Spatial Data Infrastructures in the Slovak Republic: State of play Autumn 2006

Country report on SDI elaborated in the context of a study commissioned by the EC (EUROSTAT) in the framework of the INSPIRE initiative

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Executive summary

In the Slovak Republic, the Geodesy, Cartography and Cadastre Authority of the Slovak Republic has a mandate to work towards an NSDI for reference and core thematic data. Important efforts are going on to establish a modern cadastre which is to become part of the NSDI. The establishment of a mutual cooperation among the Geodesy, Cartography and Cadastre Authority and the Ministry of Defence represented by Topographic institute, is playing an important role. The Ministry of the Environment has a mandate to represent Slovak republic via INSPIRE expert group. Legally mandated organisations working under the Ministry of the Environment play an important role within the area of environmental thematic data. Production, handling and distribution of other datasets are in the process of being converted to digital environments. A geo-portal exists as a pilot project and a Cadastral Portal is running as well. Nevertheless there is a need to constantly improve the Internet presence. Rapid progress is being made in developing the legal framework in which an NSDI can flourish.

Over the last year, the sector of GCCA made reference pillars of the NSDI: set up the operation of the GeoPortal (www.geoportal.sk) with the overview of the maps and geographic information, set up the operation of the Cadastral Portal (www.katasterportal.sk), which allows providing information about real estate cadastre via Internet.

Stakeholder involvement seems to be weakly developed although other public sector organizations produce and manage important geo-data. We can recognise some new initiatives supporting the establishment of the NSDI both from public and from private sector.

The private sector is offering some geo-services across the internet, mainly with respect to address finding.

The environmental administrations are working in line with NSDI-principles. The most visible element is a metadata service based on the Catalogue of Data Sources model as well as providing environmental data via map services.

The strongest points of the Slovakian SDI, is the availability of a lot of data with the corresponding metadata. Catalogue services makes it possible to find the data, while several viewing services allow the users to view them. The weakest points remain the lack of clear coordinating mechanism, and the development of know-how and processes.
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<td>AIS-GCC</td>
<td>Automated Information System of Geodesy, Cartography and Cadastre</td>
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<td>CDS</td>
<td>Catalogue of Data Sources</td>
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<td>CLC</td>
<td>Corine Land Cover</td>
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<td>CSD</td>
<td>Central Space Database</td>
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<td>CT</td>
<td>Core Thematic Data</td>
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<td>ESDI</td>
<td>European Spatial Data Infrastructure</td>
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<td>ETRS</td>
<td>European Terrestrial Reference System</td>
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<td>GCCA</td>
<td>Geodesy, Cartography and Cadastre Authority of the Slovak Republic</td>
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<td>Geodetic and Cartographic Institute Bratislava</td>
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<td>GI</td>
<td>Geographical Information</td>
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<td>Geographical Information System</td>
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<td>GPS</td>
<td>Global Positioning System</td>
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<td>INSPIRE</td>
<td>INfrastructure for SPatial InfoRmation in Europe</td>
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<td>ISS</td>
<td>Local Government Information System</td>
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<td>LASR</td>
<td>Landscape Atlas of Slovak Republic</td>
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<td>LPIS</td>
<td>Land Parcel Identification System</td>
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<td>MoE</td>
<td>Ministry of the Environment</td>
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<td>NGII</td>
<td>National Geographic Information Infrastructure</td>
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<td>NMA</td>
<td>National Mapping Agencies</td>
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<td>NSDI</td>
<td>National Spatial Data Infrastructures</td>
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<td>NSI</td>
<td>National Statistical Institute</td>
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<td>PD-GIS</td>
<td>Primary Database for the Geographic Information System</td>
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<td>PSI</td>
<td>Policy and legislation on access to public sector information</td>
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<td>PPP</td>
<td>Public-private partnerships</td>
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<td>REF</td>
<td>Reference data</td>
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<td>ROEP</td>
<td>Land Title Consolidation</td>
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<td>SABE</td>
<td>Seamless Administrative Boundaries of Europe</td>
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<td>SAGI</td>
<td>Slovak Association for Geoinformatics</td>
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<td>SDI</td>
<td>Spatial Data Infrastructures</td>
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<td>Slovak Environmental Agency</td>
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<td>SR</td>
<td>Slovak Republic</td>
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<td>SSCRI</td>
<td>Soil Science and Conservation Research Institute</td>
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<td>TIBB</td>
<td>Topographic Institute in Banska Bystrica</td>
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<td>TIS</td>
<td>Territorial Information System</td>
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<td>UELN</td>
<td>United European Levelling Network</td>
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<td>Acronym</td>
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<tr>
<td>URL</td>
<td>Universal Resource Locator</td>
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<td>WGGIS</td>
<td>Working group for GIS</td>
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1 GENERAL INFORMATION

1.1 Method

This report is summarizing the state of play of SDI in the Slovak Republic, and reflects the degree to which the SDI situation is similar to the ideas set out in the INSPIRE position papers\(^1\) and in the more recent INSPIRE scoping papers.

The report is based mainly on the analysis of web sites readily accessible and on documents presented during several workshops and conferences. Completing and correcting remarks have been provided by the Geodesy, Cartography and Cadastre Authority of the Slovak Republic (versions 2003, 2004 and 2005) and the Slovak Environmental Agency (version 2003, 2004, 2005). The version of 2005 has been compiled with the active support from the Slovak Authorities. The update for 2006 was based on information obtained from presentations at the workshop “Preparing the National INSPIRE Information Days” (organized by JRC for the new and candidate Member States).

1.2 The SDI-scene in the Slovak Republic

1.2.1 Background

At this time there are a number of large-scale, multi-interest GIS projects operational in Slovakia that are important building blocks for a true SDI. Although GIS and GI are widely used terms among the Slovak organizations, the term SDI does not appear to be commonly used. Some initiatives have a few SDI-like characteristics and to the extent possible or useful these organizations are referred to in this report as potential building blocks of an NSDI (e.g. the Geodesy, Cartography and Cadastre Authority of the Slovak Republic – through Geodetic and Cartographic Institute Bratislava, the Ministry of Agriculture, the Ministry of Defence through Geoportal GCCA SR, the Ministry of education, the Ministry of agriculture, the MoE – through Slovak Environmental Agency, the SAGI).

Awareness of the need for an NSDI is growing. The main promoter is the GCCA SR. It leads the Working group for GIS (WGGIS) in the state administration which is a committee of the Government council for informatics. At present it deals with the Object catalogue of PDGIS. An important role within INSPIRE is played by the Inter-ministerial co-ordination Group of the Ministry of the Environment of the Slovak republic with cooperation of GAAC representative. The Ministry of Environment is also playing an important role in the institutional process.

The central body of the state administration of the Slovak Republic responsible for the informatics is the Ministry of Transport, Posts and Telecommunications where a function of the mandatory of informatics was establish in 2004. Within the framework of the

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\(^1\) INSPIRE position papers, final versions: RDM, ETC, DPLI, ASF, IST, IAS (latest version).
eEurope+ initiative, the Ministry has developed two dossiers, which have been approved by the government in January 2004. The first one, the Strategy of the Slovak Information Society, defines the preferred areas and the strategic goals of the informatics in the Slovak Republic. The second one, the Action Plan, contains related tasks and projects of which the results are expected for 2005.

The Government of the Slovak Republic has developed and approved a dossier within the framework of the Lisbon Strategy in February 2005 in which the development of information technologies is highlighted.

### 1.2.2 The GCCA

NSDI-related tasks and projects have been entrusted to the Geodesy, Cartography and Cadastre Authority of the Slovak Republic (GCCA) which is the central body of the state administration of the Slovak Republic responsible for Geodesy, Cartography and the Real Estate Cadastre (http://www.geodesy.gov.sk). The GCCA has established and directly controls the Geodetic and Cartographic Institute in Bratislava (GCI), the Cadastral Institute in Žilina and the Research Institute of Geodesy and Cartography in Bratislava. All these institutes have a nationwide area of competence. The specific tasks comprise:

- The technological securing of the development of the cadastre and providing the cadastral data via Internet in the framework of the Automated Information System of the Geodesy, Cartography and Cadastre (AIS-GCC);
- The legislative and technical assumptions for the creation of the Primary Data Base for the Geographic Information System (PD GIS);
- The creation of the 3-D digital terrain model as a localization base for GIS in the public administration in agreement with the standards and principles of the European Spatial Data Infrastructure (ESDI);
- To work out and issue the standards of the geo-referenced base for the National Spatial Data Infrastructure (NSDI) as well as for the objects catalogue of the GIS.

The PD-GIS will serve by 2010 as a base for the various thematic GIS and thus will be a part of the National Spatial Data Infrastructure.

The AIS GCC comprises many of the key elements of the SDI such as the geodetic control, the real estate cadastre, the PD-GIS, the standardization of geographical names and the maps of the administrative boundaries of the Slovak Republic.

Through the GCI, GCCA operates a geo-portal. For a variety of reasons however, the participation by authorities, organizations and associations to this portal is currently limited. Search functionality is limited, links to the other important geo–portals are missing, the English version is incomplete and the information content is incomplete and outdated. The Geodetic and Cartographic Institute of the GCCA is responsible for
upgrade of the geo-portal (http://www.geoportal.sk). Currently it works on the Internet as a pilot project. The Internet version contains metadata. The e-commerce services are not incorporated yet.

Through the GCI, GCCA operates a Cadastral Portal (www.katasterportal.sk). Geo-portal and Cadastral Portal are operating separately. The English version is missing. The publishing of the cadastral data through the Cadastral Portal is carried out technically by a private company. The Internet version contains data about 13 million plots of ground from all over Slovakia, but the information content is incomplete in part of geodetical information files (vector cadastral maps). The e-commerce services are being incorporated.

In the Slovak Republic, the educational aspects regarding GI (and we can assume SDI) are felt to be important. Additionally, Slovak universities are very active in GI-research and education and several national seminars are organised regarding GI-technology and applications every year by the scientific associations. An example is the SAGI seminar on the topic of NGII and metadata systems.

1.2.3 Other actors

Despite the apparently dominating role of the GCCA in the preparation of an NSDI, other actors are clearly present on the GI-/SDI-scene and are potential participants in the future GCCA-lead NSDI.

The Slovak Environmental Agency (SEA) has been established within the Ministry of the Environment. The SEA covers the national territory and focuses environmental protection, development of environmental and sustainable development policy. Important activities from the view of the SDI include:

- Co-ordination of individual partial monitoring systems;
- Establishment of SDI within the environmental sector as an part of NSDI in SR;
- Creation of the Information System of SEA as a subsystem of the Integrated Environmental Information and Monitoring System of the SR;
- Development of methodologies for individual layers of the geographic information system within the framework of SEA’s information system;
- Maintenance of the register of basic settlement units;
- Creation of the Territorial Information System (TIS) in co-operation with other legally mandated organizations in the SR;
- Professional supervision and co-ordination of the Integrated Environmental Monitoring and Information System of the SR in national as well as international context;
Co-operation with the state administration bodies and professional organizations;

Administration of Slovak Environmental CDS (Catalogue of Data Sources) – metadata service providing information about data sources which exist for the Slovak environmental sector;

Development and administration of SEA map server;

The project Corine Land Cover (CLC).

The environmental & SDI related information, including the Catalogue of Data Sources can be accessed in English via the Internet


**The Ministry of Agriculture** manages a wide range of GIS-activities. The Soil Science and Conservation Research Institute (SSCRI) operates a geo-portal. It deals with:

- Soil Geographical Information System;
- Remote Sensing Soil Survey and Control;
- Soil Monitoring;
- Accredited Soil Analysis Performances.

The SSCRI is responsible for projects with EU-dimension like the LPIS - the Land Parcel Identification System and the control of area-based subsidies with Remote Sensing.


The Forest Management Institute also operates under the Ministry of Agriculture. It is responsible for the forestry section of the State’s Information System.

[http://www.lesoprojekt.sk/english/default.htm](http://www.lesoprojekt.sk/english/default.htm)

Within the **Ministry of Defence**, the Topographic Institute in Banska Bystrica (TIBB) is responsible for designing, establishing and managing of the Land Military Information System. Its basic component is the Central Space Database (CSD) in the scale of 1:25,000 which currently covers 12% of the territory of the Slovak Republic. No access to the data is possible via the Internet. There is a close cooperation between TIBB and GCI in building CSD and PDGIS.

SDI activities specific to the **local and regional levels** are limited. Only a few municipalities and cities have a presence on the Internet, but they are not present in the current SDI framework.

Pilot project of GIS portal for Local Government:

http://www.gisportal.corageo.sk/portal_iss - it necessary to register

Local Government Information System (ISS) is a comprehensive software designed for municipal and local offices and offices of self-governing regions. The product covers all office agendas. Its uniqueness arises out of the employment of a single database which prevents multiple insertions of identical data. ISS solves the transfer of competencies within an office and enables maximum data employment and visualization by means of geographic applications. Portal solutions ensure data presentation and publication by means of state-of-the-art web technologies. ISS supports activities and employees to ensure more effective, faster and better office operation. This results in financial funds savings.

http://www.mesto.sk/projekt/mesto_eng.doc

The **Slovak Association for Geoinformatics** (SAGI) could serve as an example of a non-governmental organisation whose mission is to support the use and the development of the geographic information including GIS in the Slovak Republic. [www.sagi.sk](http://www.sagi.sk)


### 1.2.4 Major GI-projects

Slovak Republic through the GCCA participates in many projects of EuroGeographics, for example Seamless Administrative Boundaries of Europe (SABE), *EuroGlobalMap*, *EuroRegionalMap*, Europe EuroMapFinder / Metadata, *Information and Service System for European Coordinate Reference Systems and Pan-European Road Data Solution - EuroRoadS*.

**GIS of the Tatra National Park**, which includes the Study of the Actual and Potential Structure of Forest Stands in Tristarska Valley. Following layers were digitised from forest stands and forest types maps (scale 1: 10 000): forest stands, road network, hydrology, contours (20 m interval), forest types. Forest stands and forest types layers were linked to database describing actual and potential (natural, optimal) forest structure. Digital terrain model and 3D view were created.

**GIS Database of Bielovodská dolina** - The GIS database is created to support the scientific objectives of the project "Integrated risk assessment and new pest management technology in ecosystems affected by forest decline and bark beetle outbreaks". The project is a part of EU INCO-Copernicus program. Coordinator of the project is F.
Schlyter. The database is maintained by the Research Station of the Tatra National Park. A Digital Terrain Model and other GIS layers of information are now completed.

http://www.infoprojekt.sk/infoprojekt_en/index.htm

**Digital technical map of Prešov** – is an example of the Land Information Systems data gathering in the Slovak Republic. The administration of digital technical map covers 18 sq. km. The digital technical map serves as graphic database for land-orientated information systems and is continuously updated and distributed in both analogue and digital forms.

http://www.pce.sk/uk/index.htm

Since the Geo-portal managed by the Geodesy, Cartography and Cadastre Authority of the Slovak Republic is the most visible element, the future NSDI in the Slovak Republic is described in Chapter 2 from the perspective of GCCA.
2 Details of the Slovak initiative

2.1 General information

The Geodesy, Cartography and Cadastre Authority (http://www.geodesy.gov.sk) is a central body of the state administration which provides for the building and updating of the Automated Information System of Geodesy, Cartography and Cadastre, which forms a part of the State Information System. It is also responsible for creating and editing the state map series for civil needs. As a central body it methodically manages the cadastral departments of regional authorities, and the cadastral departments of district authorities. It is responsible for creating a general database for a geographic information system.

The GCCA is implementing the national initiative for developing the National Spatial Data Infrastructure. In this respect, the GCCA promotes the shared use of the geo-information such as the relief, land use, land ownership, GI about traffic, municipal infrastructure networks and for the state of the environment.

The GCCA functions actively on international forums in co-operation with other European National Mapping Agencies (NMAs) in both mapping and real estate activities. The GCCA participates in the international work in mapping through EuroGeographics. The GCCA is also a member of the Working Party on Land Administration dealing with real estate systems which functions under the United Nations Economic Commission for Europe.

Work on a new cadastral system is fundamental for GCCA. Since 1993, a new type of the real estate cadastre is being built in a distributed way. The information system of the real estate cadastre at district level is administered by district cadastral registries and on central level by the Geodetic and Cartographic Institute Bratislava. The central database of the information system of the real estate cadastre is interlinked with district databases by the transmission network. The interlinking aims at the updating of the central database of the real estate cadastre information system in a one-week (gradually a one-day interval), the securing (backup) of district databases, the securing of unity, the data quality improvement using check runs, providing, accessing and publishing information on the Internet. Since February 2004 the Cadastral Portal is available on the Internet for authorised access holders. It contains the whole documentary information on the real estate cadastre and about 30% of graphic information. From July 2004 on the private network which links the central database with 98 regional workplaces has operated.

2.2 Component 1: Coordination and organisational issues

In the year 2000, the Working Group for GIS in the Public Sector (WG GIS) was established in the framework of the Informatics Council of the Government SR. The Working Group for GIS takes over the coordination of the NSDI development. It consists of the representatives of the GCCA and its subordinate bodies as well as the
representatives of the Ministry of Defense, the Ministry of the Environment, the Ministry of Agriculture, the Ministry of Interior, the Ministry of Transport, Posts and Telecommunications, the Ministry of Defence, the Statistical Office and others. It is a high-level co-operation between ministry departments and national institutions.

All the members belong to the key stakeholders in the area of GI. The WG GIS has a number of tasks: to analyze a wide range of existing thematic GIS-es, to act as official advisory board in GI related affairs, to promote wider use of GI and identify unnecessary overlapping activities, to foster the preparation of the proposals for the standards of the PD GIS. The WG GIS thus has a mandate to give recommendations and elaborate strategies concerning the implementation of the SDI, but not to make decisions that directly bind single stakeholders. The WG GIS proposals are submitted to the Informatics Council of the Slovak Government for approval.

There is no special budget foreseen for the coordination efforts of this body because its only mandate is to give recommendations and to make proposals.

The co-ordination of the SDI at the national level has several actors involved:

- the Informatics Council of the Government SR
- the Slovak Institute for Standardization which deals with GIS and SDI related technical standards
- the Geodesy, Cartography and Cadastre Authority of the SR
- the Ministry of the Environment SR
- the Ministry of Agriculture, coordinating the development of the Land Parcel Information System for IACS
- the Ministry of Defence

A lot of attention has been paid to creation of SDI awareness amongst the (potential) users. An impact analysis is under way (EU Phare project). Even if there is progress, lack of coordination is still one of the major barriers, more specifically, the absence of a coordination authority accepted by all the stakeholders.

### 2.3 Component 2: Legal framework and funding

#### 2.3.1 Legal framework

There is not one clear NSDI roadmap strategy in Slovakia.

The legal framework on GI in Slovakia is determined by following laws and decrees:

1. The Act No. 162/1995 on the Real Estate Cadastre and the Entries of Ownership and Other Rights to the Real Estates (The Cadastre Act) as


3. The Act No. 180/1995 on Some Measures Pertaining to the Settlement of Title to the Land as amended

4. The Act No. 182/1993 on the Transfer of Ownership to Flats as amended

5. The Act No. 64/1997 on Using of the Land in Garden Colonies and on the Settlement of the Ownership to them as amended


7. Decree of GCCA No. 157/1996 by which the Act No. 180/1995 on Some Measures Pertaining to the Settlement of Title to the Land is executed

8. Decree of GCCA No. 534/2001 regulating the Details of Work Organizing and on Depositing and Manipulation of Files on Cadastral Offices and District Cadastral Registries (Administration Rule)

9. Decree of GCCA 178/1996 by which the Act of the National Council of the Slovak Republic on Geodesy and Cartography is executed

10. The Act No. 216/1995 on the Chamber of Surveyors and Cartographers


12. The Act No. 205/2004 on collecting and disseminating environmental information and on amendment and supplementation of certain acts.

Updates in the structure of the coordination system were based on new legislation planned for 2003, particularly in the amendment to the National Council of the Slovak Republic (hereinafter referred to as “NC SR”) Act No. 215/1995 on Geodesy and Cartography. The NC SR admits the amendment under the number 423/2003. By this Act an institutional framework that brings together the government, the government institutions and the local administrations, starts to be developed.

In the Act No. 215/1995 on Geodesy and Cartography, as amended by the Act No. 423/2003, the Primary Database for Geographic Information System is considered to be the core geo-referenced data set for building the State Information System by the public authorities. In this legislation the following issues are dealt with: maintenance, liability,
funding and the obligations imposed on users and producers. The category of the core data sets is rather static and no fundamental changes are being planned.


From the 1st August 2006, Enactment of the Ministry of Transport, Posts and Telecommunications SR from the 14th July 2006 No. 1706/M-2006 on Standards for the Information Systems of Public Administration is in force. From the 8th August 2005 the Committee for standardization of the information systems of Public administration is established. It is an advisory and consulting body of the Ministry of Transport, Post and Telecommunication SR in the field of introduction of the information system standards of the public administration.

2.3.2 Public-private partnerships (PPP's)

PPP’s are quite common practice in the Slovak Republic, especially in the sectors of building industry, architecture and others. In the GI-sector the PPP’s are considered to be very useful in the development of an SDI.

The public sector is mainly responsible for data collection while the private sector takes care of the value added products; information services and serves as the data reseller on the market as well. For example the publishing of the real estate cadastre data on the Internet is ensured by a private company, although all the data are collected by the public sector.

The national mapping agency has been cutting down on its value added production over the last few years. It is possible for many public bodies to enter the markets with their products and services, but in many cases it is not profitable, because the costs and expenditure of the production are often much higher than in the private sector. The co-financing between public and private sector bodies with respect to the development and operation of the SDI is possible, basically by a written contract between the public and the private organization. The share of funding from the private sector is mostly in the amount of work done (e.g. the share of private company in the creation of the product SVM 50 comprises approximately twenty percent of the whole costs).

In the Slovak Republic PPP is applied mainly in the next areas:

- all geodetic surveys for a creation of survey sketches for the GCCA purposes,
- Land Title Consolidation (ROEP) for the GCCA purposes,
- Land Consolidation Project for the GCCA purposes and realization of the Land Consolidation for the purposes of the Ministry of Agriculture SR,
- aerial photos for the purposes of the Ministry of Agriculture SR – system IACS

A non-governmental non-profit organization Public Private Partnership (http//www.ppp.sk) was founded in 2201, and creates PPP’s promoting concrete projects aiming at the development of the information society. Cooperation is planned with the Slovak Association for Geoinformatics (SAGI) focused on the support of GIS implementation in local government.
2.3.3 Policy and legislation on access to public sector information (PSI)

The right of access to PSI is implemented by the NC SR Act No. 211/2000 on the Free Access to Information of 2000. It sets broad rules on disclosure of information held by the public organisations. However, discussion keeps going on and it has not yet come into full effect. This freedom of information legislation relates to the GI sector in general but it does not relate to the GI datasets and to the data from the Cadastre of the Real Estates, which cannot be obtained on the basis of the Free Access to Information law.

The National Metadata Service for Geographic Information, the so-called Geo-portal is in the public domain and freely available to all users and data producers through the Internet as a pilot project. The task of operating the Geo-portal is fulfilled by the Geodetic and Cartographic Institute.

Directive 2003/4 on access to environmental information and Directive 2003/98 on re-use of PSI have been transposed into Slovakian law.

2.3.4 Legal protection of GI by intellectual property rights

Currently the Slovak Copyright Act is fully in line with the EU legislation. The Slovak Copyright Act (the NC SR Act No. 618/2003) based on the European Commission Database Directive 96/9/EC and Directive 2001/29/EC on copyright in the information society was implemented into Slovak legislation. Works of cartography in analogue or any other form are explicitly protected.

The strategy for the SDI does not contain specific copyright provisions. The Act on the Slovak Copyright, the Act on the Budgetary Regulation, the Act on the State Information System, the Act on the Administrative Charges are applied in this case.

Most of the GI is accessible on the basis of the written contract. In the case of the foreseen information supply via the Internet the click-use license is considered to be agreement.

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

Since the year 1998 the legal protection of privacy has been enacted in the SR legal framework (the NC SR Act No. 52/1998). The Act on the Protection of Personal Data was approved in July 2002 (the NC SR Act No. 428/2002). It limits the conditions of the collection, disclosure and use of the personal information by government agencies and private enterprises either in electronic or analogue form. It specifies the duties of access, the accuracy and the correction, security, and confidentiality on the data processor. The Act also created an Office for Personal Data Protection to supervise and enforce the Act.

The legal protection of privacy is incorporated into the Act on the Real Estate Cadastre and Entries for Ownership and Other Rights to the Real Estates and in the Act on Geodesy and Cartography. The specific provisions in relation to privacy contain forbiddance to publish the personal identification numbers on-line.
Directive 2002/58 on privacy and electronic communications has been transposed into national legislation (the Act No. 610/2003).

### 2.3.6 Licensing framework

The policy for sharing the GI between public institutions is included in the amendment of the Act on Geodesy and Cartography, which was approved by the Government. However there are still various approaches to licensing of data and services.

The provider provides the other natural or legal persons with datasets from the Automated Information System of the Geodesy, Cartography and Cadastre on the basis of a written contract.  

- The provider could refuse to provide datasets if the natural or the legal persons do not carry out their duties towards the provider, mainly in the area of the meeting the costs for the provided data. Neither the access to the datasets nor the datasets should be provided to third persons.

- The private companies can join this framework under the conditions specified in the legal system. The detailed law will be elaborated in the GCCA amended decree No. 178/96. This framework currently does not address the liability issues.

The licensing framework at the levels for sharing, trading and use of GI is covered by the Act on the Slovak Copyright, the Act on the Budgetary Regulation, the Act on the State Information System, the Act on the Administrative Charges. In the case where the above-mentioned acts cannot be applied, the Act about Prices is valid. This Act prescribes the negotiable prices. For schools and for research institutes the marginal charges are used.

The licensing framework GCCA should be enhanced.

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

**Funding**

Funding of the SDI-activities of the GCCA is mainly provided by the state budget. Part of the SDI linked activities are based on partial cost recovery. There is no yearly budget for the coordination activities, since these are linked to the central bodies of the state administration budgets.

The production and maintenance of the core datasets of the SDI are financed via the combined model of the central government funding and the cost recovery. The metadata service is financed via the central government funding.

On the regional level, funding through the EU structural funds is pursued. On the local level the creation and the maintenance of the thematic GIS-s, which are based mainly on the survey information file of the cadastre of real estates, are funded by municipalities.
Since 1995, the GCCA has been involved in the Phare programme, a grant initiative of the European Union for the support of the economic transformation process. The Programme Management Unit established by the GCCA ensures the implementation of projects supported by the European Commission aimed at the support of the real estate cadastre and the registry of land ownership.

In the framework of National Programme Phare 2003 the GCCA conducted a project *Land Administration and Cadastral Infrastructure*. In the framework of National Programme Transition Facility 2004 the GCCA conducted a project “*Strengthening the Efficiency of Cadastral Services*”.

The objective of the project *Land Administration and Cadastral Infrastructure* is meeting the requirements of the INSPIRE initiative and improving Land Administration based on spatial and cadastral data, including permanent Global Positioning System (GPS), in line with the concepts and directions proposed by the European Commission.

The objective of the project “*Strengthening the Efficiency of Cadastral Services*” is concerned with design, development and prototyping of an Electronic Registry with generic information, cadastral services and access to the forms.

Unfortunately, the long-term financial security of the SDI is still not secured by the legal framework, the GCCA budget being restricted.

**Pricing**

The conditions and the level of pricing for the provision of geographic services are established, but discussion within the GI community is proceeding permanently. All the state and budgetary organizations tend to get lower prices, while there is a tendency to increase cost recovery.

There are several laws, which have an effect on the pricing policy with regard to the GI, especially the Act on the Budgetary Regulation, the Act on the State Information System and the Act on the Administrative Charges. The above-mentioned acts define the basic rules and conditions for the provision of datasets owned by governmental bodies. In the case where these acts cannot be applied the Act about Prices is valid. This Act about Prices prescribes negotiation of prices. It is considered to be an advantage that the pricing policies applied between different bodies of the state administration are administered by common rules.

With regard to pricing of the GI-related PSI in general there is a marginal cost recovery policy. At present metadata are provided free of charge as well as the core datasets for the state administration bodies.
2.4 Component 3: Data for themes of the INSPIRE annexes

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

The published maps and derived geodatasets can be divided into

- Large-scale maps 1:1.000 up to 1:5.000;
- Medium-scale maps 1:10.000 up to 1:200.000;
- Small-scale maps 1:250.000 up to 1:1.000.000.

With respect of its contents, the state map series is divided into the basic state map series and the thematic state map series. The GCCA is responsible for compilation, updating, and editing of the basic state map series and some thematic state map series.

Basic state map series representing the state territory in a coherent way, its basic content can be used in different ways and it is compiled in accordance with uniform rules.

2.4.2 Data by resolution or scale range for the INSPIRE themes

Large-scale Maps & Geodatasets

Within this group are the maps at scales of 1:1.000, 1:2.000, 1:5.000 and other scales created for the purposes of the real estate cadastre. Within the framework of building a new cadastre, the vector map of stated documentations have been made and subsequently kept. On 1 January 2005, 67% of cadastral districts were processed in this way.

Medium-scale Maps & Geodatasets

The group of medium-scale maps is represented by a set of basic maps in S-JTSK and the Baltic Vertical Datum - after Adjustment. The map sheets are of a uniform format 630x470 mm. The cartographic symbol system and the method of their colour expression are harmonized.

- The Basic Map of the Slovak Republic 1:10 000 has been made by updating the 1:10.000 topographic map published before 1971 in S-42. In its compilation current aerial photos were used. The first edition was published carried out in the period 1972-1986. From 1987, systematic revision of the map series has been done using aerial photos in a differentiated cycle depending on the territory significance.

- The raster sets of the Basic Map of the Slovak Republic 1:10.000 was made by scanning the map print base of planimetry, lettering, hydrography, canopy and altimetry from 2,820 map sheets of the territory of the Slovak Republic and in the year 2000 has been updated. In January 2005 the updating of this
Basic Map will be finished. Brand new maps will be made by visualization of GIS data of the PD GIS.

- **The Basic Map of the Slovak Republic 1:25,000** has been derived from the Basic map of the Slovak Republic 1:10,000. The content of the maps are generalized during the cartographic processing. The first edition of the map started in 1973. 85% of the map sheets have been published.

- **The Basic Map of the Slovak Republic 1:50,000** has been made by cartographic re-editing of the previous map series published in S-42. The first edition in 1970-1971, covered the whole territory of the Slovak Republic. Regarding its wide use as a base for future basic and thematic state map series the map has been superseded regularly. The remake of the map to the Seamless Vector Map required annual updating of the most important features of the map content. The map is available as a colour copy from a plotter or in digital form.

- **The Seamless Vector Map 50** was completed as the spatial object-oriented database, which was created by vectorizing the scanned print bases of all 134 map sheets of the Basic map 1:50 000 in the Arc/Info environment. Individual features have been separated into 52 levels. In the year 2000, the layer of the boundaries of territory-administrative and territory-technical units were updated. Data is stored in nine basic thematic layers with lettering, type and attribute. Eight basic thematic layers are created in vector form. The item of lettering is attached in raster format.


- **The Basic Map of the Slovak Republic 1:100,000** is a downscaled version of the Basic map of the Slovak Republic 1:50 000. The first edition published in 1983 -1990. The map Revision is carried out according to requirements.

- **The Basic Map of the Slovak Republic 1:200,000** is a map derived from the Basic map of the Slovak Republic 1:50.000. The first edition was published in 1971 - 1972, and by 1997 two all-area revisions had been made.

Within the group of medium-scale maps, are also the maps of territorial units, published on the basis of chosen basic maps. They comprise:

- The District Map of the Slovak Republic edited and published on the basis of the Basic Map of the Slovak republic 1:50.000;

- The Region Map of the Slovak Republic 1:200.000 edited and published on the basis of the Basic Map of the Slovak Republic 1:200.000.

- **MSR 10** - the Map of the administrative division of the Slovak Republic. Was created from the map print base of the Basic map of the Slovak Republic 1:10.000. Vectorisation has been done in the GeoScan environment. The
vector map is in line with the current administrative units of the Slovak Republic.

**Small-scale Maps & Geodatasets**

The group of the small-scale maps includes:

- The Basic Map of the Slovak Republic 1:500,000 and the Basic map of the Slovak Republic 1:1,000,000. Both maps are published as a 6-colour print;

- The territorial and administrative division of the State is projected on the administrative maps at scales of 1:250,000, 1:400,000 and 1:500,000 and the maps of the administrative division of the Slovak Republic at scales of 1:400,000 and 1:1,000,000.

**The Primary Database for the Geographic Information System** is being created as a spatial object-oriented database in ETRS 89 and EVRS 2000 with the level of detail corresponding to the Basic Map of the Slovak Republic 1:10,000, by evaluation of aerial survey photos using digital photogrammetry and filling up basic attribute database. In the year 2003 the creation of digital vector planimetric component of a map started. This reference data will form the core of the National Spatial Infrastructure.

Basic registers are the national information systems that identify the basic units of society (natural persons, corporations, administrative units, cadastral area, real estate units, buildings including dwellings).

The use of the information system of the cadastre of real estates supports detailed mapping at large scales.

A digital model of the relief of Slovakia using vectorization of print bases of the altimetry component, part of the map 1:10,000 in cooperation with the TOPU was created.

Within the framework of international cooperation, the GCCA participates in activities with the EuroGeographics. The project **“Seamless Administrative Boundaries of Europe (SABE)”** as a vector database of administrative boundaries in Europe includes the boundaries of administrative units with identifiers, names and information on hierarchical level. The version of 1 May 2004 includes the territory of the Slovak Republic.

Within the framework of international cooperation, the GCCA participates in activities with EuroGeographics. The project **“EuroGlobalMap”** is a digital topographic dataset that covers Europe at the scale 1:1 Million. It is seamless and harmonised data and is produced in cooperation by the National Mapping and Cadastral Agencies of Europe, using official national databases. The version 2004 includes the territory of the Slovak Republic.

**The high quality forestry maps** - forest stand maps in scale 1:10,000, and updated simultaneously with forest management plan renewal every ten years, form the basis of
Slovak forestry mapping. They contain basic geographical data, terrain lines, detailed recognition of forest road network and footpaths and further important data relevant to forestry practice. Contour (uncoloured) forestry maps serve as a basis for the creation of various special forestry maps.
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2.4.3 Geodetic reference systems and projections

Spatial referencing is done by the Coordinate System of Uniform Trigonometric Cadastral coordinates, but not according to ISO 19111. For every map scale display and mapping the Kőovák’s conformable conical projection in general position is currently used.

*The Coordinate System of Uniform Trigonometric Cadastral Network* is defined:

- By Bessel’s ellipsoid with parameters $a = 6377397.155$ 08 m and $f = 1:299.152$ 812 853 where "a" is the length of main semiaxis and "f" is the flattening;
- By Kőovák’s conformable conical projection in general position;
- By the point coordinate file of the Uniform Trigonometric Cadastral Network.

Since 1996 the European Terrestrial Reference System (ETRS89) was introduced by the decree No. 178/1996 of the Geodesy, Cartography and Cadastre Office of the Slovak Republic by which the Act of the National Council of the Slovak Republic about Geodesy and Cartography is executed. The ETRS89 is in line with the ISO 19111.

*The European Terrestrial Reference System is defined:*

- by an ellipsoid of Geodetic Reference System 1980 with constants $a = 6378137$ m, $GM = 3986005 \times 10^8$ m$^3$s$^{-2}$, $J_2 = 108263 \times 10^{-8}$ and $\omega = 7292115 \times 10^{-11}$ rad.s$^{-1}$ where "a" is the length of the main semiaxis of the equipotential ellipsoid. "GM" is the geocentrical gravitational constant. "$J_2$" is the zonal geopotential coefficient of the second grade and "$\omega$" is the angular velocity of the Earth’s rotation, by European stations of the International Terrestrial Network of Reference Points.

For creating the Primary Database for GIS the European Terrestrial Reference System (ETRS89) is used.

There are algorithms available for conversion of coordinates from the Coordinate System of Uniform Trigonometric Cadastral Network to ETRS89.

**State Levelling Network**

Since 1997 the State Levelling Network is being built. Normal heights of the geodetic control points represented in the State Levelling Network of the 1$\textsuperscript{st}$ and 2$\textsuperscript{nd}$ order are determined in the European vertical reference network 2000 (European Vertical Reference System 2000 – EVRS 2000). In 2004, after summary adjustment the network will be registered in the United European Levelling Network (UELN).
Raster data are available in one of the following formats: CIT, TIFF or other formats which enables conversions (RLE, RLC, BMP, PCX).

2.4.4 Quality of the data

The quality of the reference data & core thematic data is tested by the internal procedures.

Update schedules vary with the datasets.

2.4.5 Interoperability

The GIS software being used by the GCCA for the Seamless Vector Map 1:50.000 and for the EuroGeographics’ projects is mainly ArcGIS, ArcSDE, ArcView. For the Primary Database for GIS, Intergraph software is used. Geo-Portal of GCCA is providing OGC compliant WebMapServices via Minnesota Map Server. Within the Environmental area the solutions from main GI vendors as Intergraph, ESRI, Bentley, MapInfo are being used. The usage of some interoperability supporting elements can be recognised, like ESRI interoperability tools (Open GIS WMS, FMS services, GML exchange). SEA is providing OGC compliant WebMapServices via ArcIMS Map Server.

2.4.6 Language and culture

Metadata (data dictionary) is provided. The original language is Slovak, and it is occasionally translated into English. For some datasets the metadata is available only in Slovak.

2.4.7 Data Content

The text explanation for the attributes and for the data dictionary will be contained in the catalogue, which is still being developed.

2.4.8 Geographical names

In 1995, the creation of a computerised dataset on the standardised names of non-residential geographical objects was started. It contains the names of the objects named on the Basic map of the Slovak Republic 1:10.000 and 1:50.000, location according to a cadastral district, inclusion in a higher administrative unit, location to the map sheet of the Basic map of the Slovak Republic 1:10.000, geographic coordinates, the date of standardisation, the previous form of a name with the period of validity, the feature of the object, and others. The database from the whole territory of the State will contain ca 70.000 names. The database was completed.

The geographical names are managed in Slovak language.
2.5 Component 4: Metadata

2.5.1 Availability of metadata for the data

Metadata are available for a part of the data. They are either of the exploration or exploitation type and partially allow assessment of fitness for use. Environmental area is covered by CDS metadata service. (See 2.5.1).

2.5.2 Metadata catalogues availability + standard

The Slovak Republic is preparing for adoption the standard ISO 19115 Geographic Information -Data description for Metadata. This standard needs to be implemented. It is not clear whether this has been implemented yet, or not.

Metadata catalogue: http://geonet.sk/main_en.htm - the geoportal also gives information on SDI stakeholders and offers applications for integration and distribution of interoperable geographical information resources. A user can also register at this website.

EnviroInfo: http://enviroinfo.enviroportal.sk
Geoportal: http://www.geoportal.sk
KatasterPortal: http://www.katasterportal.sk
EnviroGeoPortal: http://geo.enviroportal.sk

2.5.3 Dublin core metadata standards for GI-discovery

Not implemented.

2.5.4 Metadata implementation

The GCCA is responsible to coordinate and implement the metadata of the Primary Database for GIS, the Geodetic Control and the Cadastre Registries.

There is no standardised feature code-list within the metadata, There is no standardised thesaurus for use with the metadata, except usage of GEMET thesaurus used by CDS metadata service. There are no formalised update procedures for metadata.

2.6 Component 5: Network Services

2.6.1 On-line access service for metadata: discovery services

The Geoportal GCCA is on-line available (http://www.geoportal.sk/) as a pilot project. The GCCA Geoportal contains meta-information about documents, databases, vector spatial data and raster spatial data. Some of the reference and core thematic data and their
metadata can be found there. There is an English version available, but updating is stagnating. It is freely accessible.

The main metadata service for the Environmental sector in SR is CDS developed by SEA. CDS is on-line available (http://www.iszp.sk/katalog/index.html). The Slovak Environmental CDS contains meta-information about documents, projects, databases, vector spatial data and raster spatial data. Some of the reference and core thematic data and their metadata can be found there. There is an English version available, but updating is stagnating. It is freely accessible.

### 2.6.2 On-line access service for data: download services

For cadastral data there is on-line access service in Slovak language only (http://www.katasterportal.sk).

For some core thematic environmental data via SEA map server an on-line access service are available but currently in Slovak language only (http://www.sazp.sk/webmapy). The Landscape Atlas of Slovak republic (LASR) has been developed by SEA. There is on-line web service providing access to 400 maps containing 700 GI layers covering main areas of interest. Reference scale is 1:50 000. LASR is accessible via Enviropaortal (http://www.enviroportal.sk/atlas/atlassr/index.html). The English version is planned. No additional information has been found.

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

It is possible to combine published web map services from GCI (http://www.geoportal.sk) and SEA (http://atlas.sazp.sk) via INSPIRE GeoPortal (http://eu-geoportal.jrc.it/), or via Intergraph OGC WMS Viewer (http://www.wmsviewer.com).

### 2.6.4 OpenSource software and access services

The GeoPortal GCCA implements OGC standards in UMN Mapserver application and the WMS is operating.

The map services, developed by SEA with JSHAPE Java GIS Solutions, can serve as an example of open source GIS web services usage. These web maps are in Slovak language and are on-line accessible (http://www.sazp.sk/webgis/index.html).

No other information has been found.

### 2.6.5 Availability of viewing services

http://www.geoportal.sk_web maps service of the GCCA
Web mapping services that let the user browse city maps at various scales are provided by private companies and some municipalities, for example http://mapy.zoznam.sk, http://mapy.atlas.sk, http://supernavigator.sk

A service for cellular phone localisation has been established and provided by Orange Slovakia. The website in Slovak version: http://www.orangeportal.sk/lbs/ff/index.jsp

An example of geocoding service is a locator service for Bratislava provided by ArcGeo: http://www.arcgeo.sk/searcher/default.htm (English).

Another example of published GI data via webmap services (soil data and orthophoto) are available via Soil Science and Conservation Research Institute’s application for soil maps: http://www.podnemapy.sk/lpis/viewer.htm.

The access to both of them is free of charge.

New viewers were recently developed applying WMS standards. In addition some WCS services exist as well.

Geoportal (http://www.geoportal.sk) - WMS
SEA MapServer (http://atlas.sazp.sk) – WMS, WCS

2.6.6 Availability of catalogue services to regulate access

Not available.

2.6.7 Availability of catalogue services that perform payment operations

Through the GCI, GCCA operates a Cadastral Portal (www.katasterportal.sk). The English version is missing. The e-commerce services are incorporated.

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

No such applications were identified.

2.6.9 SDI user applications

Example of usage published webmap services can be found on tourist server “Hiking.sk” (http://hiking.sk/mapa/hkart_0.html).

2.6.10 Availability of geo-processing services

Not available.
2.7 Component 6: Thematic environmental data

The legal framework and funding principles (for reference & core thematic data) to thematic environmental data are the same as in the section 2.2. The reference data such as geodetic control, Primary Database for GIS, Cadastral Registries and above all Seamless Vector Map 1:50 000 created by GCCA are used for thematic environmental data creation and management.

MoE is responsible for management of production, handling and distribution of environmentally oriented datasets. The main stakeholders under the MoE responsible for environmental data are:

- Slovak Environmental agency
- Slovak Hydrometeorological Institute
- Slovak Water Management Enterprise
- Geological Survey of Slovak Republic
- State Nature Conservancy of the Slovak Republic
- Water Research Institute
- SSJ
- SMOPAJ

A metadata service, CDS-based, is available.
3 Annexes

3.1 List of SDI addresses / contacts for Slovak Republic

<table>
<thead>
<tr>
<th>Table: SDI contact list</th>
<th>Web address</th>
<th>Organisationa l mailing address</th>
<th>Over-all contact person: tel./fax/e-mail</th>
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<tr>
<td>National</td>
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<tr>
<td>The Research Institute of Geodesy and Cartography in Bratislava</td>
<td><a href="http://www.vugk.sk">http://www.vugk.sk</a></td>
<td>Chlumeckého 4, 826 62 Bratislava Slovakia</td>
<td>Mr. Juraj Vališ Tel.: +421 2 43335085 E-mail: <a href="mailto:valis@vugk.sk">valis@vugk.sk</a></td>
</tr>
<tr>
<td>The Geodetic and Cartographic Institute Bratislava</td>
<td><a href="http://www.gku.sk">http://www.gku.sk</a></td>
<td>Chlumeckého 4, 827 45 Bratislava Slovakia</td>
<td>Mr. Matej Klobušiak Tel.: +421 2 43415200 E-mail: <a href="mailto:klobusiak@gku.sk">klobusiak@gku.sk</a></td>
</tr>
<tr>
<td>The Statistical Office of the Slovak Republic</td>
<td><a href="http://www.statistics.sk/">http://www.statistics.sk/</a></td>
<td>Miletičova 3, 824 67 Bratislava Slovakia</td>
<td>Tel: +421 2 50 236 111 Fax: +421 2 55 42 45 87 E-mail: <a href="mailto:info@statistics.sk">info@statistics.sk</a></td>
</tr>
<tr>
<td>The Slovak Environmental Agency</td>
<td><a href="http://www.sazp.sk/index_en.html">http://www.sazp.sk/index_en.html</a></td>
<td>Tajovského 28, 975 90, Banská Bystrica, Slovakia</td>
<td>Mr. Martin Tuchyná Tel: +421 48 4132157 Fax: +421 48 4132160 Email: <a href="mailto:tuchyna@sazp.sk">tuchyna@sazp.sk</a></td>
</tr>
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### 3.2 List of references for Slovak Republic

<table>
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<tr>
<th>Web sites:</th>
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<tbody>
<tr>
<td>The Geodesy, Cartography and Cadastre Authority of the Slovak Republic</td>
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<td>Map of the Administrative Dividing of the Slovak Republic</td>
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<td>Ministry of the Environment</td>
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<td>Soil Science and Conservation Research Institute</td>
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<td>The Forest Management Institute</td>
<td><a href="http://www.lesoprojekt.sk/english/default.htm">http://www.lesoprojekt.sk/english/default.htm</a></td>
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<td>Topographic Institute in Banska Bystrica</td>
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<td>GIS Database of Bielovodska dolina</td>
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<td>Digital technical map of Prešov</td>
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| Publications: |


Nadežda Nikšová, Andrej Vojtičko,: Building of the Primary Database of the Geographic Information System as a component of the National Spatial Infrastructure. Geodetic and cartographic horizont, 49/91, 2003, č. 7-8, s.124-129.


| Brochure |

Geodesy, Cartography and Cadastre of the Real Estates in the Slovak Republic, authors of the texts: Mr. Badlik, Mr. Ficor, Mr. Hornansky, Mr. Klobusiak, Mrs. Niksova, Mr. Priam, Mr. Vojtico, 2nd issue, issued in May
<table>
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<td>Nadežda Nikšová, Andrej Vojtičko, “Building of GIS Fundamental Base as an Element of the National Space Infrastructure.” Geodetický a kartografický obzor, 49/91, 2003, č. 7-8, s. 124 – 129.</td>
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