



# Spatial Data Infrastructures in Luxembourg: State of play 2010



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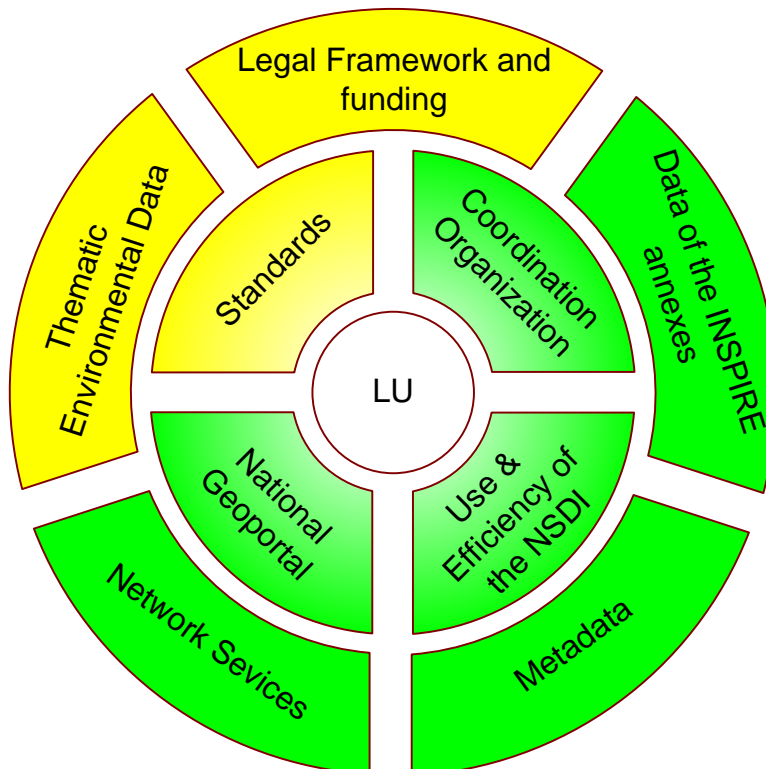
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4.0	2003-07-25	Margaret Hall	Addition of executive summary, abbreviations and acronyms
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11.1	2010-07-22	Katleen Janssen (ICRI)	2009 update of the legal framework

## Change matrix 2010 versus 2007

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



## Executive summary

Already in 1992, the need for coordination, sharing and re-use of spatial data in the Luxembourg administration has been recognized and has resulted in the –informal– creation of the Interministerial working group on GIS (GTIM-SIG). This working group is still active today and operates as a consultative body for the Administration du Cadastre et de la Topographie (ACT) which acts as the de facto executive body for the GTIM-SIG.

In 2009 the government took the official decision to have the national SDI created, and entrusted ACT with the coordination, organisation and management of this infrastructure. Funds were made available to implement a dedicated workforce in a dedicated department at ACT.

ACT is operating a new geo-portal providing metadata and data ordering services for a number of datasets. An INSPIRE catalogue also exist in the geoportal. Metadata are following the ISO 19115 standards.

The **main tasks** of the administration of the cadastre and topography (ACT) can be divided into three main parts.

- The creation, management, updating and dissemination of land documentation and cartographic officials of Luxembourg.
- Cadastral surveying in the Grand Duchy, regulated by the law of 25 July 2002, establishing and regulating the profession of surveyors and surveying officials.
- Management of national geodetic networks .

Moreover, Luxembourg has finalised a draft INSPIRE implementation law text which currently is on its institutional route.

## Table of Contents

<b>CHANGE MATRIX 2010 VERSUS 2007 .....</b>	<b>4</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>5</b>
<b>TABLE OF CONTENTS .....</b>	<b>6</b>
<b>ABBREVIATIONS AND ACRONYMS.....</b>	<b>7</b>
<b>1. GENERAL INFORMATION.....</b>	<b>8</b>
1.1 METHOD .....	8
1.2 MAJOR ACTORS ON THE SDI-SCENE IN THE G.D.LUXEMBOURG.....	8
<b>2 DETAILS OF ACT / GTIM-SIG .....</b>	<b>10</b>
2.1 GENERAL INFORMATION .....	10
2.2 COMPONENT 1: COORDINATION AND ORGANIZATIONAL ISSUES .....	10
2.3 COMPONENT 2: LEGAL FRAMEWORK AND FUNDING.....	13
2.4 COMPONENT 3: DATA FOR THEMES OF THE INSPIRE ANNEXES.....	16
2.5 COMPONENT 4: METADATA .....	19
2.6 COMPONENT 5: NETWORK SERVICES.....	21
2.7 COMPONENT 6: THEMATIC ENVIRONMENTAL DATA .....	25
2.8 STANDARDS .....	25
2.9 USE AND EFFICIENCY OF SDI .....	26
<b>3 ANNEXES.....</b>	<b>27</b>
3.1 LIST OF SDI ADDRESSES / CONTACTS FOR LUXEMBOURG .....	27
3.2 LIST OF REFERENCES FOR LUXEMBOURG .....	28

## Abbreviations and acronyms

ACT	Administration du Cadastre et de la Topographie
ASTA	Administration des Services Techniques de l'État
BDN-SIT	Banque de Données Nationale - Système d'Information du Territoire
CIE	Centre Informatique de l'Etat
CLEAR	Spatial data clearinghouse for Sar-Lor-Lux
CS	Catalogue Service
CT	Core Thematic Data
CTIE	Centre des Technologies de l'Information de l'Etat
ETC/CDS	European Environment Agency's Topic Centre for Catalogue of Data Servers/Sources
EUROGI	European Umbrella Organisation for Geographic Information
GI	Geographical Information
GIS	Geographical Information System
GTIM-SIG	Group de Travail Interministeriel – Système d'Informations Géographiques
GTIM	Groupe de Travail Interministériel
ILDG	Infrastructure Luxembourgeoise de Données Géographiques
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
ISO	International Organization for Standardization
LSDI	Luxembourg Spatial Data Infrastructure
LUREF	Lux Reference
MNHN	Musée National d'Histoire Naturelle
MIS	Metadata Information System
NSDI	National Spatial Data Infrastructures
OGC	Open GIS Consortia
PCN	Plan Cadastral Numérique
PPP	Public-Private Partnerships
PSI	Policy and legislation on access to public sector information
REF	Reference data
SDI	Spatial Data Infrastructures
SMEs	Small and Medium sized Enterprises
WCS	Web Coverage Service
WFS	Web Feature Server
WMS	Web Map Server

# 1. GENERAL INFORMATION

## 1.1 Method

This report is summarizing the review of SDI in the Grand Duchy of Luxembourg, and reflects the degree to which the SDI situation is similar to the ideas set out in the INSPIRE position papers<sup>1</sup> and in the more recent INSPIRE scoping papers.

The 2002 report was based mainly on the analysis of web sites and other documents readily accessible:

- [www.etat.lu/ACT](http://www.etat.lu/ACT)
- [http://katla.giub.uni-bonn.de:9673/web/index\\_html?theme=projects&item=MISLux&subitem=none](http://katla.giub.uni-bonn.de:9673/web/index_html?theme=projects&item=MISLux&subitem=none)
- <http://www.lat-lon.de/projekte.html>

The previous versions of this report have not received comments from Luxembourg experts. For the update of 2005, the INSPIRE experts of Luxembourg did not give specific input but confirmed that nothing has changed over the last year (2004-2005). Information on the PSI Directive has been integrated from other sources. In 2006, SADL updated only the legal section on the PSI. No other information was obtained. For the 2007 update information was received regarding the functioning of the SDI and the data sets and services.

For the 2009 update the various web sources, publications and the geoportal was used to gather information. In this version obsolete information was removed, while a conclusion paragraph regarding the status of each indicator was added for each component.

## 1.2 Major actors on the SDI-scene in the G.D.Luxembourg

The *Groupe de Travail Interministériel SIG* (GTIM-SIG) was founded in 1992 and aims to establish and manage a GIS at the national level. 'Public sector SDI' may be a more appropriate term for this GIS but is not used as such. This working group was installed by the government and is currently composed of 12 representatives of the ministerial departments dealing with GI. Its mission is to:

- Define the needs of GI in the public sector;
- Coordinate the public efforts;
- Propose a common solution for the whole public sector in the domain of GI;
- Promote the use of the existing public databases in the public sector and

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



- Support the main producer of data (Administration du Cadastre et de la Topographie, ACT) in the realisation of products that come as close as possible to the public sector needs.

The *Administration du Cadastre et de la Topographie* (ACT - [www.etat.lu/ACT](http://www.etat.lu/ACT)) is a government department offering services in the area of land registration, cartography, geodesy and administration, operating under the Luxembourg Ministry of Budget. The ACT undertakes all the work associated with land registration, cadastral surveys, geodesy, topography and the implementation of a national GIS. At present, ACT is hosting the only geo-portal<sup>2</sup> at the national level (<http://geoportail.lu/Portail/> and <http://map.geoportal.lu>). ACT is member of EUROGEOGRAPHICS and of EUROGI.

The Luxembourg government has launched its e-government programme “e-Lëtzebuerg” to ensure that the government and its institutions have a presence on the Internet. Under the same programme the geoportal is created. As a part of this, the ACT is developing what is called the e-cadastre project. The aim is to bring to the public official data, products and services including cadastral and cartographic products.

ACT is considered as the major node of an NSDI under construction.

ACT and the National IT administration CTIE (Centre des Technologies de l’Information de l’Etat) launched a study on the possibilities, impacts and needs of a national SDI, based upon the geoportal, which previously had been created and launched by ACT.

The main targets of the Luxembourg’s SDI are

- the optimised use of the public geodata sets at Government level
- easier access to geodata in general, better availability
- better basis for decision taking
- respect of the general standards and norms
- centralised know-how and support to all public bodies
- metadata creation, updating and management
- geodata creation, updating and management
- support in GIS and geodata project management for all the public bodies
- centralised geodata and metadata extraction and delivery

## 2 Details of ACT / GTIM-SIG

### 2.1 General information

ACT is an organization comparable to a National Mapping Agency or a Land Survey Service in other countries. It operates under the authority of the Minister of Finance. It is the major player on the GI-scene in G.D. Luxembourg and as such the major executive agency for the vision and objectives for a public sector GIS or SDI as put forward by GTIM-SIG in which ACT is represented.

Currently, the range of GI and metadata being made available via the ACT has expanded to a number of new data products. From limited cadastral data now it provides Geographical location, Transport, Land surface, and Environmental options to search upon. ACT was, together with CTIE, responsible for the concept study about the need, feasibility and impacts of a national SDI in Luxembourg. As ACT had started developing the so-called eCadastré solution, which continuously was further developed into the national geoportal ([www.geoportal.lu](http://www.geoportal.lu)). ACT also acts as a geodata provider: cadastral map, parcels, buildings, region names, topographic content in digital and analogue form, administrative boundaries, maps, orthoimagery and digital terrain models are basic geographic content created, maintained and provided by ACT. Furthermore, CTIE is involved in the entire networking infrastructure of Luxembourg's government.

The **main tasks** of the administration of the cadastre and topography (ACT) can be divided into three main parts.

- The creation, management, updating and dissemination of [land documentation](#) and [cartographic](#) officials of Luxembourg.
- Cadastral surveying in the Grand Duchy, regulated by the [law of 25 July 2002](#), establishing and regulating the profession of surveyors and surveying officials.
- Management of [national geodetic networks](#) .

The detailed responsibilities and tasks of the ACT are included in the [organic law of July 25, 2002](#).

### 2.2 Component 1: Coordination and organizational issues

In May 2007, the GTIM-SIG started the LSDI project ([http://www.sig.public.lu/actualites/2007/05/projet\\_LSDI/index.html](http://www.sig.public.lu/actualites/2007/05/projet_LSDI/index.html)). In the first stage, concepts were developed for:

- the management of spatial data for the organizations that do not have a GIS of their own;
- the facilitation of access to spatial data and the exchange of spatial data;

- the organization of the future NSDI.

The goal was to make these concepts and solutions as general as possible in order to better manage and organize the dissemination of spatial data to the administration and external uses. Mechanisms were developed for:

- discovering existing spatial data and their versions;
- defining the rights of access to different datasets;
- facilitating data sharing by enabling access via the Internet;
- visualization of spatial data for the general public. ([http://www.sig.public.lu/actualites/2007/05/projet\\_LSDI/index.html](http://www.sig.public.lu/actualites/2007/05/projet_LSDI/index.html)).

The Government of the Grand-Duchy of Luxembourg has created an interdisciplinary and inter-ministerial task force that takes care of the Luxembourgish Spatial Data Infrastructure (LSDI) / ILDG (Infrastructure Luxembourgeoise de Données Géographiques). This group is lead by the Administration of Cadastre and Topography (ACT), who is responsible for the biggest part of the geographic data available in the Grand-Duchy.

Under the program "e-Lëtzebuerg", the administration of the cadastre and topography has created a website called "[Geoportal National Grand Duchy of Luxembourg](#)". The Geoportal has the vocation to become the central platform of ministries, departments and State agencies, municipalities and public sector in general for data exchange, geospatial products and services.

The Geoportal offers the following services:

- Mapping the ATM
- metadata centralized catalogue
- the phone shop for online orders of geoproducts
- direct access to spatial data by "web services" for business customers

The CC-ILDG is an organization that acts as a steering committee of all the activities concerning the creation, updating, management and distribution of geographic data, either in analogue or in digital form. The idea behind this committee is to gather the geodata stakeholders' decision makers, in order to create a platform for a coordinated approach in all activities concerning geodata.

The committee has been created in mid 2009 and has its initial organisational shape:

It consists of a President, a Vice president (senior representatives of ACT), and various members that are representatives of their respective public organizations, appointed by their ministers or directors in charge. At the same time several Working Groups exist.

They consist of several representatives and work independently on their subject, produce the corresponding deliverables and report to the general assembly.

The actual WGs are:

- WG for the creation of an INSPIRE law text
- WG for the publication of the agricultural use reference parcels
- WG for the water data
- WG for socio-economic data
- WG for the management of metadata
- WG for the inventory of INSPIRE data

The CC-ILDG has been designed as a collaborative instance, and has been operational until now without any official system of rules. The proposed INSPIRE law text, which actually is undergoing the official legislature procedure, institutionalizes the CC-ILDG but does not give any precisions about its working principle.

### 2.2.1 Conclusions of Component 1

The Luxembourgian SDI approach is truly national. SDI building blocks have reached a significant level of operationality. The Government of the Grand-Duchy of Luxembourg has created an interdisciplinary and inter-ministerial task force that takes care of the Luxembourgish Spatial Data Infrastructure. This group is lead by the Administration of Cadastre and Topography (ACT). The CC-ILDG is an organization that acts as a steering committee of all the activities concerning the creation, updating, management and distribution of geographic data, either in analogue or in digital form. The idea behind this committee is to gather the geodata stakeholders' decision makers, in order to create a platform for a coordinated approach in all activities concerning geodata.

Based on these conclusions we score the indicators as follows:

- The approach and territorial coverage of the SDI is truly national
- One or more components of the SDI have reached a significant level of operationality (3)
- The officially recognised or de facto coordinating body of the SDI is a NDP, i.e. a NMA or a comparable organisation
- The officially recognised or de facto coordinating body for the SDI is an organisation controlled by data users (Not so clear)

- An organisation of the type ‘national GI-association’ is involved in the coordination of the SDI (No)
- Producers and users of spatial data are participating in the SDI (Not so clear)
- Only public sector actors are participating in the SDI

## **2.3 Component 2: Legal framework and funding**

### **2.3.1 Legal framework**

The legal framework for the Luxembourg SDI is very limited.

The cadastre was organised mainly by the “Loi du 21 juin 1973 portant organisation de l'Administration du Cadastre et de la Topographie” and a number of subsequent regulations (<http://www.act.public.lu/fr/legislation/index.html>). A reorganisation was put in place by the law of 25 July 2002.

The INSPIRE directive has not been fully transposed and in June 2010, the European Commission has decided to take Luxembourg to the European Court of Justice for infringement of its obligation to transpose the directive ([http://ec.europa.eu/community\\_law/eulaw/decisions/dec\\_20100603.htm](http://ec.europa.eu/community_law/eulaw/decisions/dec_20100603.htm)).

### **2.3.2 Public-private partnerships (PPPs)**

No information has been found.

### **2.3.3 Policy and legislation on access to public sector information (PSI)**

There is no general freedom of information law in Luxembourg. Under the 1960 Decree on state archives, the archives are to be open to the public, but people must make a written request explaining why they want access and ministers have broad discretion to deny requests.

Directive 2003/4 on access to environmental information was transposed by the Law of 25 November regarding public access to environmental information (Loi du 25 novembre 2005 concernant l'accès du public à l'information en matière d'environnement, <http://www.legilux.public.lu/leg/a/archives/2005/2041912/2041912.pdf?SID=143d7626b0a51f7399c30822b3562e8c#page=2>).

Directive 2003/98 on the re-use of public sector information was transposed by the Law of 4 December 2007 ([http://ec.europa.eu/information\\_society/policy/psi/docs/laws/luxembourg/lux\\_law\\_2007.pdf](http://ec.europa.eu/information_society/policy/psi/docs/laws/luxembourg/lux_law_2007.pdf)).

### **2.3.4 Legal protection of GI by intellectual property rights**

The Luxembourg Copyright Act dates from 2001 and was modified in March 2004. It protects literary and artistic works, including photographs, databases and computer programs.

Article 10 of the Copyright Law determines that official texts of the authorities, including their official translations, shall not give rise to copyright. This also includes the preliminary works, court decisions and political discussions. All other writings produced by the State, municipalities or public establishments shall give rise to copyright for a term of 70 years.

There are no special regulations regarding the protection of geographical information.

The Copyright Act transposes the 1996 directive on databases and the 2001 directive on copyright in the information society into Luxembourg law.

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

The Luxembourg Data Protection Law was adopted in 2002, in order to implement the European Data Protection Directive of 1995. In 2007, it was amended for the last time. The 2002 directive on privacy and electronic communications was transposed by the Law on "Privacy in Electronic Communications" of May 30, 2005 (Loi du 30 mai 2005 relative aux dispositions spécifiques de protection de la personne à l'égard du traitement des données à caractère personnel dans le secteur des communications électroniques).

### **2.3.6 Licensing framework**

In March 2009, two regulations were adopted that regulate the conditions for access and delivery of cadastral data and cartographic, topographic and geodetic data (*Règlement grand-ducal du 9 mars 2009 portant fixation des conditions et modalités de délivrance de la documentation cadastrale* and *Règlement grand-ducal du 9 mars 2009 portant fixation des modalités de mise à disposition et des tarifs des produits cartographiques, topographiques et géodésiques de l'administration du cadastre et de la topographie* – see <http://www.act.public.lu/fr/legislation/diffusion-donnees/index.html>).

Cadastral extracts can be delivered digitally or on paper. Any reproduction of the data should mention the source and the date of validity. Digital data have to be requested in writing and the public authorities have to state the task in the public interest for which they need the data. Other natural or legal persons do not need to state an interest; they should only make a request in writing.

For obtaining topographic, cartographic and geodetic data, an agreement has to be signed between the user and the administration fixing the details of delivery and the price. The rights of use are determined in the regulation. A distinction is made between different types of use: internal use, external use by disseminating the data to contractors, reproduction of the data.

### 2.3.7 Funding model for the SDI and pricing policy

The money used by the GTIM-SIG is allocated by the government in the ordinary annual budget and related to a specific project (approximately 50.000 EUR per year).

The ACT is funded 100% by the government; the receipts resulting from the sale of its products cannot be reinvested by ACT. Charges and prices for the data are determined by the *Règlement grand-ducal du 9 mars 2009 portant fixation des conditions et modalités de délivrance de la documentation cadastrale* and *Règlement grand-ducal du 9 mars 2009 portant fixation des modalités de mise à disposition et des tarifs des produits cartographiques, topographiques et géodésiques de l'administration du cadastre et de la topographie*.

For cadastral parcels, 0.05 € is charged per parcel. For extracts of the cadastral plans, prices are determined by the size of the surface. For cartographic, topographic and geodetic data, prices are fixed for pre-determined units or per km<sup>2</sup>. The data is available free of charge for national public authorities performing their missions, for secondary school teachers. Local authorities get a 20% discount.

### 2.3.8 Conclusions of Component 2

The INSPIRE directive has not been fully transposed. There is no general freedom of information law in Luxembourg. There are no special regulations regarding the protection of geographical information. In March 2009, two regulations were adopted that regulate the conditions for access and delivery of cadastral data and cartographic, topographic and geodetic data.

Based on these conclusions we score the indicators as follows:

- There is a legal instrument or framework determining the SDI-strategy or – development (No)
- There are true PPP's or other co-financing mechanisms between public and private sector bodies with respect to the development and operation of the SDI-related projects (No)
- There is a freedom of information (FOI) act which contains specific FOI legislation for the GI-sector (No)
- GI can specifically be protected by copyright (No)

- Privacy laws are actively being taken into account by the holders of GI (No Information found)
- There is a framework or policy for sharing GI between public institutions (In Preparation)
- There are simplified and standardised licences for personal use (No Information found)
- The long-term financial security of the SDI-initiative is secured (No)
- There is a pricing framework for trading, using and/or commercialising GI (No)

## **2.4 Component 3: Data for themes of the INSPIRE annexes**

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

ACT produces the 'Plan Cadastral Numérisé' by scanning and vectorisation of the printed cadastral plans. The complete list of the topographic maps offered is available via the geoportal at: <http://geoportail.lu/Portail/voirListeProduitsAction.do?dispatch=loadCategorie&categorie=1&fonction=voirProduits>.

The Cartographic Service within the ACT provides the topographic maps at the scale 1:20 000. These maps are created based on aerial photos, and updates are made about every ten years. The 1:20 000 maps are then used to derive different maps at the following scales: 1:50 000, 1:100 000 and 1:250 000.

### **2.4.2 Data by resolution or scale range for the INSPIRE themes**

The BD-L-TC (<http://geoportail.lu/Portail/guichetext.jsp?TIME=1277898498891>) is a vector database created at the scale 1:5 000 and derived from a photogrammetric survey. The database covers the complete extent of the country. The data are grouped in ten themes and each theme has multiple classes of objects: points, lines, areas. These objects are described by attributes. The ten themes are:

- Roads
- Railways and energy lines
- Hydrography
- Buildings and infrastructure



- Vegetation
- Orography
- Altimetry
- Administrative boundaries
- Geodetic infrastructure
- Toponymy

RGB Orthophotographs with a resolution of 0.5 meter \* 0.5 meter, derived from a flight in august 2001 are available in TIFF-format

The digital orthophotos of the Grand Duchy are managed in the database BD-ORTHO-L, covering the entire territory of the Grand Duchy of Luxembourg with a resolution of 0.5 meter \* 0.5 meter. A number of flight campaigns have been carried out in 2001, 2004 and 2007. The specifications of the orthophotos are available at: <http://www.act.public.lu/fr/cartographie/photos-aeriennes/index.html>.

Regarding the three INSPIRE annexes addressing the 34 spatial data themes, Luxembourg is providing discovery and view services for some of them while a number of them can be also downloaded. A complete list will be presented in the updated report including the information provided by the country in 2010.

### **2.4.3 Geodetic reference systems and projections**

Spatial referencing is done by co-ordinates. However, it is not specified if this is according to ISO.

Geographic co-ordinates are indicated on the topographic maps published by the ACT. These co-ordinates are referenced in agreement with ED50. This system uses the same ellipsoid as Hayford International 1924.

The geographic point of reference in Luxembourg is “Wemperhardt”, and is attached to the German system. The altitude of the reference point is 528.030 metres.

The projection system used throughout all mapping at all scales in Luxembourg (from the ACT) is Cylindrique Transversale, sometimes referred to as Gauss-Luxembourg, and is called the LUREF. The WGS84 transformation is made via the “Helmet”.

Information about LUREF and parameters for the transformation from the national system to WGS84 and EUREF 89 are available at <http://www.act.public.lu/fr/publications/documents-techniques/luref-details.pdf>.

#### **2.4.4 Quality of the data**

The ACT clearly specifies that the cadastral maps in digital form have been scanned and digitized from the original cadastre maps. Thus the accuracy of all cadastre products is limited to the accuracy of the original information.

The geoportal department of ACT has established several procedures that are able to identify major problems concerning the data and their availability.

- specialized software permanently scans the general availability of the WMS & WFS webservices, as well as their response time, and files alarm messages when certain trigger values are passed.
- at data synchronisation, several critical data are analysed manually, graphically and statistically, before the new dataset version is released into the geoportal database and the webservices.

#### **2.4.5 Interoperability**

The GIS software being used by the ACT is not specified, but seems to be ARC/INFO.

Geodatasets is made available in the following formats: ARC/Info coverage, ARC/Info Export, ESRI-Shapefiles, ARC/INFO-Ungenerate, DXF, and IGES.

TIFF is used as the format to make topographic maps and plans available in image format from ACT. The maps are put on CD-Rom and sold at unit price.

All the LSDI's webservices can be used in EPSG: 2169 (local Luxembourgish SRS) or in EPSG: 4326 (WGS84 Lat/Lon) for interoperability. The available Map Viewers are able to reproject the data or (at least) indicate the mouse coordinates in EPSG: 4326

#### **2.4.6 Language and culture**

Available metadata is provided in French – referring to what is presently available on the ACT web pages, although an English and German search option exists.

#### **2.4.7 Data Content**

NIA

#### **2.4.8 Geographical names**

Place names are available from different sources.

- The Luxembourg gazetteer of villages and towns. This is not coordinated by ACT. The names are given in French, German and Luxembourgish. The

database is managed by the Institut Grand-Ducal, Section de Linguistique, d'Ethnologie et d'Onomastique;

- Place names are also one of the themes in the BD-L-TC and are managed by the ACT.

### 2.4.9 Conclusions of Component 3

Already from the previous LU's SoP report Geodatasets existed which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components while the geodetic reference system and projection systems are standardised, documented and interconvertible. The INSPIRE 2010 MR confirms the statement. 101 data sets have been reported (45, 15 and 41 for Annex I, II and III respectively). The geoportal department of ACT has established several procedures that are able to identify major problems concerning the data and their availability. Specialized software permanently scans the general availability of the WMS & WFS web services, as well as their response time, and files alarm messages when certain trigger values are passed.

Based on these conclusions we score the indicators as follows:

- Geodatasets exist which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components
- The geodetic reference system and projection systems are standardised, documented and interconvertible
- There is a documented data quality control procedure applied at the level of the SDI (Partially)
- Concern for interoperability goes beyond conversion between different data formats (No Information found)
- The national language is the operational language of the SDI
- English is used as secondary language (No)

## 2.5 Component 4: Metadata

### 2.5.1 Availability of metadata for data

Metadata of all existing data in the geoportal are available at: <http://www.etat.lu/ACT/bd1tc1.html...>

## 2.5.2 Metadata catalogues availability + standard

The geoportal allows for metadata search on all existing databases and services. The metadata catalogue is in French, English, German, and Luxembourgian. The metadata catalogue is based on the ISO standard 19115.

(<http://geoportail.lu/Portail/menuAction.do?dispatch=load&menuToLoad=inspireSearchMetadata>)

The metadata is managed using the online metadata editor and validator of the ACT's geoportal (<http://www.geoportal.lu>).

All the datasets and services that are relevant for INSPIRE can be discovered in the geoportal's metadata catalogue, can be visualised in the geoportal map viewer, accessed / downloaded through OGC webservice (WMS, WFS) or ordered online through the geoportal's shop module.

All the metadata that is available in the catalogue (or through the geonetwork-based CSW service) are compliant with INSPIRE and have been validated using the online INSPIRE metadata validator.

The Monitoring Document for 2010 lists all the datasets and services that are defined in the metadata catalogue at the current state. All geodata that have been considered INSPIRE relevant at the current state, are available via OGC conform spatial data services. They are only directly accessible from the inside of the official governmental network, as these datasets are not free of charge or use. For this reason, Luxembourg is at the moment not able to provide direct links via the INSPIRE geoportal.

However, the corresponding metadata are discoverable via the OGC compliant (CS-W) webservice at the URL [ws.geoportal.lu/geonetwork](http://ws.geoportal.lu/geonetwork), or via the geoportal [www.geoportal.lu](http://www.geoportal.lu).

## 2.5.3 Conclusions of Component 4

Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes. The 2010 MR reveals that for the reported datasets of INSPIRE (100% of the data sets have metadata). However for Annex III the majority of datasets are not reported as existing. The geoportal allows for metadata search on all existing databases and services. The metadata catalogue is based on the ISO standard 19115. ACT and the National IT administration CTIE based on the main targets of the Luxembourg's SDI are responsible for metadata creation, updating and management. However is not clear who is doing what.

Based on these conclusions we score the indicators as follows:

- Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes (Partially)
- One or more standardised metadata catalogues are available covering more than one data producing agency
- There is a coordinating authority for metadata implementation at the level of the SDI (Not so clear)

## **2.6 Component 5: Network services**

There are two portals of the LSDI available:

- <http://www.geoportal.lu> is the general page of the geoportal informing the users about available datasets and services as well as view or order data. Specialists can obtain a login giving them access to special functions such as advanced querying / overlay capabilities of cadastral information.
- <http://map.geoportal.lu> is the web mapping platform bringing the LSDI's data to the general public. An average number of 250 distinct users are using the portal day by day, generate 4+GB of traffic a day and print an average of 200 PDFs a day.

The use of the portal is monitored by an analysis of the weblogs as well as the user data/service preferences.

The LSDI offers a lot of OGC compliant webservice (WMS, WFS, WCS, CSW).

These are oriented to 4 types of users:

- Users that are inside the Luxembourgish State Network ([wsetat.geoportal.lu](http://wsetat.geoportal.lu)/...)
- Users that have a login and a data sharing agreement with the Luxembourgish State ([wssec.geoportal.lu](http://wssec.geoportal.lu)/...)
- General Public ([ws.geoportal.lu](http://ws.geoportal.lu)/...)
- Users that want to access INSPIRE compliant and relevant data ([wsinspire.geoportal.lu](http://wsinspire.geoportal.lu)/...)

On the website of the geoportal the presentation of the various webservices is available (<http://www.geoportail.lu/Portail/menuAction.do?dispatch=load&menuToLoad=services>)  
The services are divided to:

WMS services: 48 services exist out of which 5 are protected web services, 2 are accessible for the general public and 9 are limited to Luxembourg's state network.

WFS services: 16 services exist out of which 18 are protected web services, 4 are accessible for the general public and 26 are limited to Luxembourg's state network.

and

[CSW services: 1 webservice exist to request geoportal metadata.](#)

Furthermore, in some layers of the Geoportal, users can click on an object to gain additional information. This is particularly true for the following layers:

- Plots
- Buildings
- Addresses
- Towns, Districts, Townships
- Municipalities and cadastral sections
- Watercourse
- Cross sections
- Natura2000
- Contours
- Land cover
- Watersheds

The national register of addresses (<http://www.act.public.lu/fr/parcelles-residences/registre-adresses/index.html>) is continuously updated by the ACT. The data owner is the Centre des Technologies de l'Information de l'Etat (CTIE). The database will be available to all actors in the public sector. The addresses recorded in the "National Register of localities and streets" that are not georeferenced contain the following information: name of the administration district; name of the canton; name of the commune; name of the locality; name of the road; number of the building; postal code

On-line access service for metadata: discovery services

see section 2.5.2.

### **2.6.1 On-line access service for data: download services**

Users after being register can order and download data from the geoportal. It should be mentioned that orders via the geoportal are not yet completely automatic and instantaneous.

### **2.6.2 Inter-linkages of on-line access services for metadata and data**

Not applicable.

### **2.6.3 Open Source software and access services**

Not applicable.

### **2.6.4 Availability viewing services**

A number of different viewing services exist in the general geoportal and the web mapping platform (<http://map.geoportail.lu/?lang=en>)

### **2.6.5 Availability of catalogue services to regulate access**

Not available.

### **2.6.6 Availability of catalogue services that perform payment operations**

Not available.

### **2.6.7 Availability of catalogue services to extract and send data to a user application**

No such applications were identified.

### **2.6.8 SDI user applications**

No such applications were identified.

### **2.6.9 Availability of geo-processing services**

ACT provides

- A distance calculation (software) tool on CD-Rom. The tool calculates the distance for a precise itinerary and provides the user as output a PDF map (scale of 1:100 000);

- Extraction of topographic information based on different geo-processing techniques: buffer around point or linear feature, etc. The resulting data/map is put on CD-Rom for the client;
- A pricing and ordering service. It is presently possible to access via the web the different order forms. These are to be printed out and filled in by hand.

## 2.6.10 Conclusions of Component 5

The geoportal allows for metadata search on all existing databases and services. The metadata catalogue is in French, English, German, and Luxembourgian. The MR states that there are 3 discovery services. Moreover, it states that there are 57 view services (which basically are variations of the geoportal.lu for different type of datasets. There are two portals of the LSDI available: <http://www.geoportal.lu> is the general page of the geoportal informing the users about available datasets and services as well as view or order data. <http://map.geoportal.lu> is the web mapping platform bringing the LSDI's data to the general public. Users after being register can order and download data from the geoportal. It should be mentioned that orders via the geoportal are not yet completely automatic and instantaneous. The webservice is available at: <http://www.geoportail.lu/Portail/voirListeProduitsAction.do?dispatch=loadCategorie&categorie=3&fonction=voirProduits>. Although the MR states 2 transformation services upon checking the web links no transformation is presented rather general WMS links

Based on these conclusions we score the indicators as follows:

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



## 2.7 Component 6: Thematic environmental data

An ‘environmental portal’ has been opened at <http://www.environnement.public.lu/> . It does however not identify nor provide access to environmental datasets. However on the environmental data of the geoportal the ministry of environment is responsible for the data.

The map viewer of the geoportal includes themes such as Habitats and Biotopes, Biology, Geology, Natural hazards areas, protected sites, Environmental survey, Utility and government services and themes on the Water framework directive. (<http://map.geoportail.lu/?lang=en>)

The European Environment Agency’s Topic Centre for Catalogue of Data Servers/Sources (ETC/CDS) has been supporting the development of metadata for environmental datasets in Luxembourg. The ETC/CDS provided and installed CDS metadata applications in eleven different administrations at the national level that are concerned with the environment. The aim was for Luxembourg to realize a catalogue of all data related to the environment and to support reporting to European organizations. In actuality, the CDS applications were received with some criticisms related to issues such as data security, updating processes, tracking changes. The CDS applications were not well integrated into regular, daily use. They are not available through the portal.

### 2.7.1 Conclusions of Component 6

The map viewer of the geoportal includes themes such as Habitats and Biotopes, Biology, Geology, Natural hazards areas, protected sites, Environmental survey, Utility and government services and themes on the Water framework directive. (<http://map.geoportail.lu/?lang=en>). However, key themes from Annex III are missing.

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

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

## 2.8 Standards

ACT states that one of its primary objectives is to respect of the general standards and norms. As a result metadata existing in the geoportal are following the ISO 19115 standards. Furthermore, OGC standards are followed regarding the web services.

### 2.8.1 Conclusions of Component 7

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

- The SDI-initiative is devoting significant attention to standardisation issues

## **2.9 Use and efficiency of SDI**

A number of projects have been initiated involving different sectors in the field of geodata:

- ASTA (agriculture administration) and ACT cooperate to create a special function in the geoportal mapper, which allows the farmers to view and verify the officially determined agricultural land use parcels, and which offers graphic and interactive tools to declare new or modified situations.
- AGE and ACT cooperate to publish the well-known water-GIS in the geoportal
- Many members work together to create a new public address database, and to establish a procedure to update it.
- MNHN and ACT developed a biodiversity geoportal soon to be available on [map.mnhn.lu](http://map.mnhn.lu)
- AEV and ACT currently work on a renewed polluted area data management system

Moreover, there is a project going on in the Greater Region (Luxembourg, Germany, France, and Belgium) to improve cross-border consistency of spatial data sets <http://geo.uni.lu/joomla/>. Similarly the Transnational Internet Map Information System (TIMIS) Flood is a contribution to a uniform EU policy for flood protection and is meant to become a model for other regions with transnational flood issues. TIMIS focuses on both flood hazard mapping and flood forecasting for the border region of Luxembourg, Germany and France (<http://www.timisflood.net/en/>).

### 3 Annexes

#### 3.1 List of SDI addresses / contacts for Luxembourg

Table: SDI contact list			
	Web address	Organisationa l mailing address	Over-all contact person: tel./fax/e-mail
<b>National</b>			
L' Administration de la Cadastre et Topography	<a href="http://www.act.etat.lu">http://www.act. etat.lu</a>	Bâtiment- siège: 54, avenue Gaston Diderich L- 1420 Luxembourg  Adresse postale : B.P. 1761 L-1017 Luxembourg	Name: Francis Kaell and Jeff Konnen  General email: <a href="mailto:ecadastre@act.etat.lu">ecadastre@act.etat.lu</a> Téléphone: (+352) 44 901-1 Fax: (+352) 44 901- 333
GTI-SIG	none	c/o Administratio n du Cadastre et de la Topographie 54, Ave Gaston Diderich BP 1761 L-1017 Luxembourg	Mr André Majerus, Presifent of the Working Group <a href="mailto:Andre.majerus@act.e&lt;br/&gt;tat.lu">Andre.majerus@act.e tat.lu</a> Tel: +352 44 90 12 72 Fax: +352 44 90 12 88

### 3.2 List of references for Luxembourg

Table: list of references used to compile the Country Report	
<b>Web sites:</b>	
	<a href="http://europa.eu.int/ISPO/eif/InternetPoliciesSite/PublicSector/KeyReferences.html#Luxembourg">http://europa.eu.int/ISPO/eif/InternetPoliciesSite/PublicSector/KeyReferences.html#Luxembourg</a> ; <a href="http://europa.eu.int/comm/internal_market/en/dataprot/law/impl.htm">http://europa.eu.int/comm/internal_market/en/dataprot/law/impl.htm</a>
	<a href="http://www.eurogeographics.org/AboutUs/index.htm">http://www.eurogeographics.org/AboutUs/index.htm</a>
	<a href="http://www.sogi.ch/Profiles.pdf">http://www.sogi.ch/Profiles.pdf</a>
	<a href="http://www.eurogi.org/index_1024.html">http://www.eurogi.org/index_1024.html</a>
ACT	<a href="http://www.act.public.lu/fr/index.html">http://www.act.public.lu/fr/index.html</a>
Geo- Metadaten- Informationssysteme des Bundes und des Großherzogtums Luxemburg / Geo-metadata- Information system of Luxembourg	<a href="http://www.lat-lon.de/projekte.html">http://www.lat-lon.de/projekte.html</a> <a href="http://www.lat-lon.de/projekte_en.html#geometadaten">http://www.lat-lon.de/projekte_en.html#geometadaten</a>
MISLux project - the Meta Information System for geodata of the Grand Duchy of Luxembourg.	<a href="http://katla.giub.uni-bonn.de:9673/web/index.html?theme=projects&amp;item=MISLux&amp;subitem=none">http://katla.giub.uni-bonn.de:9673/web/index.html?theme=projects&amp;item=MISLux&amp;subitem=none</a>
Luxembourg gazetteer of villages and towns	<a href="http://www.igd-leo.lu/igd-leo/onomastics/villages/villages.html">http://www.igd-leo.lu/igd-leo/onomastics/villages/villages.html</a>
INSTITUT GRAND-DUCAL - Section de Linguistique, d'Ethnologie et d'Onomastique	<a href="http://www.igd-leo.lu/igd-leo/">http://www.igd-leo.lu/igd-leo/</a>
La Grande Région Saar - Lor - Lux - Rhénanie - Palatinat – Wallonie	<a href="http://www.granderegion.net/fr/grande_region/index.html">http://www.granderegion.net/fr/grande_region/index.html</a>
<a href="#">Géoportail national du Grand-Duché de Luxembourg</a>	<a href="http://www.ecadastre.public.lu/Portail/index.jsp?lang=fr">http://www.ecadastre.public.lu/Portail/index.jsp?lang=fr</a>
	<a href="http://map.geoportail.lu/?lang=en">http://map.geoportail.lu/?lang=en</a>
<b>Publications:</b>	
	ACT web site. “La mise en place d’un système integer de gestion relative à la publicité foncière” <a href="http://www.etat.lu/ACT/pubfonc.htm">http://www.etat.lu/ACT/pubfonc.htm</a>

	Craglia, M. (2000). Geographic Information Policies in Europe: National and Regional Perspectives – Report of the EUROGI-EC Data Policy Workshop, Amersfoort, 15 November 1999.
	Clark, Mike (2002). Briefing notes to the INSPIRE DPLI Working Group, Appendix A – EU Member States (brief1.doc).
	GINIE: Geographic Information Network in Europe. Spatial data infrastructures: Country Reports FINAL D 5.3.2(b). September 2002.
	Masser, Ian (1999) “All shapes and sizes: the first generation of national spatial data infrastructures”, International Journal of Geographic Information Science, vol. 13(1), pp. 67-84
	Onrud, H., Department of Spatial Information Science and Engineering, University of Maine, Orono, Maine. GSDI - Survey of National and Regional Spatial Data Infrastructure Activities Around the Globe, Part I – National Spatial Data Infrastructure Initiatives. <a href="http://www.spatial.maine.edu/~onsrud/GSDI.htm">http://www.spatial.maine.edu/~onsrud/GSDI.htm</a>
	When de Montalvo, Uta (2001). “Strategies for SDI implementation: A survey of national experiences. Paper presented at the 5th Global Spatial Data Infrastructure Conference, 21-25 May 2001
<b>Other sources:</b>	
	Crompvoets, Joep (2002). E-mail of 08-11-2002. Subject: Notes regarding the SDI situation in Luxembourg and Finland.
	Reisch, Bernard (2002). Administration du Cadastre et de la Topographie. E-mail of 15-11-2002. Subject: Notes regarding Metadata Catalogue Service, etc. for Luxembourg.
	INSPIRE Member State Report, 2010