeferenced spatial data sets;
(12) establish the procedure for the submission of geodetic, cartographic material and public georeferenced spatial data sets;
(13) perform public supervision and quality control of geodetic and cartographic works, as well as public georeferenced spatial data sets, and ensure and improve the functionality of the Lithuanian infrastructure for spatial information;
(14) store public geodetic and cartographic material (material on the establishment and upgrading of geodetic networks, maps, aerial photographs, space photographs, spatial data sets, etc.);

(15) carry out supervision of geodetic and cartographic works performed in municipalities.

Pursuant to Resolution No 911 of 10 September 2008 of the Government of the Republic of Lithuania [9], the main functions of the NLS as the Lithuanian contact point (hereinafter "the LCP") are as follows:

- maintenance of contacts with the Commission regarding the implementation of INSPIRE;
- creation of infrastructure facilities for ensuring the functionality of metadata corresponding to the themes referred to in the Directive, data sets, network services, sharing services and access via the INSPIRE geoportal.

In accordance with the Procedure for the Provision of Information Required for Monitoring, as well as Preparation and Submission of Reports to the European Commission [11], the NLS, having received and summarised the information from the authorities [10] managing spatial data sets, prepares a list of spatial data sets and services, a monitoring scoreboard and a report on the implementation of Directive 2007/2/EC and submits them to the Ministry of Agriculture.

Based on the Law of the Republic of Lithuania on Geodesy and Cartography, the NLS has been designated as the manager of the LSI portal, which is a technological platform for the implementation of the Directive. The manager of the LSI portal performs the following main functions provided for in the LSI Portal Regulations:

1) organises, coordinates and controls the management, development or modernisation of the Portal;

2) adopts legislation related to the activities of the Portal;

3) plans the need for funding from the state budget for the implementation of the management, development and modernisation of the Portal and for the control on the use of these funds.

4.1.2 The coordination structure

Name and contact information

Member State Contact Point	
Name of the state authority	Ministry of Agriculture of the Republic of Lithuania
Contact information:	
Mailing address	Gedimino pr. 19, LT-01103 Vilnius
Telephone number	+370 (5) 239 1111
Telefax number	+370 (5) 239 1212
Email address	zum@zum.lt
Organisation's website URL	www.zum.lt
Contact person (if available)	Audrius Petkevičius
Telephone number	+370 (5) 239 1338
Email address	Audrius.Petkevicius @zum.lt
Contact person - substitute (if available)	Palmira Petniūnienė
Telephone number	+370 (5) 210 0525
Email address	Palmira.Petniuniene @zum.lt
Date and period of mandate	

Role and responsibilities

The Ministry of Agriculture of the Republic of Lithuania (hereinafter "the MoA") is a state authority of the Republic of Lithuania. The MoA performs state management functions in the areas of agriculture and food sector, fishery and rural development assigned to it by laws and other legislation, and implements national policy in these areas.

The Ministry of Agriculture formulates national policy in the area of preparation of geodetic, cartographic and public georeferenced spatial data sets and the development of the LISI. The objective of the strategic action plan of the MoA "To ensure rational use of the land and efficient

regulation of land relations, as well as development of the infrastructure for geodesy, cartography, real estate cadastre and spatial information" is targeted at the implementation of the Directive.
Under Resolution No 911 of 10 September 2008 of the Government of the Republic of Lithuania [9], the MoA is obliged to:

- draft a law amending the Law of the Republic of Lithuania on Geodesy and Cartography and its implementing legislation for transposing the provisions of the Directive into the legal system of the Republic of Lithuania;
- act as a representative in the INSPIRE Committee and technical implementation working groups on the issues covered by the Directive;
- monitor the establishment and use of the spatial data infrastructure;
- submit reports on the implementation of the Directive in Lithuania to the Commission.

A detailed scheme of the MoA structure is available on the internet at: http://www.zum.lt. The Land Policy Department of the MoA is responsible for the implementation of the Directive.
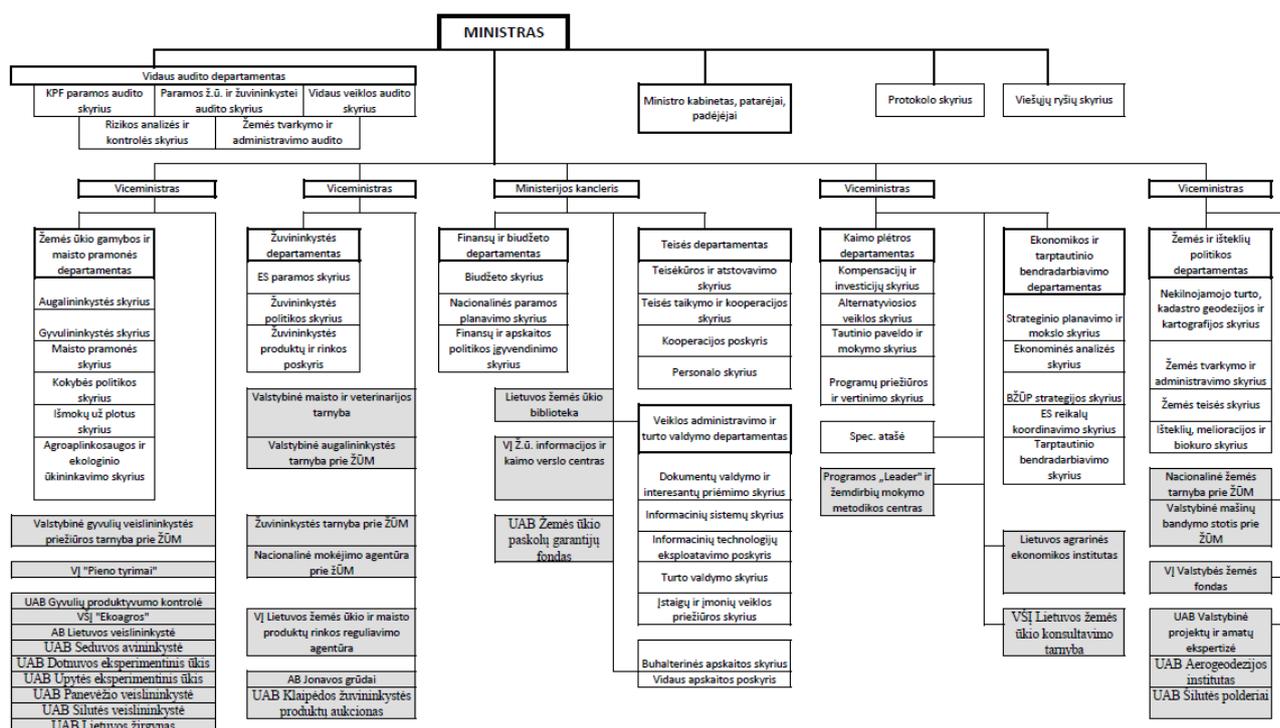
Figure 1. Organisation chart of the MoA

MINISTRAS – MINISTER
Vidaus audito departmentas – Internal Audit Department
KPF paramos audito skyrius – RDF Fund Support Audit Division
Paramos ž.ū. ir žuvininkystei audito skyrius – Agriculture and Fisheries Support Audit Division
Vidaus veiklos audito skyrius – Internal Activities Audit Division
Rizikos analizės ir kontrolės skyrius – Hazard Analysis and Control Division
Žemės tvarkymo ir administravimo audito skyrius – Land Management and Administration Audit Division
Ministro kabinetas, patarėjai, padėjėjai – Cabinet of the Minister, Advisers, Assistants
Protokolo skyrius – Protocol Division
Viešųjų ryšių skyrius – Public Relations Division
Viceministras – Vice-minister
Ministerijos kancleris – Chancellor of the Ministry
Žemės ūkio gamybos ir maisto pramonės departamentas – Department of Agricultural Production and Food Industry
Augalininkystės skyrius – Plant Production Division
Gyvulininkystės skyrius – Animal Husbandry Division
Maisto pramonės skyrius – Food Industry Division
Kokybės politikos skyrius – Quality Policy Division

Išmokų už plotus skyrius – Area Payment Division
Agroaplinkosapsaugos ir ekologinio ūkininkavimo skyrius – Division of Agri-environment and Organic Farming
Valstybinė gyvulių veislininkystės priežiūros tarnyba prie ŽŪM – State Animal Breeding Supervision Service under the MoA
VĮ "Pieno tyrimai" – State Enterprise Pieno Tyrimai
UAB Gyvulių produktyvumo kontrolė – UAB Gyvulių produktyvumo kontrolė (UAB Cattle Productivity Control)
VŠĮ "Ekoagros" – State Enterprise Ekoagros
AB Lietuvos veislininkystė – AB Lietuvos veislininkystė (AB Lithuanian Breeding Station)
UAB Šeduvos avininkystė – UAB Šeduvos avininkystė (UAB Šeduva Sheep Breeding Station)
UAB Dotnuvos eksperimentinis ūkis – UAB Dotnuvos eksperimentinis ūkis (UAB Dotnuva Experimental Farm)
UAB Upytės eksperimentinis ūkis – UAB Upytės eksperimentinis ūkis (UAB Upytė Experimental Farm)
UAB Panevėžio veislininkystė – UAB Panevėžio veislininkystė (UAB Panevėžys Breeding Station)
UAB Šilutės veislininkystė – UAB Šilutės veislininkystė (UAB Šilutė Breeding Station)
UAB Lietuvos žirgynas – UAB Lietuvos žirgynas (UAB Lithuanian Stud Farm)
Žuvininkystės departamentas – Fisheries Department
ES paramos skyrius – EU Support Division
Žuvininkystės politikos skyrius – Fisheries Policy Division
Žuvininkystės produktų ir rinkos poskyris – Fisheries Products and Market Sub-division
Valstybinė maisto ir veterinarijos tarnyba – State Food and Veterinary Service
Valstybinė augalininkystės tarnyba prie ŽŪM – State Plant Service under the MoA
Žuvininkystės tarnyba prie ŽŪM – Fisheries Service under the MoA
Nacionalinė mokėjimo agentūra prie ŽŪM – National Paying Agency under the MoA
VĮ Lietuvos žemės ūkio ir maisto produktų rinkos reguliavimo agentūra – State Enterprise Lithuanian Agricultural and Food Market Regulation Agency
AB Jonavos grūdai – AB Jonavos grūdai
UAB Klaipėdos žuvininkystės produktų aukcionas – UAB Klaipėdos žuvininkystės produktų aukcionas (UAB Klaipėda Fishery Produce Auction)
Finansų ir biudžeto departamentas – Finance and Budget Department
Biudžeto skyrius – Budget Division
Nacionalinės paramos planavimo skyrius – National Support Planning Division
Finansų ir apskaitos politikos įgyvendinimo skyrius – Finance and Accounting Policy Division
Lietuvos žemės ūkio biblioteka – Lithuanian Agricultural Library
VĮ ž.ū. informacijos ir kaimo verslo centras – State Enterprise Agricultural Information and Rural Business Centre
UAB Žemės ūkio paskolų garantijų fondas – UAB Žemės ūkio paskolų garantijų fondas (UAB Agricultural Loan Guarantee Fund)
Teisės departamentas – Law Department
Teisėkūros ir atstovavimo skyrius – Division of Legislation and Legal Representation
Teisės taikymo ir kooperacijos skyrius – Department of Law Enforcement and Cooperation
Kooperacijos poskyris – Sub-division of Cooperation
Personalo skyrius – Personnel Division
Veiklos administravimo ir turto valdymo departamentas – Department of Administrative Matters and Assets Management
Dokumentų valdymo ir interesantų priėmimo skyrius – Division of Document Management and Processing of Citizen Applications
Informacinių sistemų skyrius – Information System Division
Informacinių technologijų eksploatavimo poskyris – Sub-division of Information Technology Maintenance
Turto valdymo skyrius – Assets Management Division
Įstaigų ir įmonių veiklos priežiūros skyrius – Division of Monitoring of State Institutions and Companies
Buhalterinės apskaitos skyrius – Accounting Division
Vidaus apskaitos skyrius – Internal Accounting Sub-division
Kaimo plėtros departamentas – Rural Development Department
Kompensacijų ir investicijų skyrius – Compensation and Investment Division
Alternatyviosios veiklos skyrius – Alternative Activities Division
Tautinio paveldo ir mokymo skyrius – National Heritage and Training Division
Programų priežiūros ir vertinimo skyrius – Programme Monitoring and Evaluation Division

Spec. atašė – Special Attachés

Programos "Leader" ir žemdirbių mokymo metodikos centras – Centre for LEADER Programme and Agricultural Training Methodology

Ekonomikos ir tarptautinio bendradarbiavimo departamentas – Economics and International Cooperation Department

Strateginio planavimo ir mokslo skyrius – Division of Strategic Planning and Science

Ekonominės analizės skyrius – Economic Analysis Division

BŽŪP strategijos skyrius – Division of Common Agricultural Policy (CAP) Strategy

ES reikalų koordinavimo skyrius – Division of EU Affairs Coordination

Tarptautinio bendradarbiavimo skyrius – International Cooperation Division

Lietuvos agrarinės ekonomikos institutas – Lithuanian Institute of Agrarian Economics

VŠĮ Lietuvos žemės ūkio konsultavimo tarnyba – State Enterprise Lithuanian Agricultural Advisory Service

Žemės ir išteklių politikos departamentas – Department of Land and Resources Policy

Nekilnojamojo turto kadastro, geodezijos ir kartografijos skyrius – Division of Real Estate Cadastre, Geodesy and Cartography

Žemės tvarkymo ir administravimo skyrius – Land Management and Administration Division

Žemės teisės skyrius – Land Law Division

Išteklių, melioracijos ir biokuro skyrius – Division of Resources, Land Reclamation and Bio-fuel

Nacionalinė žemės tarnyba prie ŽŪM – National Land Service under the MoA

Valstybinė mašinų bandymo stotis prie ŽŪM – State Machines Testing Station under the MoA

VĮ Valstybės žemės fondas – State Enterprise State Land Fund

UAB Valstybinė projektų ir sąmatų ekspertizė – UAB Valstybinė projektų ir sąmatų ekspertizė (UAB State Inspection of Projects and Estimates)

UAB Aerogeodezijos institutas – UAB Aerogeodezijos institutes (UAB Institute of Aerial Geodesy)

UAB Šilutės polderiai – UAB Šilutės polderiai (UAB Šilutė Polders)

Organisation chart

The organisation chart for the implementation of the Directive is presented in Figure 1. Its key component is the manager of the LSI portal (the NLS) and the administrator of the LSI portal (GIS-Centras).
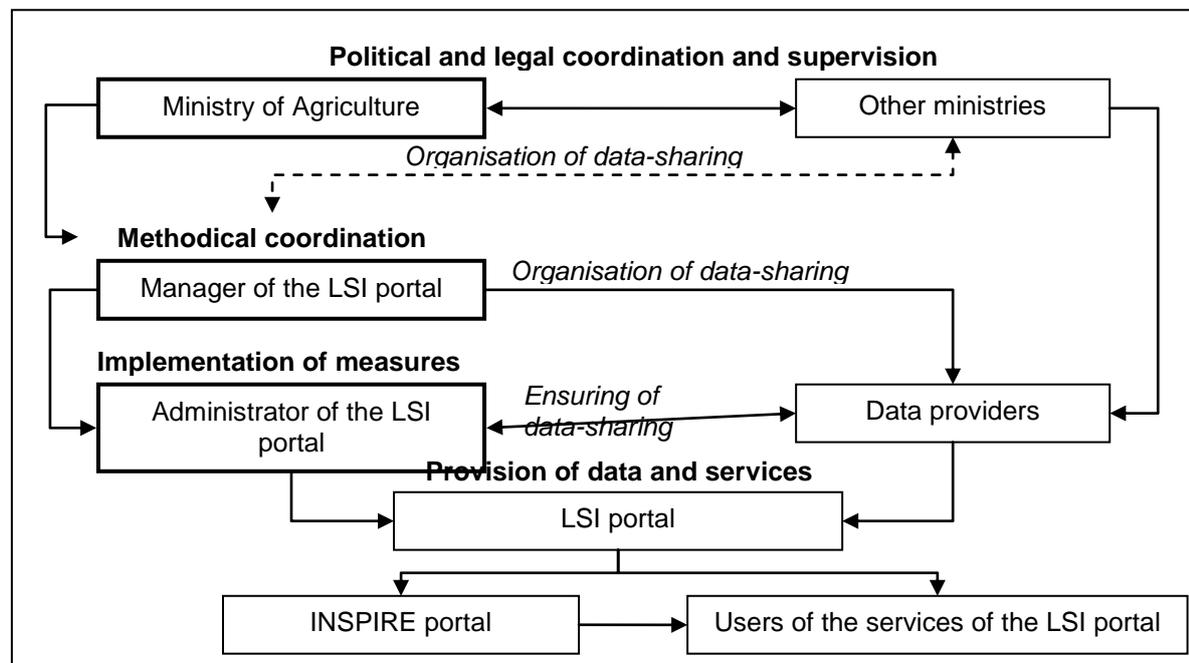

Figure 2. Organisation chart for the implementation of the Directive

The main functions of the **administrator of the LSI portal** established **by the LSI Portal Regulations** [13] are as follows:

1.   ensure continuous operation of the LSI portal and proper functionality of the technical equipment, hardware and software of the LSI portal;
2.   use the hardware and software of the LSI portal;
3.   implement the development and modernisation of the LSI portal;
4.   analyse and remove the operational issues of the LSI portal;
5.   collect metadata from the providers of spatial data sets, accumulate and manage them;
6.   manage, provide and develop electronic services of the LSI portal;
7.   conclude agreements on the provision of data and use of data;
8.   administer the LSI portal website www.geoportal.lt;
9.   manage and store the data of the LSI portal;
10.   ensure implementation of the monitoring of the provision of the electronic services of the LSI portal, as well as metadata and spatial data sets provided through these services;
11.   provide the manager of the LSI portal with the information concerning the data of the LSI portal;
12.   prepare proposals relating to the activities of the LSIP and submit them to the manager of the LSI portal;
13.   consult and train the providers of spatial data sets and users of the data as regards the activities of the LSI portal;
14.   perform the functions assigned to him by the Data Security Regulations for the LSI portal;
15.   carry out other tasks assigned by the manager of the Portal relating to the activities of the LSI portal;
16.   perform other functions assigned to him by the Law of the Republic of Lithuania on the Management of State Information Resources.

Spatial data, on the basis of which other spatial data sets are integrated in the LSI portal, are provided by the following organisations:
1.   The **Residents' Register Service** under the Ministry of the Interior provides the data from the Residents' Register of the Republic of Lithuania;
2.   The **Information Society Development Committee** under the Ministry of Transport and Communications provides the data from the System for Interoperability of the Information Systems of Public Administration Authorities (hereinafter "the VAIISIS");
3.   **GIS-Centras** provides georeferenced base data.

Other spatial data sets are provided to the LSI portal by the **providers of spatial data sets**—managers of state cadastres and registers, state and municipal authorities and other persons creating and/or managing spatial data sets. In accordance with the procedure and under the conditions laid down by the Law of the Republic of Lithuania on Geodesy and Cartography [6] and the LSI Portal Regulations [13], the administrator of the LSI portal concludes agreements on the provision of data with the providers of spatial data sets.

The Law of the Republic of Lithuania on Geodesy and Cartography [6] establishes that state cadastre and register management bodies, state and municipal authorities managing the spatial data sets corresponding to the spatial data themes included in the list of spatial data themes of the Lithuanian Infrastructure for Spatial Information [10] must ensure that spatial data sets are accessible to users via the LSI portal.

The Procedure for the Provision of Information Required for Monitoring, as well as Preparation and Submission of Reports to the European Commission [11] establishes that the authorities managing spatial data sets included in the list of spatial data themes of the Lithuanian Infrastructure for Spatial Information [10] shall submit to the NLS the information required for the preparation of the list of spatial data sets and services, the monitoring scoreboard and the report on the implementation of Directive 2007/2/EC. Authorities managing spatial data sets ensure the quality and reliability of the information provided.

Users of the services of the LSI portal are physical and legal persons who use the data of the LSI portal, spatial data sets and their metadata through the electronic services of the LSI portal.

Relation with third parties

The objective of the LSI portal is to facilitate, through the electronic services of the LSI portal, centralised provision of spatial data sets and their metadata created and/or managed by managers of state cadastres and registers, state and municipal authorities and other persons to the users of the services of the LSI portal. The LSI portal allows the integration of public sector spatial information, information from the main state registers, statistical information and other geographically related information with a national scope in such a way that the various spatial data sets managed by different authorities can be accessed via the single common infrastructure and used and analysed in their entirety.

The administrator of the LSI portal has signed agreements on the provision of data with the third parties (providers of spatial data sets) who are responsible for spatial data sets corresponding to INSPIRE themes and provide spatial data via the LSI portal. The authorities and enterprises collecting and supervising the main national spatial data sets are as follows:

- National Land Service under the Ministry of Agriculture (www.nzt.lt);
- Environmental Protection Agency (http://aaa.am.lt/);
- State Forest Service under the Ministry of the Environment (http://www.lvmi.lt/vmt/);
- Lithuanian Geological Survey under the Ministry of the Environment (http://www.lgt.lt/);
- State Service for Protected Areas under the Ministry of the Environment (http://vstt.lt);
- State Enterprise Centre of Registers (http://www.registrucentras.lt/);
- Lithuanian Road Administration under the Ministry of Transport and Communications (http://www.lra.lt/);
- Fire and Rescue Department under the Ministry of the Interior (http://www.vpgt.lt/);
- Department of Statistics under the Government of the Republic of Lithuania (http://www.stat.gov.lt);
- Lithuanian Hydrometeorological Service under the Ministry of the Environment (www.meteo.lt);
- Lithuanian municipal administrations:
  - Vilnius City;
  - Tauragė District;
  - Šakiai District;
  - Kėdainiai District;
  - Pakruojis District.

The conditions for the provision of data are still being negotiated with the following third parties that do not yet provide spatial data sets:

- Department of Cultural Heritage under the Ministry of Culture (http://www.kpd.lt);
- Lithuanian Maritime Safety Administration (http://www.msa.lt);
- State Territorial Planning and Construction Inspectorate under the Ministry of the Environment (http://www.vtpsi.lt/);
- Vilnius University (www.vu.lt);
- the remaining Lithuanian municipal administrations.

Active cooperation is ongoing with the organisations that use the electronic services of the LSI portal. The above-listed providers of spatial data sets use reference base data and other electronic viewing services in their information systems. There are some organisations that do not provide data but use the services and solutions of the LSI portal: the State Department of Tourism, State Railway Inspectorate, Communications Regulatory Authority, State Enterprise Natural Heritage Fund, Lithuanian Cartographic Society and other organisations.

Overview of working practices and procedures

On 27 April 2010, the Parliament of the Republic of Lithuania adopted the Law amending the Law of the Republic of Lithuania on Geodesy and Cartography establishing the procedure for access to

spatial data via the Lithuanian spatial information portal. The activities of the LSI portal are regulated by the following legislation implementing the Law:
1.   LSI Portal Regulations [13];
2.   LSI Portal Security Regulations [13];
3.   list of the spatial data themes of the LISI [10] (list of the data sets corresponding to INSPIRE data themes approved by the resolution of the Government of the Republic of Lithuania; updated where necessary);
4.   Procedure for the Provision of Information Required for Monitoring, as well as Preparation and Submission of Reports [11];
5.   Procedure for Provision of the Metadata of the Lithuanian Infrastructure for Spatial Information [12];
6.   Rules on Administration of the Users of the LSI Portal;
7.   Rules on Secure Management of the Electronic Information of the LSI Portal;
8.   Plan on the Management of Continuity of the Activities of the LSI portal.

The Specifications of the LSI portal are the main document describing the procedures of the LSI portal. The administrator of the LSI portal, GIS-Centras, is responsible for the definition of and compliance with the internal procedures of the LSI portal.

4.1.3 Comments on the monitoring and reporting process

Currently, the use of the spatial data sets and network services of the LSI portal is being monitored. Measures and procedures for monitoring the accessibility of network services and data have been specified and are being implemented. The LSI portal development project to be carried out in 2012–2014 provides for the installation of fully automated tools for detailed monitoring of the use of spatial data sets and network services.

Acting in accordance with the Commission Decision of 5 June 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting and the Procedure for the Provision of Information Required for Monitoring, as well as Preparation and Submission of Reports to the European Commission [11], the NLS approaches providers of spatial data sets included in the list of spatial data themes of the LISI [10] annually with a request to provide information on spatial data sets and metadata collected by them, as well as related services. After analysing the material received, the NLS and GIS-Centras prepared structured information on the current situation in Lithuania, which forms the basis for this report. The comment submission process is going smoothly; the main difficulties arise due to different interpretation of some of the report indicators by different organisations; therefore, additional explanations are sometimes necessary.

Performance of monitoring also includes conducting satisfaction surveys with users of the services of the LSI portal. It is envisaged that in the coming years such surveys will be conducted twice a year.

Monitoring results are published on the LSI portal in INSPIRE thematic fields in Lithuanian and in English.

4.2 Quality Assurance (Art. 12.2)

4.2.1 Quality assurance procedures

The LSIP manager and data providers are responsible for the quality of data and network services in accordance with the procedure laid down by laws and other legislation.

Pursuant to the Law of the Republic of Lithuania on Geodesy and Cartography:
1.   State cadastre and register management bodies and state and municipal authorities managing spatial data sets corresponding to the spatial data themes of the Lithuanian infrastructure for spatial information approved by the Government must ensure that spatial data sets are accessible to users via the Lithuanian spatial information portal.

2.   Spatial data sets must be created in accordance with the procedure established by the authority authorised by the Government and the requirements approved by the European Commission.
3.   The contents, symbols, element codes and attributes of spatial data sets must be determined by the authority authorised by the Government.
4.   For the purpose of defence, spatial data sets must be compiled according to the NATO standard codification system and data structure.
5.   Spatial data sets must be compiled so that it is possible to collect, manage, store and integrate them with other spatial data sets in a systematic manner and in line with the general interoperability requirements, as well as to apply them in state cadastres, registers and information systems.
6.   Bodies managing state cadastres, registers and spatial data sets collected by state and municipal authorities must prepare metadata according to the requirements for metadata of the Lithuanian infrastructure for spatial information approved by the authority authorised by the Government and provide them publicly and free of charge via the Lithuanian spatial information portal in accordance with the procedure established by the authority authorised by the Government.
7.   Having agreed it with the authority authorised by the Government, the authority responsible for the creation of metadata may expand the contents of metadata with additional information. Metadata must be detailed and accurate so that they can help find, evaluate the quality of and use spatial data sets and related services.

The LSI Portal Regulations, LSI Portal Security Regulations, Procedure for Provision of Metadata of the Lithuanian Infrastructure for Spatial Information [12] and other legislation currently under preparation provide for additional quality assurance requirements.

Detailed requirements for the quality of data provision and metadata relevance will be laid down in the agreements on the provision of data via the LSI portal.

The following quality assurance procedures are currently implemented in the LSI portal:
- quality (accessibility and efficiency) assurance of the provision of electronic services via the LSI portal;
- metadata validation is performed semi-automatically during the provision of metadata;
- validation of the configuration of spatial data services (SDS) is performed by the administrator of the portal after testing. SDS configuration parameters are agreed with data providers and both parties pledge not to change them without prior agreement.

4.2.2 Analysis of quality assurance problems

Authorities managing spatial data sets ensure the quality of the spatial data sets and network services provided within the limits of their competence. Sometimes there are minor disruptions in the provision of network services by data providers via the LSI portal but those are relatively few (from a few to over a dozen instances a year) and they are addressed by informing and consulting the providers of spatial data sets.

The main objective quality assurance problem is the absence of targeted financing and lack of internal resources in most of the existing and potential data provider organisations, which makes it difficult for data providers to achieve the desired quality of data or electronic services provided.

Most problems are encountered by the municipal administrations, especially the smaller ones that do not always collect spatial metadata properly and also lack human resources and competences. Some authorities lack the understanding of the importance of proper management of spatial information and have no tradition of using spatial data in decision-making, so they cannot take full advantage of the opportunities provided by the INSPIRE and LSI portal.

Having evaluated the variety, scope and quality of the data accessible through the portal, the size of the Lithuanian spatial information sector and possibilities for the users, and taking into account the trends in the use of spatial information portals in other European countries, it may be stated that the users of spatial information in Lithuania are active, understand the benefits provided by spatial data

and quickly learn to use them, while their needs are growing rapidly. The continuous survey of the users of the LSI portal conducted in 2010–2011 showed that free but high-quality spatial data and public services that would make it possible to solve simple spatial problems without using special GIS equipment on the user side are in particularly high demand (this was indicated by 75% of the respondents as the most important feature). The administrator and the manager of the LSI portal are developing the LSI portal in view of this need.

4.2.3 Measures taken to improve quality assurance for the infrastructure

The administrator of the LSI portal ensures the security of the LSI portal by organisational and technological means. The specifications of the LSI portal have been approved; and work is under way to draft the Rules on Administration of the Users of the LSI Portal, the Rules on Secure Management of the Electronic Information of the LSI Portal and the Plan on the Management of Continuity of the Activities of the LSI portal, which define the quality assurance procedures and requirements. The interactive help system is regularly updated and expanded; user instructions (text and visual aids) are being developed.

A regular back-up of the LSI portal system data is performed which is in compliance with the required level of system accessibility and restorability; protection of the LSI portal data from unlawful destruction, alteration or any unlawful forms of processing is ensured; management of measures used for the safe provision of e-services via the LSI portal is carried out (Web security services, WSS). The operating logs of the LSI portal on accessibility, attendance, security and back-up are updated on a regular basis.

In 2010–2012, the administrator of the LSI portal ensured access to electronic services via the LSI portal for at least 99 per cent of the time. The functions of the LSI portal were restored after malfunctions, on average, within less than 3 minutes of the malfunction. Most of the longer-than-average cases of inaccessibility happened during night time. The tools for the monitoring of the use of LSI portal services and registration of problems are in continuous operation; therefore, any problems that occur are promptly addressed.

The administrator of the LSI portal provides information and advice to spatial data providers on a regular basis, prepares methodological material for their use, encourages the provision of more spatial data services and assists with their development, where possible. It may be stated that the competence of spatial data providers has greatly increased over the last three years, and more and more spatial information is being used to justify decisions. This is evident from the growing use of the LSI portal services.

In 2012–2014, the NLS and GIS-Centras have been carrying out the LSI portal development project "Development of the Services of the Lithuanian Infrastructure for Spatial Information by Implementing Priority Measures under the Directive (LISI-INSPIRE)", which is financed from the EU Structural Funds. The complex solutions envisaged in the project covering both the modernisation of existing LSI portal systems and the creation of the new components required in order to ensure successful implementation of the provisions of the Directive, increase the number of electronic services provided by the LSI portal and the efficiency of the use of spatial information. The objectives of the project are as follows:
1.   create and install the tools for the interoperability of electronic services in the LSI portal in line with the requirements of the Directive's implementing rules (hereinafter "the interoperability tools");
2.   modernise the LSI portal and Georeferenced Base Cadastre systems so that they are in line with the requirements of the Directive's implementing rules and so that a quality service for the users is ensured;
3.   create four interactive public electronic services that would provide the users of the LSI portal with new possibilities of using spatial information.
Following the completion of the project, the quality of the infrastructure will undoubtedly increase; installation of the tools for the management of spatial data on the internet will lead to a partial solution of the problems that are currently encountered by potential spatial data providers, and there will be a further increase in use of the LSI portal.

4.2.4 Quality certification mechanism

The administrator of the LSI portal, the NLS, is preparing to implement a quality management module that is in line with the requirements of the ISO 9001:2008 standard. A working group has been set up by Order No 1P-(1.3.)-494 of 6 December 2012 of the Director of the National Land Service under the Ministry of Agriculture, which coordinates the process of implementation and certification of the quality management module that is in line with the requirements of the LST EN ISO 9001:2008 standard "Quality Management Systems" at the NLS. During the implementation of the quality management module, the working group analyses and defines the operational processes carried out by the NLS and their interoperability, and seeks to establish the criteria and methods to ensure efficient operation and management of the processes of the quality management module.

The administrator of the LSI portal State Enterprise GIS-Centras is planning to introduce a quality management module that is in line with the requirements of the ISO 9001:2008 standard in 2013.

Some of the providers of spatial data sets for the LSI portal have implemented quality management modules:
- the Lithuanian Department of Statistics prepares relational data whose quality is ensured by the implemented quality management system that is in line with the requirements of the ISO 9001 standard. The field of certification covers organisation of statistical surveys, preparation and dissemination of statistical information;
- the Lithuanian Maritime Safety Administration ensures the quality of the depth data provided on the basis of the standards adopted by the International Hydrographic Organisation. The quality management system EN ISO 9001-2008 is implemented in this body;
- the State Forest Service verifies the data provided by its data providers before the registration of these data in the State Forest Cadastre of the Republic of Lithuania; based on the nature of the object inspected, desk reviews are conducted, as well as on-the-spot verifications of forest data. There is an established practice and procedures for the correction of erroneous data;
- the Lithuanian Hydrometeorological Service under the Ministry of the Environment has implemented the quality management system ISO 9001:2008;
- the Lithuanian Geological Survey under the Ministry of the Environment ensures the quality of spatial data by using data management tools and cross-checking these data with the spatial data managed by other authorities;
- the Lithuanian Road Administration ensures the quality of spatial data by performing regular measurements and data revision works;
- the Fire and Rescue Department under the Ministry of the Interior ensures the quality of spatial data by regular updates.

Providers of spatial data for the LSI portal are not certified at present. The right to provide spatial data sets is considered to be enjoyed by each state or municipal authority which:
- manages state or municipal digital spatial data sets, performing the functions assigned to it by legislation;
- agrees and is capable of fulfilling the conditions for the provision of spatial data set out by the administrator of the LSI portal for the provision of spatial data set services and metadata;
- signs an agreement on the provision of spatial data with the LSIP administrator, which sets out the obligations of the data provider concerning the contents of the spatial data set and the quality of provision of these data.

5 Functioning and coordination of the infrastructure (Art.13)

5.1 General overview description of the SDI

The Lithuanian infrastructure for spatial information was legitimised by the Law on Geodesy and Cartography in 2010. Pursuant to Article 18 of the Law, the LISI is designed for:

1. collecting metadata for spatial data sets of state cadastres, registers, state and municipal authorities according to a methodology approved by the authority authorised by the Government;
2. providing spatial data sets and related metadata via the Lithuanian spatial information portal;
3. ensuring the quality of services provided via the LSI portal and required technological solutions;
4. coordinating and monitoring the services of using spatial data sets and related metadata;
5. ensuring interoperability of spatial data sets.

Development of the LISI is aimed at:
1. making it possible to combine spatial data sets of different state and municipal authorities and state authorities of different countries in a consistent way;
2. making it possible to use spatial data sets with various software tools;
3. making it possible to link public georeferenced spatial data sets with spatial data sets created by municipal authorities;
4. making it possible to familiarise oneself with spatial data sets and conditions for using spatial data sets.

The LISI technical requirements are set out by the NLS and implemented by the administrator of the LSI portal.

The organisational structure of the LISI is based on the information system of the LSI portal and the cooperation between the providers of spatial data sets and the users of the electronic services of the LSI portal.

The LSI portal website can be accessed at the address www.geoportal.lt. The functional architecture of the information system of the LSI portal is made up of the subsystems, software and hardware defined in the LSI Portal Regulations, part of which will have to be modernised. The existing functional architecture of the information system of the LSI portal is made up of the following subsystems:

1. content management;
2. creation and management of metadata;
3. search for metadata;
4. management of electronic services;
5. ordering of an electronic service;
6. processing of orders;
7. protection of electronic services;
8. monitoring;
9. the manual of geographical information concepts;
10. provision of information;
11. map browser;
12. administration of data users;
13. administration of orders;
14. management of documentation;
15. financial management;
16. management of the relations with data users;
17. preparation of reports.

5.2 INSPIRE Stakeholders

All users of spatial information whose goal is to receive as many public spatial information services as possible may be considered INSPIRE stakeholders:

1. coordinating organisations: the Ministry of Agriculture of the Republic of Lithuania, the manager and the administrator of the Lithuanian spatial information portal, managers of state registers, cadastres and information systems, the Information Society Development

Committee. The following authorities, which do not directly participate in the development of the LISI but provide the information and methodological aid required for the links, may also be classified as coordinating organisations: the Residents' Register Service, the State Personal Data Protection Inspectorate, the State Commission of the Lithuanian Language;

2.   managers and providers of official spatial data sets: managers of state registers, cadastres and information systems, municipal administrations. The main providers of spatial data sets for the LSI portal: the NLS, State Enterprise Centre of Registers, Lithuanian Road Administration under the Ministry of Transport and Communications, State Service for Protected Areas under the Ministry of the Environment, State Forest Service, Environmental Protection Agency under the Ministry of the Environment, State Enterprise GIS-Centras, Lithuanian Department of Statistics, Fire and Rescue Department under the Ministry of the Interior, Vilnius City Municipality administration, Lithuanian Geological Survey under the Ministry of the Environment;

3.   other owners of spatial data sets and current or potential data providers, including universities, institutes and businesses;

4.   providers of spatial information, system creation and development services: state and private enterprises. This includes the administrators of information systems using the functionality of the LSI portal in their systems, such as the State Land Fund;

5.   public organisations: Lithuanian Association of Surveyors, Lithuanian Cartographic Society, Lithuanian Geographical Society;

6.   users of the services of the LSI portal: users who belong or do not belong to the groups listed above.

5.3 Role of the various stakeholders

The involvement and cooperation of all other parties in problem solving is important for the **coordinating organisations**. By implementing the provisions of the Directive, these parties aim to ensure that:

•   spatial data are stored, made available and maintained at the most appropriate level;

•   it is possible to combine spatial data from different sources and state authorities of different countries in a consistent way and share them between several users and applications;

•   it is possible for spatial data collected at one level of public authority to be shared between other public authorities;

•   spatial data are made available under conditions which do not unduly restrict their extensive use;

•   it is easy to discover available spatial data, to evaluate their suitability for the purpose and to know the conditions applicable to their use.

To this end, consultations are conducted, cooperation is developed, and information and publicity measures are implemented.

The key role of the **managers and providers of official spatial data sets** is to provide the LISI with good quality spatial data and services, provide timely data updates and correct the errors noticed by users and registered in the LSI portal. These parties are also involved in the negotiation and adoption of decisions on spatial information policy, the requirements raised thereto and the provisions on the exchange of information.

For Lithuanian public administration bodies, the possibility provided by the LISI to perform efficiently the functions assigned to them is most important. Legislation obligates the authorities to provide data, reports, other information and different services to other authorities, residents and businesses. Therefore, it may be said that the needs of public administration bodies are based essentially on statutory obligations. They use the LISI portal to download data for the authority's purposes (the georeferenced base is most actively used, there is a demand for data from the main state registers) and to provide data.

Lithuanian public administration bodies still lack competence in the matters of the use of infrastructure, its point and purpose is often difficult for them to understand. Therefore, in order to make the use of the LISI more efficient, additional systematic explanatory work is needed covering both the

understanding of the LISI and training in the use of specific existing or future spatial data management tools.

The LISI data services are particularly important for municipal and state authorities that have limited resources for the work with spatial data and only tackle specific public administration tasks (e.g., check out the specific location before issuing a permission to cut down a tree or measure the distance to a body of water). Spatial data provided via the LSI portal could be used for solving various analytical problems, automation of management processes and development of solution support systems in the public and business sectors.

Currently, the priority task for the development of the LISI includes stronger integration of municipalities.

Other owners and existing or potential providers of spatial data sets are also usually active users of the services of the LSI portal who create, manage or update their spatial data sets by using the services of the LSI portal.

Providers of spatial information services are most interested in using the already created LISI solutions to create other solutions or develop systems. They also make a significant contribution as service providers in the projects for the expansion and development of the LSI portal implemented by the manager and the administrator of the LSI portal.

The vision of creation and development of the LISI included one of the priorities set for the next three years after the LIGI project—creation of a favourable environment for the business sector (integration of spatial data and services in business processes with a view to their optimisation). Therefore, apart from the general development of the LISI to satisfy the needs of all sectors, this also includes implementation of the tasks to satisfy specific needs of the business sector by including the data necessary for the business sector, developing new spatial data services, enabling the business sector to develop and provide services to users. Users of spatial information from the business sector can be characterised by high efficiency of their activities, are not willing to make unreasonable investments in the infrastructure, take blind risks and pay for questionable (intangible) results. Therefore, the new services developed for these users should have a user-friendly interface and a flexible payment system. Better adaptation of the LISI for the needs of the business sector would allow taking full advantage of the business sector potential in developing value-added services for businesses, the general public and the public sector.

Business needs influence the need for spatial data. The following main necessary data groups may be identified that correspond well to the INSPIRE themes and will certainly facilitate the creation and provision of spatial data sets in the future (they are not currently provided or are provided with restrictions):

- the georeferenced base managed by the State Enterprise GIS-Centras. Relevant data: the base for the preparation of derivative data and maps, some of its data are intended for analysis: road, river networks, etc.;
- demographic data managed by the Department of Statistics under the Government of the Republic of Lithuania. These include the population count, composition by age, gender, social and marital status, household information, the size and composition of the family, education, birth rate, mortality rate, etc.;
- real estate data managed by the State Enterprise Centre of Registers. These include the location, characteristics, owners, value of real estate, etc. (currently, information is provided with restrictions);
- road network data relevant for the analysis of accessibility, logistical problems;
- river network data relevant for water-based tourism businesses;
- population health data managed by the Institute of Hygiene and other authorities. These include information on morbidity from cardiovascular diseases, causes of death, etc. These data would be most relevant to pharmaceutical companies that are interested in efficient marketing of medicinal products, optimisation of the sales network.

LSI portal systems in line with the requirements for INSPIRE network services ensure the stability and speed of information transfer, which is very important for business. Furthermore, business needs often

cross the borders of a single state, therefore, services provided by the INSPIRE portal may also be important.

Civil organisations contribute to making the LISI services public, establishing interest groups, assessing the quality of the LISI services and the spatial data sets provided.

Businesses (geodetic, tourism, real estate companies; administrators of information catalogues online, etc.) are currently actively interested in the opportunity to provide their geographic information with respect to the spatial data available via the LISI.

Public needs are closely related to the needs of public administration authorities as the controllers of data important to the public. However, from the point of view of the public itself, in order to make the LISI popular and to improve it use, these essential needs of every citizen must be taken into account enabling them to:

- find as much information on the citizens' property (real estate) as possible;
- find information on each citizen's means of expression, welfare improvement and business opportunities (possible conditions for economic activities);
- find information on the environmental status and risks, population health, social statistics and other indicators, recreational resources;
- engage in lifelong learning, learn more about the country;
- participate in projects, e.g. environmental projects, which are supplied with information by the residents;
- have tools for the collection and administration of spatial information (e.g., flagging the places visited, marking the route, etc.).

5.4 Measures taken to facilitate sharing of spatial data sets and related services between public authorities

To ensure convenient data sharing between state registers, cadastres and information systems, the Law on the Management of State Information Resources had been adopted in 2011, establishing formation and implementation of the state policy on information resources, key principles for the creation and management of state information resources, as well as the rights, obligations and responsibilities of the managers and administrators of registers and state information systems, and other physical and legal entities providing data and information to and receiving it from registers and state information systems.

There is a State Information Resources Interoperability Platform operating in Lithuania, which is a state information system intended to make it possible for persons to use public and administrative electronic services provided by authorities and provide services to authorities, including services that facilitate data sharing between authorities, through the single point of contact.

Bodies managing state cadastres, registers and spatial data sets collected by state and municipal authorities must prepare metadata in accordance with the Description of the Requirements Applicable to Metadata of the Lithuanian Infrastructure for Spatial Information and of the Procedure for the Provision of Metadata of the Lithuanian Infrastructure for Spatial Information [12], and provide these metadata publicly and free of charge via the Lithuanian spatial information portal.

Data sets contained in the LISI as specified in the Law on Geodesy and Cartography are spatial data sets collected by all state cadastres, registers and state and municipal authorities. State cadastre and register management bodies, state and municipal authorities managing the spatial data sets corresponding to the spatial data themes of the Lithuanian Infrastructure for Spatial Information approved by the Government must ensure that spatial data sets are accessible to users via the LSI portal.

Spatial data sets for state and municipal authorities and enterprises in Lithuania are created in such a way that they can be collected, managed, stored, integrated in other spatial data sets, as well as used in state cadastres, registers and information systems systematically and in line with the general interoperability requirements. The procedure for the creation of spatial data sets, contents, symbols,

element codes and attributes of spatial data sets are established by the authority authorised by the Government. If a spatial data set undergoing restructuring is included in the regularly updated list of data sets corresponding to INSPIRE themes as approved by the Government, it will be subject to the requirements approved by the European Commission.

5.5 Stakeholder cooperation

Stakeholder cooperation is legitimised by legislation, takes place on the basis of bilateral and trilateral agreements or is informal.

There are the following types of formal cooperation:
1. policy-making in the field of spatial information and coordination of spatial data sharing at the national level;
2. provision of the entity's spatial data sets and/or electronic services via the LSI portal;
3. use of the electronic services provided via the LSI portal in the entity's information system and/or internet portal;
4. integration of the entity's information system or a part thereof in the LSI portal by using the functionality of the LSI portal.

All stakeholders engage in active cooperation in the fields of information and publicity. Since Lithuania is a small country and the stakeholders are well-informed, in order to ensure flexibility, we do not see the need for regulation of such cooperation by written agreements.

The main providers of spatial data sets of the LSI portal use georeferenced data viewing services and other electronic services for viewing spatial data in their information systems.

An example of the use of electronic services provided via the LSI portal in the entity's information system is the Official Statistics Services Portal (http://osp.stat.gov.lt/) providing map-based public electronic services, the basis for which (common maps) is obtained by using the electronic services of the LSI portal.

Some organisations that do not provide data but use the services and solutions of the LSI portal include the State Department of Tourism, State Railway Inspectorate, Communications Regulatory Authority, State Enterprise Natural Heritage Fund and other organisations and enterprises.

Linking and partial integration of stakeholder information systems in the LSI portal is a very promising form of cooperation that allows reducing the costs of development and maintenance of information systems and taking better advantage of the opportunities provided by the LISI. Examples of successful integration of five systems can be provided for the reference period.
The LSI portal (www.geoportal.lt) provides a platform that can be used for the implementation of various solutions related to the provision of spatial data by using the already created and functioning components of the LSI portal. One example of implementation of such solutions is integration of state information systems related to spatial information. While the LSI portal provides spatial data or e-services of external information systems, it also develops complex services covering the functionality of the previous information systems (management, data viewing, submission of information), as well as spatial data. Currently, information system solutions are integrated in the LSI portal at different levels:
1. The GIS functionality, which is necessary for rendering spatial data in the information system, is integrated in the map browser of the LSI portal as a module(s). Examples of application:
    1.1.   the services of the Land Information System (hereinafter "the LIS") are integrated in the map browser of the LSI portal as a module. The module with specialised functions dedicated for viewing and analysis of spatial data and other additional functionality is created and developed separately by the administrator of the information system. Entering an additional query parameter *(?mode=zis)* in the map browser of the LSI portal loads the map browser of the LSI portal, which in turn loads the LIS module. LIS services are available at the address https://www.geoportal.lt/map/index.jsp?mode=zis.

    1.2.   the Geodetic and Cartographic Materials Fund is a module, which uses data from the archive of geodetic and cartographic materials and provides the users of the map browser of the LSI portal with additional functionality to search, view and download the fund's maps.

    1.3.   the service involving search for and view of land management project plans is a module, which uses data from the archive of land management project plans and enables the users of the map browser of the LSI portal to search, view and download land management plans in different formats.

2. The functionality of the content management system needed to administer the public information content of the information system, create and maintain the website is integrated in the content management system of the LSI portal by creating new thematic areas, internal pages, forums, enquiry templates, etc., and granting access to the managers responsible for the management and editing of these areas. Examples of application:

    2.1.   The Geodetic and Cartographic Framework Information System (hereinafter "the GCFIS") currently is a thematic area of the LSI portal, which is fully integrated in the content management system of the LSI portal and serves as a full-fledged online access to the GCFIS. The content and functionality of the GCFIS website (www.gkpis.lt) has been transferred to the LSI portal from the old version of the internet page and additionally enhanced by such functions as the user forum, enquiries to managers, direct access to GCFIS spatial data accessible via the LSI portal. Management of online access information is carried out by using content management system tools of the LSI portal, which are allowed to be accessed by the relevant managers of this area. The online access to the GCFIS is available at: www.geoportal.lt/GKPIS.

    2.2.   The information system of the Geodetic and Cartographic Materials Fund (hereinafter "the GCMF") is a thematic area of the LSI portal, which is fully integrated in the content management system of the LSI portal and serves as a full-fledged online access to the GCMF.

    2.3.   Civil organisations is a thematic area of the Lithuanian Cartographic Society, which uses the functionality of the content management system of the LSI portal and serves as a full-fledged online access to the Lithuanian Cartographic Society. Useful information is collected in this thematic area, which is accessible to all users of the LSI portal.

3. Spatial data used and provided by the information system are integrated in the common hardware and software for the management of the databases of the LSI portal. Examples of application:

    3.1.   The GCFIS: all information system data are stored and published in the infrastructure of the LSI portal.

    3.2.   The LIS: all information system data are stored and published in the infrastructure of the LSI portal and edited by the administrator of the information system.

    3.3.   The archive of land management project plans: scanned land management project plans are stored in the infrastructure of the LSI portal and are accessible by using e-services of the LSI portal.

Activities involving development of the LISI, the LSI portal and implementation of the Directive have been communicated during information events, in publications and reports.

Articles published during the reference period:

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2. Beconytė G. and Kryžanauskas A. (2010). Geographic communication for sustainable decisions. *Technological and Economic Development of Economy. Baltic Journal on Sustainability. 2010, Vol. 16 (2). Vilnius: Technika, (anglų k.), ISSN 1392-8619 print / ISSN 1822-3613 online*

3. Beconytė G., Kryžanauskas A. ir Papšienė L. (2010) Lietuvos erdvinės informacijos infrastruktūros plėtros perspektyvos. *Mokslas Gamtos mokslų* fakultete. Vilnius, p. 125–134.

4. Straipsnis ESRI Finland žurnale http://www.esri.fi/yritysinfo/asiakaslehti/

5. Straipsnis laikraštyje "Lietuvos žinios" Nr. 273 (12802), 2010 lapkričio 29 d. > Mokslas ir mokslininkai > Žemėlapyje - beveik apie viską. http://www.lzinios.lt/lt/2010-11-29/mokslas_ir_mokslininkai/zemelapyje_beveik_apie_viska.html

6. Eismontaitė A. ir Beconytė G. 2010 m. šalies įvykiai ir nusikalstamumas – viešosios informacijos pateikimas žemėlapiuose. Filosofija. Sociologija. 2011. T. 24. Nr. 4:405–413

7. Beconytė G., Kalantaitė A. and Stankevičius Ž. 2010. Automation of update of digital national geo-reference databases. Technological and Economic Development of Economy. Baltic

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8. Beconytė G. and Katz D. (2011). Cartographic technology in linguistic and humanistic research. Environmental engineering, 3: 1290-1296. ISBN: 978-9955-28-829-9 (3 volume), ISBN: 978-9955-28-827-5 (3 volumes); ISSN 2029-7106 print, ISSN 2029-7092 online.

9. Beconytė G. and Katz D. (2011). Atlas of Northeastern Yiddish: Importance of Maps in Linguistic Research. Geodezija ir kartografija (Geodesy and Cartography), 2011, Nr.37 (3), p.119–124

10. Papšienė, L.; Papšys, K. 2011. Possibilities of updating small-scale basic spatial data in Lithuania using generalization methods. Geodesy and Cartography, 37(4): 143-148.

11. Papšienė, L.; Kalantaitė, A.; Papšys, K. 2011. Conceptual model for generalisation of Lithuanian spatial reference data. In 8th International Conference "Environmental Engineering". Selected papers. Vol. 3: 1402-1407.

12. *Papšienė, L.; Papšys, K. 2012. Changes affecting generalization of land cover features in a smaller scale. Geodesy and Cartography, 38(3): 98-105.*

Reports read at the events during the reference period:

1. Data transformation in the Lithuanian NSDI portal. A. Kryžanauskas. FMEdays 2010, 9-10 March, 2010, Muenster, Vokietija.

2. Project based approach developing National Spatial Data Infrastructure in Lithuania. Saulius Urbanas, Aušra Kalantaitė and Mindaugas Pažemys. INSPIRE Conference 2010: "INSPIRE as a Framework for Cooperation". 2010-06-22–25, Krokuva, Lenkija.

3. Pricing and Ordering in the Lithuanian Geoportal. Lina Papšienė, Jūratė Kučienė and Giedrė Beconytė. INSPIRE Conference 2010: "INSPIRE as a Framework for Cooperation". 2010-06-22–25, Krokuva, Lenkija.

4. Tools for Handling and Publishing Metadata in the Lithuanian Geoportal. Jūratė Kučienė and Audrius Kryžanauskas. INSPIRE Conference 2010: "INSPIRE as a Framework for Cooperation". 2010-06-22–25, Krokuva, Lenkija.

5. Lietuvos erdvinės informacijos infrastruktūros plėtros perspektyvos. Beconytė G., Kryžanauskas A. ir Papšienė L. Konferencija *Mokslas Gamtos mokslų* fakultete. Vilnius, 2010-10-22

6. "Lietuvos erdvinės informacijos infrastruktūros vystymo prielaidos". VGTU. Respublikinė konferencija „Civilinė inžinerija ir geodezija". Beconytė G., Papšienė L. Vilnius, 2010-10-22

7. Balčiūnas A. (2011). Qualimetric research method application in high interactivity level functionality assessment of internet maps. 8th International Conference on Environmental Engineering. 2011 05 19–21, Vilnius, Lithuania.

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9. Balčiūnas A. 2011. Portalo sistemos ir plėtra. Seminaras "Erdvinių duomenų infrastruktūros teritorijų planavimui". 2011 rugsėjo 15-16 d., VšĮ „Šiaulių regiono plėtros agentūra", Šiauliai.

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12. Papšienė L. 2011. Erdvinių duomenų infrastruktūros esmė, sandara ir reikšmė planavimui. LEII. Seminaras "Erdvinių duomenų infrastruktūros teritorijų planavimui". 2011 rugsėjo 15-16 d., VšĮ „Šiaulių regiono plėtros agentūra", Šiauliai.

13. Balčiūnas A., Papšys K. 2011. „Lietuvos geoportalo galimybės ir perspektyvos". Lietuvos Esri vartotojų konferencija. 2011 spalio 6-7d., Vilnius.

14. Balčiūnas A. „GIS ir geoportalas". 2011 lapkričio 16 d., Edukologijos universitetas, Vilnius

15. Balčiūnas A. „Geoportalo taikymo galimybės". 2011 lapkričio 30 d., Gamtos paveldo fondas. Vilnius.

16. Balčiūnas A. (2012-03-23). Pradiniai matavimams reikalingi duomenys - kokiais būdais ir kokius duomenis galima gauti. Lietuvos matininkų konferencija LMA'2012, Trakai, Lietuva. LMA'2012 konferencijos metu pristatytas Portalas, jo taikymo galimybės matitinkams sulaukė

itin didelio susidomėjimo ir tai lėmė išaugusį Portalo lankomumą po konferencijos. Buvo pasiektas vienas didžiausių savaitinių naudotojų srautų per 2011-2012 metus.

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20. Balčiūnas A. „Georeferencinio pagrindo kadastras ir geoportalas“ Lietuvos ESRI naudotojų konferencija. 2012 m. spalio 4 d., Vilnius.
21. Balčiūnas A. „Spatial data infrastructure portal of Lithuania – geoportal.lt“. Pranešimas Ruandos Registrų tarnybos atstovams. Nacionalinė žemės tarnyba, 2012 m. spalio 17 d., Vilnius.
22. Balčiūnas A. „Geografinių el. paslaugų teikimas. E-valdžia – nauda verslui“. Vilniaus universiteto Tarptautinio verslo mokykla. 2012 lapkričio 9 d., Vilnius, Lietuva.
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24. Balčiūnas A. „Geoportal.lt mokymui(-si)“. GIS dienos renginys Vilniaus Edukologijos universitete. 2012 m. lapkričio 14 d., Vilnius.
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26. Balčiūnas A. „Geoportal.lt for Military purposes“. 17th Baltic Military Geospatial Conference. 2012 m. gruodžio 13–14 d., Vilnius.
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5.6 Access to services through the INSPIRE Geoportal

According to the information provided by stakeholders, access to services through the INSPIRE Geoportal is currently in limited use, mostly in cases where information (metadata) on spatial data sets of other countries is needed to be obtained.

6 Use of the infrastructure for spatial information (Art.14)

6.1 Use of spatial data services in the infrastructure for spatial information

The list of the LSI infrastructure spatial data themes corresponding to the themes referred to in the annexes to the Directive was approved by Resolution No 1460 of 13 October 2010 of the Government of the Republic of Lithuania "On approval of spatial data themes of the Lithuanian infrastructure for spatial information" (*Official Gazette*, 2010, No 123-6297). The list also specified spatial data sets corresponding to those themes and providers of spatial data sets who must provide them to the LSI portal in accordance with the Law of the Republic of Lithuania on Geodesy and Cartography.

It should be noted that the LSI provides not only electronic services involving the use of spatial data sets that belong to the LISI, but also services involving the use of other spatial data sets that are not required to be provided to the infrastructure and do not belong to the LISI, as well as their metadata.

Only services involving provision of the official data sets of the Lithuanian infrastructure for spatial information and related metadata via the LSI portal are discussed further in this chapter.

The LSI portal provides 31 LISI spatial data services—spatial data sets or their metadata accessible through the following network services:

- Search
  During the reference period, the LSI portal provided a total of 39 network services for the search of metadata for spatial data sets. Metadata for spatial data sets are in full compliance with the requirements of the INSPIRE implementing rules.

All metadata are accessible publicly and free of charge through the search service.

During the reference period, the search service of the INSPIRE operational capacity was used on average 1 290 times a year. Other search methods, which are not in line with the requirements of the INSPIRE Directive, are also used much more frequently: access via the pre-arranged and dynamically formed lists of services is used about 160 times a day, i.e. at least 35 000 times a year.

- View (*OGC WMS service*)

During the reference period, the LSI portal provided a total of 31 network services for viewing spatial data sets.

All electronic spatial data viewing services are described by metadata. All metadata are in full compliance with the requirements of the INSPIRE implementing rules.

Spatial data viewing services are accessible publicly and free of charge.

During the reference period, network services of the INSPIRE operational capacity for viewing spatial data sets were provided on average 768 times a year. Other methods for viewing spatial data sets, which are not directly recorded (opening to view without ordering the service), are used much more frequently: on average about 120 times a day at the end of 2012, i.e. at least 26 000 times a year.

- Download (OGC WFS)

During the reference period, the LSI portal provided a total of 18 network services for downloading spatial data sets. All spatial data download services are described by metadata.

Currently, all spatial data download network services are accessible publicly and free of charge.

During the reference period, spatial data download network services were provided on average 2 310 times a year.

- Transformation

During the reference period, the LSI portal provided a total of 18 spatial data transformation network services, for each spatial data download service. All spatial data transformation services are described by metadata.

During the reference period, spatial data transformation network services were provided on average 1 842 times a year.

Transformation services have not been recorded and are not included in this number in cases where no order had been placed (the functionality for changing and exporting the coordinate system to raster format in the map browser of the LSI portal, linked to each viewing service). According to the estimates, this functionality is used in approximately 10 % of viewing cases, i.e. about 2 500 times a year.

Invoke spatial data services are not currently provided by the LSI portal.

The LSI portal provided spatial data network services (search, view, download and transformation) and implements the operational capacity of network services (search, view, download and transformation) specified in the INSPIRE Directive. The goal of the project for the modernisation of the LSI portal "Development of the Services of the Lithuanian Infrastructure for Spatial Information by Implementing Priority Measures of the Directive", which is currently underway, is to achieve full compliance of spatial data network services provided by the LSI portal with the requirements of the INSPIRE Directive.

The users of the services of the LSI portal may use the public access to spatial data. To obtain spatial data, the users of the services of the LSI portal must conclude agreements for the use of spatial data sets with the providers of spatial data sets or their authorised distributors. State cadastre and register management bodies, state and municipal authorities managing spatial data sets have the right to restrict access to spatial data sets where this is stipulated by other laws.

The search and view services provided by the LSI portal are always free of charge. The services for the use of spatial data sets which are needed by the institutions of the European Union, state and municipal authorities to carry out public tasks or to submit reports in accordance with environmental legislation of the European Union are also provided free of charge.

6.2 Use of the spatial data sets

Spatial data sets of the Lithuanian infrastructure for spatial information consist of the spatial data sets collected by state cadastre and register management bodies, state and municipal authorities managing spatial data sets.

Spatial data sets must be created in accordance with the procedure established by the authority authorised by the Government of the Republic of Lithuania and the requirements approved by the European Commission. Spatial data sets must be compiled so that it is possible to collect, manage, store, integrate them with the spatial data sets of the Lithuanian and European infrastructure for spatial information in a systematic manner and in line with the general interoperability requirements, as well as apply them in state cadastres, registers and information systems.

Lithuania follows up on its commitment to provide metadata and spatial data sets to the European infrastructure for spatial information in accordance with the time limits provided. The spatial data sets and related metadata currently available in Lithuania correspond to virtually all INSPIRE themes except the following:

- coordinate reference systems (theme of the Annex I to the Directive): requirements for reference systems are described instead of spatial data sets;
- geographical grid systems, bio-geographical regions, oceanographic geographical features, sea regions—these spatial data themes are not included in the list of spatial data themes of the LSI infrastructure;
- meteorological geographical features and species distribution—metadata for these spatial data of Annex III themes are not currently provided;
- addresses (Annex I theme) and land use, meteorological geographical features and species distribution (Annex III themes)—these spatial data are not currently provided.

During the reference period, the following was provided via the LSI portal:
- 42 spatial data sets for the themes of Annex I to the Directive;
- 23 spatial data sets covering the spatial data themes of Annex II;
- 40 spatial data sets covering the spatial data themes of Annex III.

A total of 105 spatial data sets are provided; part of these sets covers not one but several spatial data themes of the Annexes to the Directive, for example, all or part of the information collected in a georeferenced base cadastre spatial data set of the basic scale 1:10 000 covers ten spatial data themes of Annexes I, II and III to the Directive.

89% of all metadata for spatial data sets provided via the portal (not only those officially included in the list approved by the Government) are accessible through the search service (93% of the metadata for thematic data sets of Annex I, 91% for those of Annex II and 83% for those of Annex III).

76% of all LISI spatial data sets can be accessed by using view services, 54% by using download services and 53% by using both view and download services.

Currently, the most actively used data are the main spatial data—15 spatial data sets, of which the ones most frequently used include the georeferenced base data sets GDR10LT, GDR50LT and

GDR250LT for the territory of the Republic of Lithuania and the 1:10 000 scale digital raster orthophotographic map ORT10LT for the territory of the Republic of Lithuania. These data are regularly used for linkage with other geographic objects in most of the state information systems.

Spatial data sets for land managers and surveyors (12 spatial data sets) are actively used.

There is a high demand for the use of the data on address points and cadastral parcels, but their use is limited by a high price set for the service by the data provider and restrictions on the level of viewing detail.

One of the reasons limiting the implementation of INSPIRE requirements are complicated legal and organisational data sharing procedures. Regulations on information systems of the authorities providing data and other legislation on the provision of data are not always compatible with the principles on the provision of spatial data and related services via the LSI portal. Therefore, it is difficult to harmonise agreements on the provision and use of data. During the reference period, agreements on the provision of data were prepared and harmonised with the Lithuanian Geological Survey, the Lithuanian Hydrometeorological Service under the Ministry of the Environment and Lithuanian municipal administrations.

Currently, spatial data sets provided by the LSI portal are not in compliance with INSPIRE specifications. The goal of the project for the modernisation of the LSI portal, which is undergoing implementation, is to restructure the data sets of the LSI infrastructure to ensure compliance with INSPIRE requirements.

6.3 Use of the infrastructure for spatial information by the general public

Following the launch of the portal, its use was continuously monitored, feedback was collected from its users and analysed, use-related issues were addressed and surveys were conducted. Having summarised the information available, it may be concluded that spatial data services of the LSI portal are important for different groups of users for a variety of reasons and their demand for data and services, as well as the benefits received vary depending on the problems they need to solve.

As in other areas, the highest demand among Lithuanian users is for main spatial data—15 spatial data sets, of which the ones most frequently used include the georeferenced base data sets GDR10LT, GDR50LT and GDR250LT for the territory of the Republic of Lithuania and the 1:10 000 scale digital raster orthophotographic map ORT10LT for the territory of the Republic of Lithuania. These data are regularly used for on-site navigation and informational purposes, also as the basis for the production of thematic maps.

Almost all spatial data sets provided by the LSI portal free of charge are used by the public. A summarised assessment of the use of the data sets by the public and their quality as perceived by the users is presented below, broken down by INSPIRE themes.
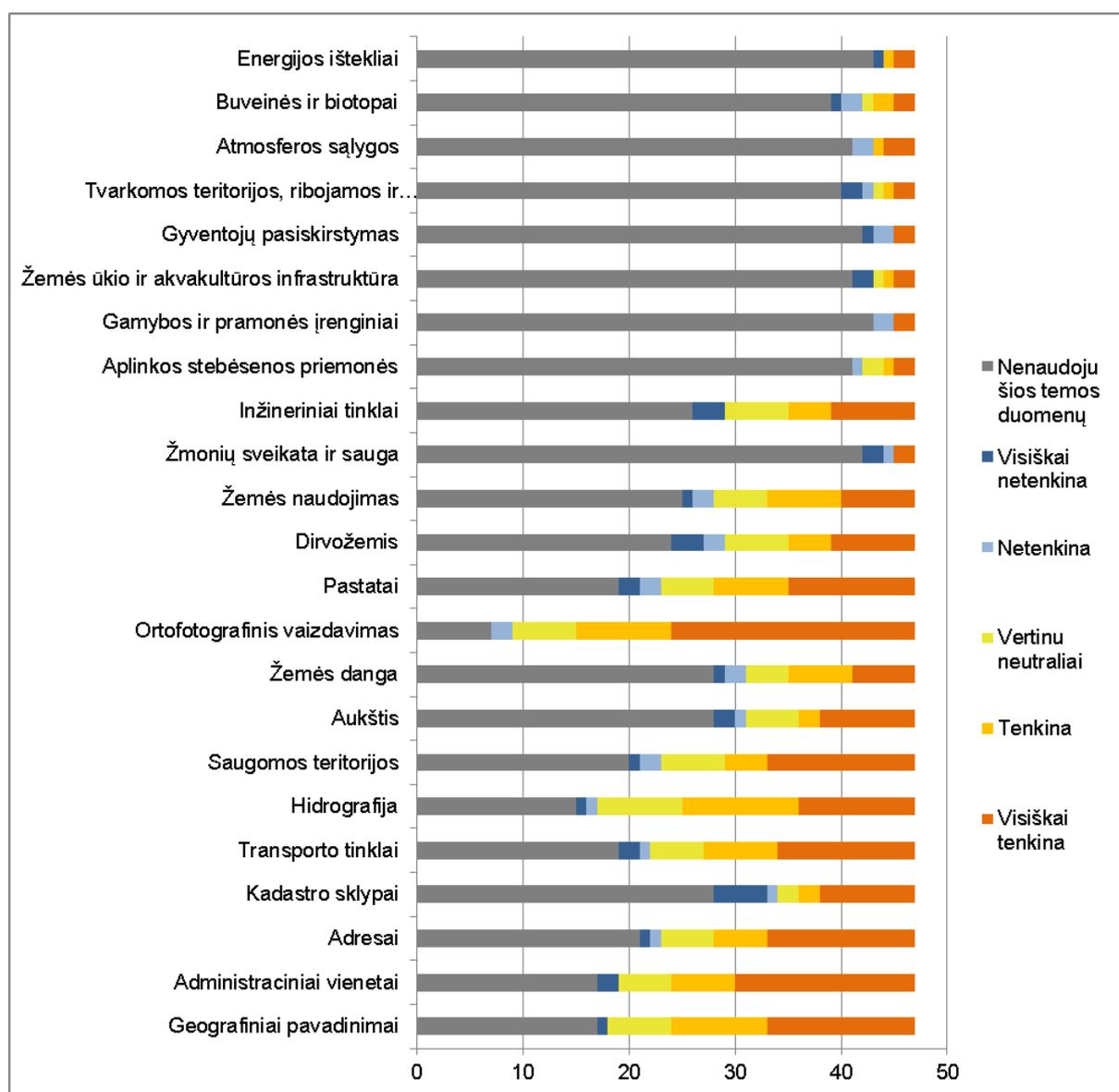
Spatial data themes and quality assessment of the data provided by the LISI

Keys for the graph above
Energijos ištekliai – Energy resources
Buveinės ir biotopai – Habitats and biotopes
Atmosferos sąlygos – Atmospheric conditions
Tvarkomos teritorijos, ribojamos ir reglamentuojamos zonos bei vienetai – Area management/restriction/regulation zones and units
Gyventojų pasiskirstymas – Population distribution
Žemės ūkio ir akvakultūros infrastruktūra – Agricultural and aquaculture facilities
Gamybos ir pramonės įrenginiai – Production and industrial facilities
Aplinkos stebėsenos priemonės – Environmental monitoring facilities
Inžineriniai tinklai – Engineering networks
Žmonių sveikata ir sauga – Human health and safety
Žemės naudojimas – Land use
Dirvožemis – Soil
Pastatai – Buildings
Ortofotografinis vaizdavimas – Orthoimagery
Žemės danga – Land cover
Aukštis – Elevation
Saugomos teritorijos – Protected sites

Hidrografija – Hydrography
Transporto tinklai – Transport networks
Kadastro sklypai – Cadastral parcels
Adresai – Addresses
Administraciniai vienetai – Administrative units
Geografiniai pavadinimai – Geographical names
Nenaudoju šios temos duomenų – I don't use this theme's data
Visiškai netenkina – Completely unsatisfactory
Netenkina – Unsatisfactory
Vertinu neutraliai – Neutral
Tenkina – Satisfactory
Visiškai tenkina – Completely satisfactory

There are several spatial data themes that very rarely get any attention from the users: energy resources, environmental monitoring facilities, atmospheric conditions, area management/restriction/regulation zones and units. Their low rate of use is due to the lack of detailed and relevant data.

Overall, the public has a favourable view of the LSI portal's services and the spatial data provided by the LISI. This is shown by the data from the user opinion survey carried out at the end of 2012, which are presented below.
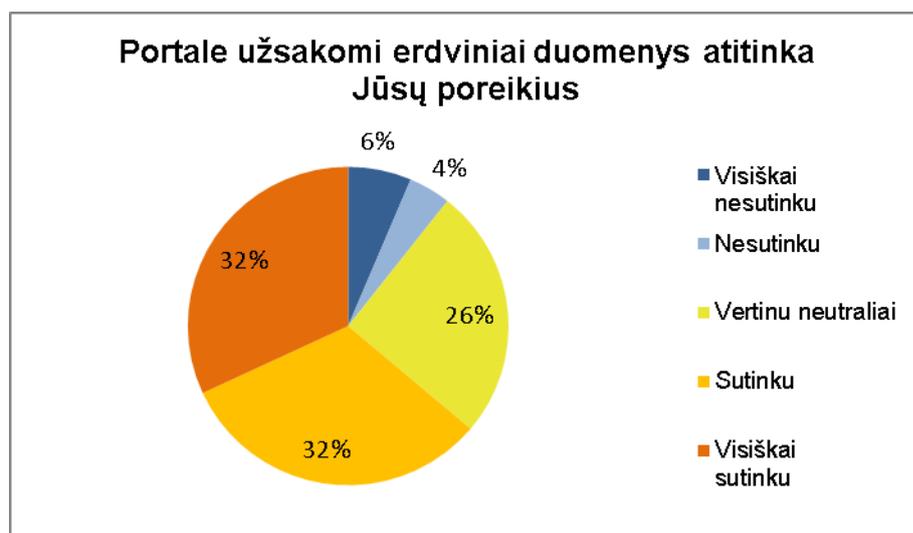
Assessment of whether spatial data ordered through the LSI portal satisfy the needs of Lithuanian users

Keys for the graph above
Portale užsakomi erdviniai duomenys atitinka Jūsų poreikius – Spatial data ordered through the portal satisfy my needs
Visiškai nesutinku – Completely disagree
Nesutinku – Disagree
Vertinu neutraliai – Neutral
Sutinku – Agree
Visiškai sutinku – Completely agree

6.4 Cross-border use

Cross-border use of spatial data sets corresponding to the themes listed in Annexes I, II and III to the Directive and striving to achieve their compatibility is ensured by the NLS by regular participation in EuroGeographics projects for creating common European spatial data products using official state data sets. During these projects, spatial data are harmonised among their providers. The NLS

supports and manages the parts of the *EuroGeographics*-coordinated databases *EuroBoundaryMap*, *EuroRegionalMap* and *EuroGlobalMap* that are related to the territory of the Republic of Lithuania. The State Service for Protected Areas under the Ministry of the Environment provides and uses the data for *NATURA 2000* sites. Lithuania is involved in *CORINE Land Cover* projects organised by the European Environment Agency, it is also developing and updating its land cover GIS database, which is incorporated in the common European land cover digital map. The Lithuanian Geological Survey is involved in the international project *One Geology Europe* which seeks to create a single electronic geological map of Europe.

The Lithuanian Maritime Safety Administration has agreements with hydrographic agencies and services of other countries (the United Kingdom, Germany).

Other stakeholders indicated in the 2012 survey that they do not use the spatial data of other countries.

6.5 Use of transformation services

Spatial data transformation network services provided by the LSI portal are used to achieve compatibility between available spatial data sets.

Transformation network services are closely linked to spatial data download network services, i.e. LISI spatial data downloaded through the LSI portal can be transformed into the desired data format and coordinate system.

For example, vector spatial data may be transformed into file formats offered by the main manufacturers (ESRI, MapInfo, Autodesk): ESRI Shape, ESRI file or personal geodatabases, MapInfo MIF, MapInfo TAB, Autodesk AutoCAD DWG/DXF, Bentley MicroStation Design. Moreover, vector spatial data sets may be obtained in EPS file format suitable for printing. Downloaded raster spatial data may be transformed and obtained in the following formats: ESRI ASCII Grid, MR SID, Leica Geosystems ERDAS IMAGINE, GIF, JPEG, TIFF, PNG, etc.

LISI spatial data coordinate systems ordered via the LSI portal may be transformed into selected coordinate systems: LKS-94/Lithuania TM; WGS 84; ETRS 89/TM Baltic 93; Pulkovo 1942/Gauss Kruger CM 21, etc.

During the reference period, the LSI portal provided a total of 18 spatial data transformation network services corresponding to spatial data download services. All spatial data transformation services are described by metadata, and these metadata are in full compliance with the requirements of the INSPIRE implementing rules. All metadata for spatial data sets are accessible through the search service. During the reference period, spatial data transformation network services had been provided for a total of 1 842 times a year.

Spatial data transformation network services provided by the LSI portal are not currently in full compliance with INSPIRE requirements. One of the objectives in implementing the project "Development of the Services of the Lithuanian Infrastructure for Spatial Information by Implementing Priority Measures of the Directive" is re-organisation of the transformation network service provided by the LSI portal in line with the requirements of the INSPIRE implementing rules.

7 Data sharing agreements (Art.15)

7.1 Data sharing agreements between public authorities

The main provisions of the Law on the Management of State Information Resources concerning provision of information including spatial data to authorities and other legal and natural persons are as follows:
> 1.   information under the control of an authority shall be public and shall be provided to authorities and other legal and natural persons in accordance with the procedure provided for

by the laws of the Republic of Lithuania, European Union legislation and/or other legislation unless otherwise provided by the laws of the Republic of Lithuania or European Union legislation;

2.   submission of information to authorities and other legal or natural persons may be limited only by the laws of the Republic of Lithuania and/or European Union legislation;

3.   Information under the control of an authority that is processed by state information systems shall be provided to the natural and legal persons of the Member States of the European Union and/or the Member States of the European Economic Area, entities without legal personality, and branches and representative offices thereof under the same procedure as to the legal and natural persons of the Republic of Lithuania. Information under the control of an authority that is processed by state information systems shall be provided to the natural and legal persons of the third countries, entities without legal personality and branches and representative offices thereof under the same procedure as to the legal and natural persons of the Republic of Lithuania where this is not contrary to the laws of the Republic of Lithuania, international agreements and other legislation.

Data sharing between state and municipal authorities is governed by regulations on relevant information systems where external spatial data flows and their sources are specified. Agreements on the provision of data are reached by harmonising the regulations on information systems among all managers of information sources referred to in the regulations. Specific agreements between authorities are signed after the details of data provision have been harmonised. Agreement forms are individual depending on the nature of data services required; there are several hundred valid agreements between stakeholders in Lithuania. Agreements typically specify the subject matter of the agreement, legal basis for the provision of data, obligations of the parties, as well as regulate data protection, etc.

State and municipal authorities provide information by authorised access through the internet or other electronic communication networks, transfer data automatically through electronic communication networks, as well as provide information under their control in written and oral form and/or through electronic means of communication. When providing data, the authority is forbidden to require acquisition of specialised paid software. Recommended data provision formats and standards ensuring interoperability between state information systems or registers and usage thereof are established by the authority responsible for the functional compatibility, creation, management and development of state information resources.

State and municipal authorities publish information on what information is under their control, as well as the possibilities of and conditions for the use of this information on their websites.

Information processed by state information systems is provided to the requesting authorities, other legal and natural persons free of charge unless otherwise provided by the laws of the Republic of Lithuania or European Union legislation. With the help of the systems of the LSI portal, more spatial data sets are provided without any administration fee.

The list of the LISI spatial data themes corresponding to the themes referred to in the annexes to the Directive was approved by Resolution No 1460 of 13 October 2010 of the Government of the Republic of Lithuania "On approval of spatial data themes of the Lithuanian infrastructure for spatial information" (*Official Gazette*, 2010, No 123-6297).

According to this list, most of the spatial data sets are provided to all users of the electronic services of the LSI portal publicly and free of charge through the electronic services of the LSI portal. Search and view services of the LSI portal are provided free of charge. Download and transformation services of the LSI portal are provided free of charge unless otherwise provided by laws.

Agreements on the use of data concluded with the users of the electronic services of the LSI portal (an agreement which, in the instances laid down by the Regulations, is concluded between the Portal Administrator and the User of the Portal's Services and which set out the conditions for the use of a specific spatial data set through the network services of the Portal) are harmonised with the provider of the spatial data set and may be concluded in the following ways:

1.   by choosing the option "I agree" where, at the time of ordering a spatial data set, the user of the Portal's services confirms his/her identity through the VAIISIS and, by clicking "I agree",

confirms that he/she understands and agrees with the conditions of the agreement on the use of data and/or agreement for the provision of electronic services of the Portal, as described in the Portal;

2.   by choosing the option "I agree", without confirming the identity of the user of the Portal's services but confirming that he/she understands and agrees with the conditions of the agreement on the use of data and/or agreement for the provision of electronic services of the Portal, as described in the Portal;

3.   by electronic signature verified by a qualified certificate.

Parameters for the agreements on the use of data are set automatically and stored in the database. Agreement documents are stored in the data management system.

7.2 Data sharing agreements between public authorities and Community institutions and bodies

Insofar there are no data sharing agreements between Community institutions and bodies and the manager or administrator of the LSI portal. According to the provisions of the Law of the Republic of Lithuania on Geodesy and Cartography, spatial data sets and services which are needed by the institutions of the European Union, state authorities and municipalities to carry out public tasks or to submit reports in accordance with environmental legislation of the European Union are provided free of charge. Providers of spatial data sets have the right to restrict access to spatial data sets via the LSI portal where this is stipulated by other laws. Community institutions and bodies may use electronic services of the LSI portal under the same procedure as they are used by legal and natural persons in Lithuania, by signing such agreements on the use of data as provided for a specific spatial data set provided through the electronic service of the LSI portal. Conditions of the agreements on the use of data are presented in English.

7.3 Barriers to the sharing of spatial data sets and related services between public authorities and a description of actions taken to eliminate such barriers

No issues have been experienced in providing metadata. The procedure for the provision and update of metadata is clearly defined in the agreements on the provision of metadata via the LSI portal.

Neither do any issues usually arise with bilateral cooperation agreements, or else they are of technical nature and easily solved. Most issues are caused by restricted access to certain data, which are important for stakeholders. Excessive charges for the preparation of very frequently used spatial data (addresses and parcels) provided by the State Enterprise Centre of Registers are often named as a use-limiting issue.

The main issue with the provision of data is that no funds have been earmarked for ensuring the compatibility of the spatial data of Community States. Internal resources of the state are not sufficient to ensure both internal exchange of spatial data for national needs and a good level of provision of such data to Community institutions and bodies. The issue is addressed by trying to harmonise national needs with INSPIRE requirements as much as possible.

Regulations on state cadastres, registers and information systems establish the procedure for the provision of data which is not always suited for the provision of electronic data (agreements and licences required, inflexible pricing).

This complicates the alignment of the conditions for the provision of data and the signing of agreements. The necessary amendments to legislation are planned to be made, but it is a lengthy process. Many stakeholders, however, emphasise that the LSI portal enables a much more effective and efficient exchange of these data sets.

Data providers, in particular municipal administrations, often lack resources to be able to provide data in accordance with the LISI and INSPIRE requirements. Due to the incompatibility of spatial data specifications, it is impossible to fully automate data sharing. Therefore, it may be difficult to ensure a good level of the provision of data. This issue is addressed by the manager and the administrator of the LSI portal by presenting data providers with precise procedures as well as with metadata and unified data provision tools.

8   Cost / Benefit aspects (Art.16)

8.1   Costs resulting from implementing Directive 2007/2/EC

Costs of implementing the Directive are hard to separate from the costs of LISI development and maintenance and development of the LSI portal systems. Therefore, the costs incurred during the reference period are divided into two parts:

    1.   costs directly related to the compliance of the network services, metadata and spatial data sets of the LSI portal with the INSPIRE requirements. They are incurred periodically, by implementing special projects. It is considered that the full scope of such a project is used to implement the Directive;

    2.   maintenance costs of the LSI portal incurred annually by the LISI stakeholders and covering the following categories:

        2.1 hardware maintenance costs;

        2.2 software maintenance costs;

        2.3 maintenance work costs;

        2.4 monitoring and reporting costs.

Maintenance costs would be difficult and not very logical to break down into those that are more related or less related to the implementation of the Directive. It is obvious that it would be impossible to implement the Directive without maintaining the information systems of the LSI portal and data providers. On the other hand, a substantial proportion of the maintenance costs is, after all, intended to meet national needs which are not limited by the implementation of the INSPIRE requirements. Therefore, it was decided to present the costs of implementation of the Directive as the costs of the manager and the administrator of the LSI portal, not including the maintenance costs of the systems of LISI data providers all the more so because the costs declared by different data providers vary considerably depending on the method of assessment of the INSPIRE share of the costs. Costs of data providers related to the creation and provision of spatial data sets and their metadata were included where such costs had been declared by the data provider.

Maintenance costs related to IT infrastructure are not broken down into target components (metadata, network services or implementation of other requirements) because all systems of the LSI portal are integrated and used together.

Project work costs are calculated by evaluating the average daily salary of an employee or an expert at the end of 2012 and the number of working days required to perform the project's tasks; maintenance work costs are calculated on the basis of salaries effectively paid.

One-off costs directly related to the compliance of the network services, metadata and spatial data sets of the LSI portal to the INSPIRE requirements

IT infrastructure, for which components were acquired by using the Structural Funds' assistance for the LISI development project, was in use until 2012. LTL 16.5 million was invested in the development of the LISI over the period from 2005 to 2009 (LTL 6.9 million in IT infrastructure and LTL 9.6 million in system analysis, design, programming, testing and installation in the organisations of the administrator of the LSI portal and LISI data providers).

The scope of the project for the development of the LSI portal carried out in 2012–2014 includes upgrading and development of the IT infrastructure (one-shot investment in complex upgrade and development):

No	Investment	Amount, LTL

1.		IT infrastructure	2 866 496
	1.1	Hardware	592 690
	1.2	Newly-acquired and updated software	2 273 806
2.		System design and programming services provided within the scope of the ongoing project for the development of the LSI portal	2 746 700
3.		Project administration and supervision, publicity	834 500
		Total	6 447 696

Maintenance costs of the LSI portal indirectly related to the implementation of INSPIRE

Each year, the manager and the administrator of the LSI portal allocate, on average, LTL 1 million to the maintenance of the LSI portal and the various activities for the implementation of INSPIRE. The structure of these costs is presented below, indicating an estimated share for the implementation of the Directive (i.e. the share of costs that could be foregone if not for the implementation of the Directive).

No		Category of costs	Average costs over the years 2010–2012, LTL	The share of costs directly related to the implementation of the Directive, %
1.		**IT infrastructure**	**337 000**	
	1.1	Hardware maintenance	74 000	20
	1.2	Software maintenance	36 000	50
	1.3	Infrastructure costs	227 000	
2.		**System supervision and administration costs**	**615 000**	
	2.1	Creation and management of metadata	100 000	50
	2.2	Maintenance and management of the data sets to be harmonised	200 000	90
	2.3	Administration and maintenance of network services	300 000	50
	2.4	Monitoring and reporting	5 000	90
	2.5	User information and consultation	10 000	30
3.		**Coordination and organisation**	**80 000**	
	3.1	Coordination of INSPIRE implementation activities	20 000	100
	3.2	Participation of Lithuanian experts in INSPIRE development processes	10 000	100
	3.3	Periodical training	30 000	50
	3.4	Publicity and information	20 000	50
		Total	**1 032 000**	

LISI data providers indicate relatively low annual costs additionally incurred as a result of the implementation of the Directive, mostly in three categories:

1. preparation for provision and update of metadata and network services (LTL 2 000–20 000 each year depending on the volume of the data provided);

2. management of data sets (during the reference period, these costs were minimal as compliance of the existing spatial data sets with the INSPIRE requirements was not specifically sought);

3. monitoring and reporting (LTL 2 000–5 000 each year).

8.2 **Benefits observed**

The benefits, as well as the costs of the implementation of the Directive, are inseparable from the benefits provided by the LISI and the LSI portal. Any claims regarding the possible development of the national spatial data infrastructure without the Directive would be speculative. The idea of the Directive—and later its entry into force—exerted a definite influence, as early as in the initial stages of preparation, on decision-making concerning the management and common use of spatial data sets in Lithuania. Breaking down of the benefits observed into categories is conditional.

Benefits directly related to the INSPIRE Directive (i.e. it is likely that they would not have been achieved without the Directive). These are, of course, only indirect and non-quantifiable benefits characterised by the following aspects:
1. The Directive created legal presumptions for pursuing interoperability and common use of spatial data. This made it easier to conclude relevant agreements with spatial data providers, define data sharing practices and procedures and move more information and services online. Without the Directive, the process involving amendment of existing legislation and adoption of new legislation necessary for the effective management of spatial data would be much slower.
2. The Directive creates an obligation to provide metadata, i.e. inform users about the existing spatial data sets. As a result of implementation of this requirement, the awareness of the authorities and the public to the existence of information resources collected by the state has increased manifold.
3. INSPIRE promotes public provision and monitoring of data. Since public provision of data sets and easy access enable users to notice their weaknesses, this suggests that, in the absence of legal obligations, some data providers would not be interested in disclosing their data sets.

Evidence of direct benefits observed in Lithuania:
- adoption of the Directive led to focused policy-making in the field of spatial information;
- benefits observed in the field of environmental policy: obligation to put in order the existing data, collect new spatial data and provide modern spatial data services;
- the understanding among the authorities of the benefits of spatial information, integration of data on the basis of spatial data and the possibilities of using them in decision-making has improved. Thus the groundwork is laid for closer cooperation among organisations;
- the public is better informed and the demand for spatial data services is increasing;
- more projects are prepared, there is an emergence of initiatives related to broader use of spatial data and innovative electronic services. The legal basis created by the Directive allows better justification of the demand for such projects and ensures their funding.

To sum up, Lithuania has seen a regular increase in the use of existing spatial information in all sectors of activity, a growing demand for exhaustive, relevant and interoperable information and the users' interest in cooperation in the field of creation and use of spatial data. The public's geographic literacy is on the rise, and not only the LSI portal is more actively used but also Google Maps, maps.lt and other online maps. An increased supply of services in the field of GIS is felt on the labour market, which makes it easier for professionals to find work. Study programmes related to the use of GIS technologies and the science of geographic information are in the course of being updated; therefore, better training of professionals in this field may be expected in the future.

Apart from the above-mentioned benefits, some LISI data providers indicate small additional economic benefits generated from the implementation of the Directive, which are mostly indirect, as described below. For some of the data providers, implementation of the Directive is associated with costs only.

Starting to provide spatial data sets of different spatial data providers through the single centralised LSI portal brought to light some issues with spatial data quality and compatibility; this is related to higher demand for data administrator resources to address these issues and the demand for better legal regulation of the use of data.

The second beneficial aspect: benefits generated by the LISI

This includes economic and social benefits generated at the national level as a result of the functioning of the infrastructure for spatial information. Since implementation of the Directive speeds up the development of the infrastructure for spatial information and necessitates an increase in its efficiency, there is no doubt

that a certain part of these benefits is linked to the Directive but it is impossible to provide quantifiable evidence of this link. Estimates of employee time savings are based on consultations with project partners, municipalities, experts of the State Enterprise Centre of Registers, surveyors, scientists of Vilnius University and Vilnius Gediminas Technical University. Assessments of the common benefits generated by the LISI are presented below.

1. Economic benefits achieved as a result of increased efficiency. These benefits are primarily quantified in work time costs; by multiplying these costs by an average salary of an employee from a relevant field, an expression of these benefits in financial terms may be obtained; however, it must be noted that work time saving does not in itself guarantee financial benefits, thus it cannot be classified as direct benefits.
- Citizens' time is saved as a result of transferring spatial data search and view services online.
- Time needed to obtain spatial data and their updates is saved for the users of all national data provided by the LSI portal because spatial data sets may be accessed by internet.
- Some of the problems related to the use of spatial information can be solved online by using the tools and specialised services of the LSI portal, thus saving the time of surveyors, employees of land management departments, as well as the time of the employees of other state and municipal authorities and the funds for the acquisition and mastering of GIS equipment and/or solutions.
- Costs are saved on development and integration of solutions based on spatial information technologies in the state information systems, which use the functionality of the LSI portal, for example, data analysis and benchmarking tools of the Land Information System in the LSI portal.

According to the cost-benefit analysis of the implementation of the Directive, at least 10 000 working days of time had been saved nationally each year over the period 2010–2012 as a result of functioning of the LISI. This indicator has an annual growth rate of 5–10%.

2. Indirect benefits achieved as a result of greater use of spatial data and existing LISI tools for decision-making. Where decision-makers are better informed, this leads to less problems and arguments, and the resulting financial and time costs are reduced. Examples of such benefits are as follows:
- improved availability and transparency of spatial data sets resulted in a smaller number of territorial pre-litigation disputes and legal proceedings arising out of the incompatibility of spatial data sets;
- with the land owners being able to view parcel data online, they are better informed, resulting in lower volumes of administration of fines for abandoned land and more effective resolution of issues concerning the use (restitution) of land;
- more effective registration of errors and a smaller number of related errors in spatial data sets;
- much lower rates of duplication of spatial data sets (it is unnecessary to keep copies when they are available online) and no need for repeated efforts to collect similar data sets.

2. Indirect benefits achieved as a result of increased use of spatial information to create various services and new spatial data sets. Examples of such benefits are as follows:
- higher number of ongoing projects for the development of spatial information systems, greater demand for professionals, new jobs;
- new spatial data sets are created by using the main national spatial data sets, thereby conferring added value to the collected information, for example, maps displaying the distribution of criminal offences, tourist routes, objects of folklore and literature;
- users create spatial data sets by crowdsourcing, for example, error or issue notifications, alternative tourism sites.

3. Indirect social benefits primarily linked to improved awareness and motivation at all levels:
- strengthened cooperation between different organisations by using the same spatial data as an instrument for interconnection;
- qualitatively new possibilities for using spatial information, increasing number of creators of spatial data and added-value services, especially among educational institutions; less investments in hardware and software and more investments in innovative products;
- better citizens' awareness of the living and business environment, ability to use spatial analysis tools and more active participation in decision-making; better awareness of officials is linked to expected higher rates of "good" decisions (i.e. fully justified decisions taking account of the more influential environmental factors).

To summarise, although individual organisations have not yet achieved a good level of understanding of the benefits of INSPIRE, the benefits of implementation of the Directive at the national level have far outweighed the costs.

9 Conclusions

A methodological and technological basis of the infrastructure for spatial information has been created and legitimised in Lithuania and there is an operational LSI portal (www.geoportal.lt), which provides access to the metadata of national spatial data sets, as well as spatial data sets and related services. There is an ongoing regular cooperation between stakeholders, as a result of which an increasing number of spatial data sets become available to users publicly and free of charge.

Metadata for spatial data sets referred to in Annexes I, II and III to the INSPIRE Directive that correspond to the national metadata profile of Lithuania are currently available to users via the LIGI portal and are in full compliance with the INSPIRE requirements.

Network services were being provided and the operational capacity was implemented as early as in 2010. Search, view, download and transformation services are provided.

Digital spatial data sets currently available in Lithuania cover virtually all INSPIRE themes, except the following:
- oceanographic geographical features;
- sea regions;
- bio-geographical regions.

New official spatial data sets had not been created and the existing ones had not been restructured in 2010–2012. Therefore, currently provided spatial data are not in compliance with the INSPIRE data specifications but meet national needs. The formation and provision of data sets in line with the specifications for the INSPIRE data themes I and II is planned for in 2013–2014.

The years 2010–2012 saw rapid growth in the number of users of the services of the LSI portal, as well as the use of the services, which continues in 2013.

The project "Development of the Services of the Lithuanian Infrastructure for Spatial Information by Implementing Priority Measures of the Directive" (No VP2-3.1-IVPK-06-V-02-002), which is financed from the EU Structural Funds under the implementing measure "Interoperability" for Priority 3 "Information Society for All" of the Operational Programme for Economic Growth, is underway in 2012–2014. The expected project results are as follows:
1. search, view, download and transformation services provided at www.geoportal.lt in line with the interoperability (efficiency, capacity and accessibility) requirements established in the Directive's implementing rules as applicable until 30-12-2012, as well as the requirements for INSPIRE network services;
2. transformation services allowing provision of data sets referred to in Annexes I and II to the INSPIRE Directive in line with the INSPIRE specifications;
3. spatial data sets and their metadata provided via the LSI portal that best comply with the INSPIRE specifications.

Upon the achievement of these results, the e-services of the LSI portal can be transformed into services that are in full compliance with the requirements of the Directive's implementing rules. Thus the project will create a favourable environment for spatial data managers who must provide their spatial data to the Community but do not have the necessary equipment or skills to do it or are unwilling to make additional investments in the provision of data. In the course of implementing the project in 2013–2014, the LSI portal systems are updated, which will ensure faster and more stable operation. This is very important not only for the INSPIRE data providers, but also for all users of the LSI portal. It is likely that, upon the completion of the project, the LISI will be used even more actively and greater economic benefits will follow.

Annexes

9.1   List of organisations: names and contact details

1. National Land Service under the Ministry of Agriculture (www.nzt.lt), Gedimino Ave. 19, LT-01103 Vilnius, phone: +370 (5) 239 1307, fax: +370 (5) 239 1331, e-mail: nzt@zum.lt.
2. Ministry of the Environment (www.am.lt), Jakšto St. 4/9, LT-01105 Vilnius, tel. +370 (5) 266 3661, fax. +370 (5) 266 3663, e-mail: info@am.lt.
3. Environmental Protection Agency (http://aaa.am.lt/), A. Juozapavičiaus St. 9, LT-09311 Vilnius, phone: +370 (5) 2662808, fax: +370 (5) 2662800, e-mail: aaa@aaa.am.lt.
4. State Forest Service under the Ministry of the Environment (http://www.lvmi.lt/vmt/), Pramonės Ave. 11ᵃ, LT-51327 Kaunas, phone: +370 (37) 490 220, fax: +370 (37) 490 251, e-mail: vmt@lvmi.lt.
5. Lithuanian Geological Survey under the Ministry of the Environment (http://www.lgt.lt/), S. Konarskio St. 35, LT-03123 Vilnius, phone: +370 (5) 233 2889, fax: +370 (5) 233 6156, e-mail: lgt@lgt.lt.
6. State Service for Protected Areas under the Ministry of the Environment (http://vstt.lt), A.Juozapavičiaus St. 9, LT-09311 Vilnius, phone: +370 (5) 272 3284, fax: +370 (5) 272 2572, e-mail: vstt@vstt.lt.
7. Lithuanian Hydrometeorological Service under the Ministry of the Environment (www.meteo.lt), Rudnios St. 6, LT-09300 Vilnius, phone: +370 (5) 275 1194, fax: +370 (5) 272 8874, e-mail: lhmt@meteo.lt.
8. State Enterprise Centre of Registers (http://www.registrucentras.lt/), V.Kudirkos St. 18, LT-03105 Vilnius, phone: +370 (5) 268 8202, fax: +370 (5) 268 8311, e-mail: info@registrucentras.lt.
9. Lithuanian Road Administration under the Ministry of Transport and Communications (http://www.lra.lt/), J.Basanavičiaus St. 36/2, LT–03109 Vilnius, phone: +370 (5) 232 9600, fax: +370 (5) 232 9609, e-mail: lakd@lakd.lt.
10. Fire and Rescue Department under the Ministry of the Interior (http://www.vpgt.lt/), Švitrigailos St. 18, LT-03223 Vilnius, phone: +370 (5) 271 6866,   fax: +370 (5) 216 3494, e-mail: pagd@vpgt.lt.
11. Department of Statistics under the Government of the Republic of Lithuania (http://www.stat.gov.lt), Gedimino Ave. 29, LT-01500 Vilnius, phone: +370 (5) 236 4800, fax: +370 (5) 236 4845, e-mail: statistika@stat.gov.lt.
12. Department of Cultural Heritage under the Ministry of Culture (http://www.kpd.lt), Šnipiškių St. 3, LT-09309 Vilnius, phone: +370 (5) 273 42 56, fax: +370 (5) 272 40 58, e-mail: centras@heritage.lt.
13. Lithuanian Maritime Safety Administration (http://www.msa.lt), J.Janonio St. 24, LT-92251, Klaipėda, phone: +370 (46) 469 602, fax: +370 (46) 469 600, e-mail: msa@msa.lt.
14. State Territorial Planning and Construction Inspectorate under the Ministry of the Environment (http://www.vtpsi.lt/), A. Juozapavičiaus St. 9, LT-09311 Vilnius, phone: +370 (5) 272 2748, fax: +370 (5) 272 3620, e-mail: info@vtpsi.am.lt.

9.2   List of references for the compilation of the report

1. Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) (OJ 2007 L 108, p. 1).
2. Commission Regulation (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata (OJ 2008 L 326, p. 12).
3. Commission Decision (EC) No 442/2009 of 5 June 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting (OJ 2009 L 148, p. 18).
4. Commission Regulation (EC) No 976/2009 of 19 October 2009 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the Network Services (OJ 2009 L 274, p. 9) and Commission Regulation (EU) No 1088/2010 of 23 November 2010

amending Regulation (EC) No 976/2009 as regards download services and transformation services (OJ 2010 L 323, p. 1).

5. Commission Regulation (EU) No 268/2010 of 29 March 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the access to spatial data sets and services of the Member States by Community institutions and bodies under harmonised conditions (OJ 2010 L 83, p. 8).

6. Law of the Republic of Lithuania on Geodesy and Cartography (*Official Gazette*, 2001, No 62-2226; 2010, No 54-2649).

7. Law of the Republic of Lithuania on Real Estate Cadastre (*Official Gazette*, 2000, No 58-1704; 2003, No 57-2530).

8. Law of the Republic of Lithuania on the Management of State Information Resources (*Official Gazette*, 2011, No 163-7739).

9. Resolution 911 of 10 September 2008 of the Government of the Republic of Lithuania "On appointment of the authorities responsible to ensure the implementation of Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007" (*Official Gazette*, 2008, No 109-4157; 2009, No 116-4940).

10. Resolution No 1460 of 13 October 2010 of the Government of the Republic of Lithuania "On approval of spatial data themes of the Lithuanian infrastructure for spatial information" (*Official Gazette*, 2010, No 123-6297)**.**

11. Order No 3D-344 of 18 April 2011 of the Minister for Agriculture of the Republic of Lithuania "On approval of the procedure for the provision of information required for monitoring, as well as preparation and submission of reports to the European Commission" (*Official Gazette*, 2011, No 48-2318).

12. Order No 1P-(1.3.)-295 of 30 August 2012 of the Director of the National Land Service under the Ministry of Agriculture "On approval of the requirements for metadata of the Lithuanian infrastructure for spatial information and of the procedure for the provision of metadata of the Lithuanian infrastructure for spatial information" (*Official Gazette*, 2012, No 106-5401).

13. Order No 1P-(1.3.)-91 of 7 March 2012 of the Director of the National Land Service under the Ministry of Agriculture "On approval of the Regulations for the Lithuanian spatial information portal and the Data Security Regulations for the Lithuanian spatial information portal" (*Official Gazette*, 2012, No 31-1485).

14. Regulations of the National Land Service under the Ministry of Agriculture approved by Order No 194 of 14 June 2001 of the Minister for Agriculture (*Official Gazette*, 2001, No 52-1852; 2008, No 150-6122).

15. Rules on the Establishment and Legitimisation of State Information Systems approved by Resolution No 451 of 19 April 2004 of the Government of the Republic of Lithuania (*Official Gazette*, 2004, No 58-2061).