



Spatial Data Infrastructures in Liechtenstein: State of play Autumn 2006

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Change matrix 2006 versus 2005

Paragraphs in which information is reported which deviates in a significant way from what was reported in the Spring 2005 version of this country report are listed in the below table. **They are indicated in red.**

Paragraph	Type of change
All	Restructure and reword to bring the report more in line with INSPIRE
1.1	Modify to reflect the 2006 update
2.2	New section on coordination and organizational issues
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Executive summary

Already in 1995, the Liechtenstein government decided to build an integrated land information system (LIS/GIS-FL) covering its complete territory and containing geodatasets for multiple use by various public users. On July 14, the Liechtenstein Government renamed the LIS/GIS FL project to “Geodateninfrastruktur Liechtenstein” (GDI Liechtenstein). By the end of 2004, the legal framework concerning geoinformation is expected to be approved by parliament.

The responsible authority for the GDI Liechtenstein and for general spatial and geographic data and services is the Office for Civil Engineering (*in German: Tiefbauamt - TBA*). This office maintains an on-line geo-data portal for the country. The principle functions of the TBA cover: construction and maintenance of roads, mudflows and lakes/rivers, survey, land information.

Today, the GDI Liechtenstein is operational and can be considered as a simple, centralised but operational NSDI for a limited user base. A metadata catalogue is under preparation. A metadata and related access services are planned to be developed according to the Swiss standards.

For issues of organisation, standardisation and technical characteristics, the Liechtenstein NSDI is heavily oriented towards the Swiss model. Hence, the INTERLIS standard is pertinently used.

In 2005 several changes will start or come into place at the organisational/legal, as well as at the technical level (update GDI portal, services).

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Abbreviations and acronyms

GDI	Geodateninfrastruktur
GI	Geographical Information
INSPIRE	INfrastructure for SPatial InfoRmation in Europ
INTERLIS	Data exchange mechanism for Land Information Systems
KOGIS	Swiss Office of Topography
LIS/GIS FL	Land Information System/GIS in the Principality of Liechtenstein
NSDI	National Spatial Data Infrastructures
PPP	Public-Private Partnership
SD	Spatial Data
SDI	Spatial Data Infrastructure
TBA	Office for Civil Engineering (<i>in German: Tiefbauamt</i>)
URG	Urheberrechtsgesetz
URL	Universal Resource Locator
WMS	Web Mapping Service

1 GENERAL INFORMATION

1.1 Method

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

The report is based mainly on the analysis of a limited number of web sites and other documents readily accessible:

- <http://www.llv.li/> (Government);
- <http://www.avw.llv.li> (Statistical Office).

A few comments have been provided in written (e-mail) form by Mr Hubert Büchel, from the Ministry for National Economy and Mr Jürg Kaufmann, advisor to the government of Liechtenstein in SDI-related matters. These have been integrated already in the 2003 version of the report. The 2004 version has been elaborated based on comments received from Mr. Jehle from the Tiefbauamt in Vaduz and from a limited review of web sites. The update of 2005 is based on input from Mr. Jehle. **For the update of 2006, various sources were used to add new or updated information , mainly related to legal and organizational issues.**

1.2 Background

The Liechtenstein Government contracted 1994 a consultant (Jürg Kaufmann) to elaborate a basic concept for a coordinated geo-information management in the Principality. The resulting report recommended²:

- To build-up a common data infrastructure based on the official cadastral surveying;
- To implement a unit in the government for coordination of geo-information and acting as a consulting body for municipalities, public-private and private enterprises;
- To draft a legal framework for geo-information;
- To constitute an executive board for the implementation on an NSDI;
- To implement a consultative unit for information exchange with the stakeholders.

The evolution towards an NSDI in Liechtenstein goes along with important reforms in the Cadastre. A key document is the report “Cadastre 2014: From theory to practice” (see Kaufmann, 1998). The Cadastre 2014 report has been used to structure the new cadastral system for the Principality of Liechtenstein including new cadastral laws which

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

² Reference e-mail from Juerg Kaufmann, 21 July 2003

declare that every set of legal land objects³ are to be part of the NSDI. The new cadastre contains a broad range of information which will be shared by State and Municipal authorities, citizens and the market players. The information includes: Private property parcels; Encumbrances; Land use zones; Water/hydrology; Landscapes; Rock fall areas; Avalanche areas; Landslide and Flood risk areas; Monuments and building protection zones; Agriculture protection zones; Civil protection; Sewerage; Energy infrastructures; etc.

Other events and actions have also contributed towards providing a solid foundation to establish the NSDI, one key component being the creation of the INTERLIS⁴, a system-independent data-modeling and data exchange mechanism.

In August 2003 the official eGovernment-portal <http://www.llv.li> became operational. It provides public access to the geo-information declared to be public by law (http://www.llv.li/allgemeine_infos_home/portal_datensammlung/portal_geodaten_info.htm). Additional geo-information for official purposes is available via a protected part of the portal. It is currently revised and is expected that a new version will be available by the middle of 2005. It will contain some additional information about the GDI Liechtenstein.

1.3 Overview of selected SDI-initiatives

One single NSDI-initiative has been detected and is described in more detail in Chapter 2, i.e. the GDI Liechtenstein, which is becoming operational for the full territory of the Principality.

³ A land object is a piece of land in which homogeneous conditions exist within its outlines. The legal land objects are described by the legal content of a right or restriction and the boundaries which demarcate where the right or restriction applies. (see definition as provided in the report [Cadastre 2014](#)).

⁴ INTERLIS was created in the mid 1980's and has been most recently elaborated to include adequate geo-data descriptions.

2 Details of the NSDI(FL) and GIS/LIS FL

2.1 General information

The government adopted the proposals for coordinated geo-information management by Kauffman (see Section 1.2) in Spring 1995. Since 1995 a continuous development of the NSDI in the framework of a project called LIS/GIS-FL (since 2004 called GDI Liechtenstein) is going on.

One of the results is that all efforts for data acquisition are now coordinated (e-mail from Jürg Kaufmann, 21 July 2003).

The competent authority in Liechtenstein for spatial and geographic data and services, including the GDI Liechtenstein, is the Office for Civil Engineering (*in German: Tiefbauamt - TBA*). This office maintains an on-line geo-data portal for the country. The principle functions of the TBA cover: construction and maintenance of roads, mudflows and lakes/rivers, survey, land information.

For access and more information on the geo-data portal the contact persons are:

Mr Heinz Ritter, Heinz.Ritter@tba.llv.li

Mr Herbert Marxer, Herbert.Marxer@tba.llv.li tel.: +423 236 68 51

2.2 Component 1: Coordination and organizational issues

The coordination of the NSDI lies with the *Tiefbauamt* and the *Amt für Personal und Organisation der Liechtensteinischen Landesverwaltung*.

Liechtenstein is cooperating very closely with Switzerland. One can even say that the SDI-strategy used in Switzerland will also be adopted in Liechtenstein. Liechtenstein is autonomous in the domain of GIS-activities, but for this subject matter Liechtenstein usually adopts the Swiss norms.

2.3 Component 2: Legal framework and funding

2.3.1 Legal framework and organizational issues

A legal framework taking into consideration the geo-information was treated in the Liechtenstein parliament in autumn 2004. This resulted in the law of 19 May 2005 on the Cadastre (Gesetz vom 19. Mai 2005 über die Amtliche Vermessung (Vermessungsgesetz; VermG - <http://www.gesetze.li/Seite2.jsp?LGBIm=2005148>) and the Ordinances of 12 July on the Cadastre and on the charges for obtaining data from the SDI of Liechtenstein (Verordnung vom 12. Juli 2005 über die Gebühren für den Bezug von Daten aus der Geodateninfrastruktur Liechtenstein).

The law of 19 May 2005 states that the cadastral data are the basic layer for the building and functioning of the spatial data infrastructure of the entire country, which will be available for public and private purposes.

2.3.2 Public-private partnerships (PPP's)

Contracts between the government and the municipalities and companies about common utilization of GI have been elaborated (e-mail Kaufmann, 21 July 2003).

In Liechtenstein, the private sector is especially involved in the development of geographical data and products. Data is almost exclusively created for the public administration.

2.3.3 Policy and legislation on access to public sector information

Access to public sector information in general is guaranteed by Law no. 172.015 (Gesetz vom 19. Mai 1999 über die Information der Bevölkerung (Informationsgesetz) . **Liechtenstein has not yet implemented Directive 2003/98/EC, but the preparations for doing so are underway:**

(http://europa.eu.int/information_society/policy/psi/actions_ms/implementation/index_en.htm#Liechtenstein). Law no.814.02 on environmental information (Gesetz vom 22. Oktober 1992 über Umweltinformationen) provides access for every citizen to environmental information.

Currently there is no metadata catalogue for Liechtenstein. The development of such a metadata catalogue is however planned, in cooperation with Switzerland.

2.3.4 Legal protection of GI by intellectual property rights

The Act no. 231.1 of 19 May 1999 on Copyright (Gesetz vom 19. Mai 1999 über das Urheberrecht und verwandte Schutzrechte (Urheberrechtsgesetz, URG) protects works of literature and art. It explicitly protects photographic works and maps. It replaced the Act of 1928 on Copyright. **The 2001/29/EC directive on the harmonisation of certain aspects of copyright and related rights in the information society has not yet been implemented** (<http://web.eftasurv.int/search.aspx?ecRef=2001%2f29>).

There are no special regulations on legal protection of GI in Liechtenstein. All data of the NSDI are captured and maintained according to a private or public law (e-mail Kaufmann, 21 July 2003)..

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

In Liechtenstein the law on data protection (235.1) dates from March 14, 2002 and the respective ordinance (235.11) from July 7, 2002 (see www.gesetze.li). The regulations are based on EU-guidelines (e-mail Kaufmann, 21 July 2003).

2.3.6 Licensing framework

In Liechtenstein, all public authorities use the same licensing policy.

2.3.7 Funding model for SDI and pricing policy

Funding

The state of Liechtenstein bears the largest part of the financing of the NSDI. The municipalities and utilities companies also bear part of the costs, i.e. the cost for their

own specific databases. The financing of the cadastre is arranged in the law of 19 May 2005 on the Cadastre. The largest part of the costs is carried by the national funds.

Pricing

The pricing policy from 1997 (Verordnung vom 25. Februar 1997 über die Einhebung von Gebühren für die Benützung des Landinformationssystems und Geographischen Informationssystemen (LIS/GIS), no. 214.311.3), which applied to all GI of NSDI, was replaced by the pricing policy from 12 July 2005 (Verordnung vom 12. Juli 2005 über die Gebühren für den Bezug von Daten aus der Geodateninfrastruktur Liechtenstein).

2.4 Component 3: Data for themes of the INSPIRE annexes

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

2.4.2 Data by resolution or scale range for the INSPIRE themes

Since 1995 Liechtenstein has had a nation wide LIS/GIS set up (referred to as the GDI Liechtenstein). The data available include the following topics:

- The official cadastre survey (and all the data it contains or will contain: private property parcels; encumbrances; land use zones; water/hydrology; landscapes; rock fall areas; avalanche areas; landslide and flood risk areas; monuments and building protection zones; agriculture protection zones; civil protection; sewerage; energy infrastructures; etc.)
- Regional development planning;
- Environmental protection;
- Water pollution (prevention);
- Disaster (prevention);
- Agriculture;
- Civil defense.

There are about 80 information layers in the GDI Liechtenstein of which 60 are the responsibility of the state and 20 the responsibility of municipalities and utility companies. The cadastre survey provides the geo-reference (data model) for all the data in the GDI Liechtenstein and all the datasets are defined following the INTERLIS standard.

2.4.3 Geodetic reference systems and projections

Liechtenstein uses currently the same reference and projection systems as Switzerland (e-mail Kaufmann, 21 July 2003).

In collaboration with Switzerland, the GDI Liechtenstein is preparing the basics for a new reference system called LV95 which is designed to replace the reference system LV03 for the cadastral surveying.

2.4.4 Quality of the data

The quality checking routines are based on the Swiss standards.

2.4.5 Interoperability

The INTERLIS is a system-independent model driven approach for data exchange used in Switzerland and in the Principality of Liechtenstein.

INTERLIS provides for data transfer without information loss or requiring computer based checking and validation, while maintaining coherence, graphics descriptions, incremental updates, etc. In 1999 INTERLIS 2.0 was released. This version was specific for GI data description.

Interchange formats for Raster is TIFF. The GDI Liechtenstein is currently looking into the possibilities for developing a WMS for reference data.

2.4.6 Language and culture

The INTERLIS documentation is available in English, French, German, Italian.

2.5 Component 4: Metadata

Liechtenstein is using Geo-Shop for data distribution and intends to provide metadata according to the Swiss approach (e-mail Kaufmann, 21 July 2003).

In 2005, the GDI Liechtenstein plans to build a metadata catalogue in collaboration with the Swiss Office of Topography (KOGIS).

2.6 Component 5: Network Services

The intention is expressed to develop access services according to the Swiss standards and in cooperation with the Swiss NSDI.

Visualisation and query of parcel and address data is possible on <http://geodaten.llv.li/geoshop/public.html>. Users can also visualize risk area data: <http://geodaten.llv.li/geoshop/naturgefahren/naturgefahren.html>.

The GDI Liechtenstein is currently looking into the possibilities for developing a WMS for reference data.

2.7 Component 6: Thematic environmental data

The GDI Liechtenstein is also designed to contain thematic environmental data. See section 2.3.2.

3 Annexes

3.1 List of SDI addresses / contacts for Liechtenstein

Table: SDI contact list			
SDI Name (full)	Web address	Organisational mailing address	Over-all contact person: tel./fax/e-mail
National			
GDI Liechtenstein Coordination	www.llv.li	Coordination Spatial information c/o Tiefbauamt FL-9490 Vaduz	Peter Jehle Peter.Jehle@tba.llv.li Tel. +423 236 68 55
GDI Liechtenstein Consulting	homepage.hisped.ch/jkcons	Kaufmann Consulting Im Hauffeld 109 CH-8455 Rüdlingen	Jürg Kaufmann jkcons@swissonline.ch Tel. +41 1 867 14 36

3.2 List of references for Liechtenstein

Publications:	
	Clark, Mike (2002). Briefing notes to the INSPIRE DPLI Working Group, Appendix A – EU Member States (brief1.doc).
	Craglia, M. (2000). Geographic Information Policies in Europe: National and Regional Perspectives – Report of the EUROGI-EC Data Policy Workshop, Amersfoort, 15 November 1999.
	Kaufmann, Jürg (1998). Cadastre 2014 – A vision for a future cadastral system. Report prepared for the International Federation of Surveyors (FIG), Commission 7 – Cadastre and land Management, Working Group 7.1 - Creating Land Administration in formal and informal environments. http://www.swisstopo.ch/fig-wg71/cad2014/cad2014/index.htm
	Kaufmann, Jürg and Joseph Dorfschmid (2001). “Reflections on the benefits and potential economy of geographic data standards”, Report #17e, February 2001.

	Masser, Ian (1999). "All shapes and sizes: the first generation of national spatialdata infrastructures", in the International Journal of Geographic Information Science, vol. 13(1), pp. 67-84
	Onsrud, 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. http://www.spatial.maine.edu/~onsrud/GSDI.htm
	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