Spatial Data Infrastructures in *Belgium:* State of play 2010

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6.5	2005-09-22	Danny Vandenbroucke	Final Report based on comments Commission
7.0	2006-08-24, 2006-10-19	Eric Bayers (IGN)	Update information on the FPGI (IGN, AGDP)
7.1	2006-12-22	Katleen Janssen	Review the legal and organizational aspects
7.2	2006-12-26	Danny Vandenbroucke	Review the Flemish and Federal SDI
8.0	2008-03-27	Katleen Janssen (ICRI)	Correction and update legal and organizational framework
8.1	2008-04-12	Danny Vandenbroucke, Ludo Engelen (SADL)	Integration results survey
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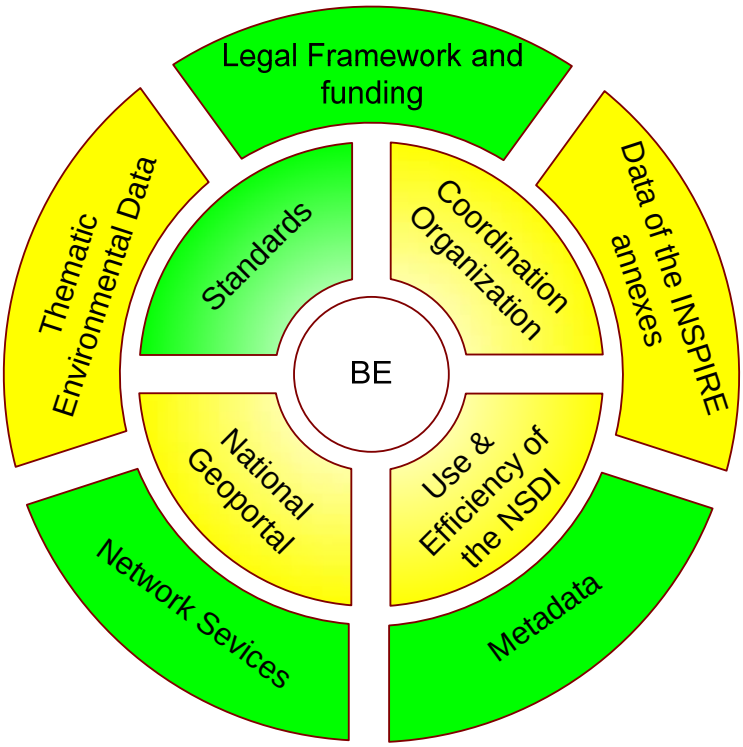
9.1	2010-06-08	Katleen Janssen (ICRI)	Review of the legal framework

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

In the federal state of Belgium, the major part of the territory-related competences has shifted over the recent years to the governments of each of the three regions (Brussels Capital Region, Flemish region, Walloon region). Hence a number of public sector users of GI are situated at the regional (government, public institutions) and the lower administrative (provincial, municipal) levels. As a result 3 distinct public regional SDI (RSDI) are being developed, focusing on the particular needs of the user communities they each serve. On the other hand, there is a Federal Platform for Geo-information (FPGI) created in 2004 by the National Geographic Institute and the General Administration of Patrimonial Documentation (former Cadastral Agency) who are both active at the Federal level, mainly as data producer of basic reference data.

Despite the fact that there are clearly one federal and 3 regional SDI initiatives/activities, and despite the fact that there is collaboration between the federal and regional levels and vice versa, one can not speak about an integrated national approach to build the Belgian SDI.

The federal level and all regions have to transpose the INSPIRE directive with regard to the data sets and services for which they are competent. For particular aspects regarding coordination and cooperation, the federal level and the regions have concluded a cooperation agreement. This agreement installs the INSPIRE Coordination Committee, composed of 2 representatives (1 from GAPD and 1 from the department with competence on geographic data) from each region and the Federal state, the Member State Contact Point, the Belgian representative in the Comitology procedure and the president of the Belgian INSPIRE forum.

The cooperation agreement has been signed by the competent ministers, and should be presented to the parliaments for validation in the course of 2010.

What the RSDI in the Flemish region and the SDI in the Walloon region have in common is that they essentially consist of a coordinated network of public institutions and bodies aiming at sharing and re-using GI to fulfil their public mandates. Whereas the Flemish RSDI had already started in 1995 on an informal basis and has been consolidated by a regional decree in 2000, the Walloon SDI is currently being developed and operating on a project basis. It is nevertheless obtaining a similar status as GDI-Vlaanderen and is even in line with modern technology and ISO-standards. The UrbIS-initiative in the Brussels Capital region has a more limited scope: a single institution has the mandate to serve the Brussels public sector with high quality base data.

The FPGI is focusing on following objectives: (1) to gather the various federal services that produce, use or manage geographical data; (2) to harmonize the different federal geographical datasets and (3) to support the access to the federal geographical datasets. The Platform wants to extend its activities to all relevant federal institutions capable to cover all the themes as defined in the annexes of the INSPIRE Directive.

Regarding the involvement of the private sector, the research sector, NGO's etc., the situation is remarkably different between the four SDI (i.e. three regional and one federal SDI). At the level of the federal state, the Brussels Capital Region and the Walloon region no explicit provision is currently made for non-public sector users. GDI-Vlaanderen on the other hand does so by opening up its advisory structures to these types of GI-users and -producers and by developing a clear pricing policy. In general, private actors mostly operate in a client-supplier relationship with the RSDI rather than as partners.

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Abbreviations and acronyms

AAPD / AGDP	General Administration of Patrimonial Documentation
AATL	Administration of Urban Planning and Housing
AGIV	Agency for Geographic Information Flanders (Agentschap voor Geografische Informatie Vlaanderen)
AKRED	Administration of the cadastre, registration and domains
BRIGIT	Base de Référence des Items Géographiques, Informatisée et Tridimensionnelle
Brussels UrbIS	Brussels Urban Information System
CAMET	Ministère wallon de l'Equipement et des Transports
CEN	European Committee for Standardization
CIBG	Centrum voor informatica voor het Brusselse Gewest - Informatics Centre for the Brussels Region
CLC	Corine Land Cover
CORINE	COR = Coordination, IN = Information, E = Environment
CRAB	Centraal Referentie Adressen Bestand
CTC	Comité Technique de Cartographie
DGATLP	Direction Générale de l'Aménagement du Territoire, du Logement et du Patrimoine
DCE	Direction du Contrôle et des Etudes
DEM	Digital Elevation Models
DTM	Digital Terrain Model
DGATLP	Direction Générale de l'Aménagement du Territoire, du Logement et du Patrimoine
DGPL	Direction Générale des Pouvoirs Locaux
DGRNE	Direction Générale des Ressources Naturelles et de l'Energie
DWTC	Federal Services for Scientific, Technical and Cultural Affairs
EGM	EuroGlobalMap
EGN	EuroGeoNames
ERM	EuroRegionalMap
ESDI	European Spatial Data Infrastructures
ETRS	European Terrestrial Reference System
EUROGI	European Umbrella organisation for geographical information
FIR	Further Investigation Required
FPGI	Federal Platform for Geo-information (FPGI
GAPD	General Administration of Patrimonial Documentation
GDI	Geographic Data Infrastructure

GDI-Vlaanderen	Partnership between Flemish Public Bodies to optimize the use of geographical information
GI	Geographical Information
GIRAF	Geographic Information Retrieval Application for Flanders
GIS	Geographical Information System
GPS	Global Positioning System
GRB	Grootschalig Referentie Bestand
ICT	Information and Communication Technology
IDELUX	Intercommunale d'Equipment de la Province de Luxembourg
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
ISO	International Organization for Standardization
KLIP	Cables and Pipes Information Portal
MADAME	Methods for access to data and metadata in Europe
MET	Ministère de l'Equipement et des Transports
MIVB/STIB	Brussels region transport operator
MRW	Ministère de la Région wallonne
MUGIRE	Multilingual GI Retrieval Engine
NIS / INS	National Institute for Statistics
NGI / IGN	National Mapping Agency
NGO	Non-Governmental Organizations
NSDI	National Spatial Data Infrastructure
OGC	Open Geospatial Consortium
PCNSW	Projet de Cartographie Numérique des Sols de Wallonie
PDA	Personal Digital Assistant
PICC	Projet Informatique de Cartographie Continue
PPP	Public-private partnerships
PSI	Policy and legislation on access to public sector information
RCC	Regional cartographic committee
REF	Reference data
RSDI	Regional Spatial Data Infrastructures
SBE	State Boundaries of Europe
SC	Support Centre
SC/GIS-Vlaanderen	Support Centre of Gis-Vlaanderen
SDI	Spatial Data Infrastructures
SGISR	Seamless Geographic Information System of Reference)
SPIDI	Spatial Information Directory; Thin client
STIPAD	System of Integrated Treatment of Patrimonial Documentation
UrbIS	Urban Information System

UrbMtaMa	UrbIS Metadata Manager
UrbSpw	Search for Public Way
UrbTlk	URBIS Toolkit
UrbVwr	UrbIS Viewer
UTM	Universal Transverse Mercator
VGC	Vlaamse Gemeenschapscommissie
VLM	Vlaamse Landmaatschappij - Flemish Land Society
WCS	Web Coverage Service
WFS	Web Feature Service
WMS	Web Mapping Service

1 GENERAL INFORMATION

1.1 Method

This report is summarizing the review of SDI in Belgium, and reflected the degree to which the SDI situation in Belgium is similar to the ideas set out in the INSPIRE position papers[1], in the INSPIRE scoping papers and in recently adopted INSPIRE Directive.

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

- www.gisvlaanderen.be (GeoPortal of the RSDI of the Flemish Region, in Dutch)
- http://cartographie.wallonie.be/PortailCarto/Maquette/index.php (GeoPortal of the RSDI of the Walloon region, in French)
- http://www.cibg.irisnet.be/ci/NL/Departementen/Geomat (GeoPortal of the RSDI of the Brussels Capital Region, in Dutch and French)
- http://www.ngi.be/NL/NL0.shtm (Portal of the National Geographic Institute)

The 2003 version of the report has been completed by integration and consolidation of comments received from representatives of the 3 regional and the federal SDI initiatives. Those comments were provided either in written form, either through interviews organized in the framework of the Activity 2 of the State-of-Play project. The 2003 version has been updated in the 2004 version after a revisit of the web sites and by integration of information from recent publications (e.g. Kinnaert and Leruth, 2003). The 2005 version was updated based on input from the experts from the RSDI of the Walloon region and the experts from the National Geographic Institute (Kinnaert, Vandeberghe, 2005). Information was also added for the RSDI of the Flemish Region based on other sources. The update of 2006 was based on new information received from IGN and General Administration of Patrimonial Documentation through Eric Bayers from IGN, and Pierrette Fraisse from GAPD. For the updates of the Flemish SDI, AGIV, a key document *"GIS-Vlaanderen, Uitvoeringsplan 2006"* was used. All this information was complemented with information obtained through visits to the websites of the different SDI initiatives and discussion with some of the stakeholders met on several occasions (IGN, AGIV). For the 2007 update, the NGI/IGN, the GAPD (General Administration of Patrimonial Documentation), AGIV and the Walloon Region sent information regarding the data sets, services and data sharing practices. This information has been integrated in the different chapters of the country report.

For the 2009 update the survey report was used along with the information extracted from the web and the various presentations/publications from workshops and conferences. Moreover, obsolete information from the previous versions was removed, while for the FPGI section a conclusion paragraph regarding the status of each indicator was added for each component.

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

1.2 The SDI-scene in Belgium

Belgium is a federal country in which some of the territorial matters are dealt with by the three regions: the capital region Brussels (BE1), the region of Flanders (BE2) and the region of Wallonie (BE3). The federal level through its National Geographic Institute - working in close collaboration with the General Administration of Patrimonial Documentation (Cadastre, Land Registration, State Properties, and Mortgages Services) – is since long active in the domain of GI and started recently to be active on the (N)SDI scene. Despite the fact that there are clearly one federal and 3 regional SDI initiatives/activities, and despite the fact that there is collaboration between the federal and regional levels and vice versa, one can not yet speak about an integrated national approach to build the Belgian SDI.

In 2004, the Federal Platform for Geo-information (FPGI) has been established by NGI / IGN (National Mapping Agency) and GAPD (General Administration of Patrimonial Documentation – AGDP/AAPD). The FPGI is focusing on following objectives: (1) to gather the various federal services that produce, use or manage geographical data; (2) to harmonize the different federal geographical datasets and (3) to support the access to the federal geographical datasets. The Platform wants to extend its activities to all relevant federal institutions capable to cover all the themes as defined in the annexes of the INSPIRE Directive.

The 5 provinces in Flanders have an explicit mandate to coordinate GIS-related matters of the provincial administration and of the municipalities. However, since provinces and municipalities are partners in the regional SDI, termed GDI-Vlaanderen, their lower level SDI are well integrated with the regional SDI and do not necessitate separate description. A few larger cities (e.g. Antwerpen, Gent) build upon the regional SDI to develop city-specific SDI-services for which a number of extra initiatives are taken, e.g. for data acquisition and delivery to citizens.

The (relatively) small Brussels Capital Region is developing an SDI (Brussels-URBIS) covering all municipalities and major utility services and companies. Brussels-URBIS can be regarded as a representative of the city-type of SDI.

The CTC (Comité Technique Cartographique – Technical Cartographic Committee) of the Région Wallonne, an intergovernmental and interdepartmental working group co-ordinates the INFRASIG project. This project began on February 2002. Its aims is to develop and operate a Regional Spatial Data Infrastructure (RSDI) compatible with the INSPIRE principles. The project defines and implements the most appropriate RSDI – organization, elaboration, management, distribution and maintenance of spatial data – to meet the requirements of the regional and local authorities, non-governmental companies, private sector and citizen. At the provincial and city level, a few initiatives or prototypes have been achieved.

The National Geographic Institute (www.ngi.be) is an important data producer for Belgium as a whole. The NGI has the mandate to maintain the national spatial reference systems and represents Belgium at several international forums. It is semi-public under the supervision of the Minister of Defence of the Federal Government. The NGI has

started to provide SDI-related services with respect to the territorial mandates of the federal government.

Another key producer of GI is the General Administration of Patrimonial Documentation, (Cadastre, Land Registration, State Properties and Mortgage Services) which depends on the Ministry of Finance of the Federal Government. GAPD is notably responsible for the updating and distribution of cadastral information. It embarked on an ambitious modernization program in the course of 2003. The final goal of this program is the implementation of a full integrated GIS (CadGIS). This program also includes the full digitization of the cadastral data and the cadastral services, in collaboration with the NGI and the regions.

The "co-ordination committee for digital geographical information" is the Belgian member of EUROGI. It is a de facto organisation that was founded in 1986 and aims at coordinating, stimulating, encouraging and supporting the use of digital geographical information in Belgium. In reality, this committee has little influence on the SDI-scene.

In this report we describe the three regional SDI-initiatives, which together cover Belgium completely. The federal initiative FPGI is described in further detail as a separate SDI in this update: it is clear that it presents scope for development into a major 'umbrella' SDI in the future.

1.3 Common ground for the selected SDI-initiatives

The four selected and described SDI-initiatives in Belgium are built on partially common ground. The common elements are described in this section to which the SDI-specific sections make reference.

1.3.1 Cooperation agreement

In Belgium, the federal level and all regions have to transpose the INSPIRE directive with regard to the data sets and services for which they are competent. For particular aspects regarding coordination and cooperation, the federal level and the regions have concluded a cooperation agreement. This agreement installs the INSPIRE Coordination Committee, composed of 2 representatives (1 from GAPD and 1 from the department with competence on geographic data) from each region and the Federal state, the Member State Contact Point, the Belgian representative in the Comitology procedure and the president of the Belgian INSPIRE forum.

The cooperation agreement has been signed by the competent ministers, and should be presented to the parliaments for validation in the course of 2010.

1.3.2 Policy and legislation on access to public sector information (PSI)

Belgium embraced the concept of open and free access to PSI. In this respect it introduced a whole myriad of primary and secondary legislation on the subject of access to public documents and open government, such as -but not limited to-

- The federal Law of 11 April 1994 relating to access to government information;
- The federal law of 5 August 2006 on public access to environmental information;
- The Ordnance of the Council of the Brussels Region of 30 March 1995 on access to public administration;
- The Ordnance of the Council of the Brussels Region of 18 March 2004 on access to environmental information;
- The Ordnance of the Council of the Brussels Region of 18 March 2004 on access to environmental information;
- The Flemish Decree of 26 March 2004 relating to access to government information;
- The Decree of the Walloon Region of 30 March 1995 relating to access to government information.

Directive 2003/98 on the re-use of public sector information has been transposed by the following legal instruments:

- The federal Law of 7 March 2007 and the Executive Decisions of 29 October 2007 and 29 April 2008;
- The Decree of the Walloon Region of 14 December 2006;
- The Decree of the Walloon Region of 14 December 2006 regarding the competences it exercises of the French Community
- The Decree of the French Community of 25 January 2007;
- The Decree of the German Community of 18 December 2006;
- The Flemish Decree of 27 April 2007 and the Executive Decisions of 19 July 2007 and 8 October 2007;
- The Brussels Ordnance of 6 March 2008.

1.3.3 Legal protection of GI by intellectual property rights

The Belgian law of 30 June 1994 concerning Copyright and Neighbouring Rights does not expressly mention maps, plans and other works related to geography or topography as being capable of attracting copyright (contrary to the Berne Convention and many other national copyright laws). They do however fall within the category 'works of literature'.

According to article 8, §2 of the above Copyright Law, there is no copyright on official documents (e.g. decrees, laws) of the government. Other data produced by the public sector (e.g. geospatial information) can however qualify for copyright protection and can thus be managed and exploited by the public authorities if this data meets the legal conditions for copyright protection.

The Belgian law of 31 August 1998 concerning the legal protection of databases (implementation of Directive 96/9/EC of 11 March 1996) and the Belgian law of 30 June 1994 concerning the legal protection of computer programs (implementation of Directive 91/250/EC of 14 May 1991) could also offer legal protection to GI and GIS.

The 2001 Directive on copyright in the information society was transposed by the law of 22 May 2005, which includes amendments to the Copyright law and the law on the protection of databases.

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

The general Belgian legislation on the protection of personal data applies, i.e. the consolidated text of the Belgian Law of 8 December 1992 on Privacy Protection in relation to the Processing of Personal Data (as modified by the Law of 11 December 1998 implementing Directive 95/46/EC), and the Royal Decree of 13 February 2001 which is secondary legislation providing for the enforcement of the law and outlining the practical measures for the application of the law.

Directive 2002/58 on privacy and electronic communications was transposed by the Law on electronic communication of 13 June 2005.

1.3.5 Geodetic reference systems and projections

Spatial referencing is done by coordinates, but not according to ISO 19111.

Till recently, IGN used the Belgian Datum 72 (BD72) with Lambert-72 map projection. It was decided in 2005 to introduce a new geodetic reference system BeRef, with Lambert-2005 map projection, re-parameterized today in Lambert-2008. An Online transformation module is provided at: http://www.ngi.be/NL/NL2-1-9.shtm

Tools are available for conversions and transformations of coordinates: Dynamic-link library for Windows and Linux, and the program cConvert Version 5.01.1; these tools allow transforming coordinates between the various following systems used in Belgium since 1972, and the associated map projections (http://www.ngi.be/NL/NL4-4.shtm):

Reference Systems

BD72 (Belgian Date 1972)

ED50 (European Datum 1950)

ETRS89 (European Terrestrial Reference System 1989)

projections:

Lambert 1972
Lambert 2008
UTM-
ETRS_LCC
ETRS_LAEA

2 Details of SDI #1: Brussels Urbis

2.1 General Information

Name: UrbIS

Official address: Centrum voor Informatica voor het Brussels Gewest, Departement Geomatica. Kunstlaan 21, Bus 10, 1000 Brussel; Tel: +32-2-282.47.70; Fax: +32-2-230.31.07

"Brussels UrbIS" (Brussels Urban Information System) is an integrated collection of very large scale reference and core thematic geographical and alphanumerical databases (UrbIS Fot, UrbIS Top, UrbIS Base containing UrbIS Adm and UrbIS Map, Urbis Parc) relating to the territory of the Brussels Region. These databases contain general information. The "Brussels UrbIS" products should therefore be considered as core data which users can consult and/or complete. All products are put at the disposal of public administrations and the private sector. The CIBG is the exclusive distributor of the "Brussels UrbIS" data. It also offers assistance to users who want to develop applications for the digital maps. Those applications may be served through geo-portal http://www.cibg.irisnet.be/site14/plone/departements/services/urbis. Currently this is the case for the e.g. Spatial Destination Plan and the real-time Brussels Info Traffic Centre.

The RSDI of the Brussels capital region is further named according to this main product it offers to its users 'Brussels UrbIS'.

2.2 Component 1: coordination and organizational issues

In the Brussels Region the CIBG is the main actor in the regional SDI UrbIS (http://www.cirb.irisnet.be). The CIBG (*Centrum voor informatica voor het Brusselse Gewest* - Informatics Centre for the Brussels Region) is a government institution whose main task is to help the other institutions of the Brussels Region in using ICT. As from its foundation in 1987 it has been involved in the promotion of E-government, which became a reality through a number of its products.

The department of Geomatics of CIBG (http://www.cirb.irisnet.be/site14/plone/departements/services/urbis) is responsible for the maintenance, the elaboration, the promotion and the distribution of the "Brussels UrbIS".

The political responsibility of Brussels- UrbIS lies with the Minister of the Brussels capital region, responsible for Informatics. A Regional cartographic committee (RCC), the so-called decision pool, has decisive power. It is composed of 3 delegates from the regional authorities and 2 delegates from 7 utility companies who participate in the SDI. The presidency of the Committee is with a representative of the responsible minister.

The host institute for Brussels UrbIS is the Centre for Informatics of the Brussels Capital Region. It is mandated by the Brussels regional government to execute the RCC-

decisions. Users of Brussels- UrbIS are organised in a users-pool, composed of an advisory committee, user-oriented work groups and a user's club. The latter is meant to share experiences of using the Brussels UrbIS product and services.

A technical pool is responsible for technical advice with respect to further development of Brussels UrbIS.

2.3 Component 2: Legal framework and funding

2.3.1 Legal framework

The current legal framework for the Brussels SDI consists inter alia of the following two Decisions. The Decision of the government of the Brussels Region of 19 May 1994 charges the CIBG with all assignments regarding the promotion, distribution and service provision to the users of the product "Brussel UrbIS". The Decision of the government of the Brussels Region of 4 July 1996 determines the pricing of the services that are offered in the framework of the assignment to promote, disseminate and provide assistance to the users of the product "Brussels UrbIS". In the same decision, the CIBG is charged with a number of assignments and services, such as the dissemination under licence constraints of "Brussels UrbIS" and the realisation of cartography activities.

The Brussels region has not transposed the INSPIRE directive yet. A draft text is currently being prepared by the Ministry.

2.3.2 Public-private partnerships (PPPs)

7 Utility companies participate and co-finance the Brussels- UrbIS. UrbIS also has a limited number of non-exclusive strategic partnerships, e.g. for e-government purposes.

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

See 1.3.1

2.3.4 Legal protection of GI by intellectual property rights

See 1.3.2

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

See 1.3.3

2.3.6 Licensing framework

Since 1 May 2009, access to the Urbis data is free of charge for non-commercial use and the use is allowed within the limits of a licence, the terms of which are accepted by downloading the products. Some products are reserved for the public authorities of the Brussels Region only. However, a request can be made to make the data available to other parties. All other data can be downloaded from http://www.irisbox.irisnet.be/. Users have to register and log in with their electronic ID-card. The user can use the data or products for internal purposes, print out the results and pass these results to third parties. Attribution is required.

2.3.7 Funding model for SDI and pricing policy

The funding model of Brussels UrbIS is a combined model which encompasses both grants and cost recovery mechanisms.

Pricing policy

See 2.3.6.

2.4 Component 3: Data for themes of the INSPIRE annexes

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

Only 1 scale level is recognized and supported by Brussels- UrbIS:

- Very large scale: equivalent to resolution of printed topographic maps at scale 1:1.000 or larger (Local (cadastral) scale).

2.4.2 Data by resolution or scale range for the INSPIRE themes

The Brussels- UrbIS -product is composed of 6 sub products:

- UrbisFOT
- Urbis ORTHO
- UrbisTOP
- UrbisADM
- UrbisMAP
- UrbisPARC

Brussels UrbIS Fot (UrbFot) is a collection of aerial non-corrected photographs which served the creation and update of the large scale mapping. Only part of these photographs is available in digital format. A first set of photos has been acquired on 13 April 1995. A second set, dates from 1 and 2 may 1999. The latter set has been acquired in suboptimal

weather conditions. The vegetative development prevented already the accurate determination of land use.

Brussels UrbIS Ortho (UrbIS-Ortho) these are the same aerial photos after a series of operations aimed at distortions due to terrain, perspective, etc.

Brussels UrbIS Top (UrbTop) is the vectorial database constructed from photogrammetry and surveying, scale 1:500. It contains:

- Buildings;
- Separations;
- Relief;
- Streets and street infrastructure;
- Municipal boundaries;
- Railways;
- Water courses and water surfaces.

Additional data layers are available but use by third parties is more restricted:

- Iso-elevation lines;
- Buildings, secondary constructions, towers;
- Trees along principal roads;
- Detailed road and street infrastructure: light poles, phone cells, electrical nodes, waste bins, shelters, …;
- Parking lots, …;
- Public transport lines, tramway lines, stops.

Brussels UrbIS Adm (UrbAdm) is the database with the administrative subdivision of Brussels Capital Region. It contains spatial and alphanumeric information for objects. Most objects are of an administrative nature. Some are of a physical nature, e.g. buildings and blocks of houses. Among the alphanumeric information, are the official cadastral codes, codes form the national statistical institute, the national register and from municipalities.
As such, UrbAdm is an interesting basis for further extension with commonly available alphanumeric data and with user-collected data:

- Statistical Entities;
- Zip Entities: postal zones;
- Cadastral Entities;
- Private Domain Entities;
- Public Domain Entities.

UrbIS Map (UrbMap) is a layer derived from UrbAdm and UrbTop. It is meant as base map for the 1:1.000 scale. It does not contain alphanumeric information and is limited to following objects:

- Boundaries of region;
- Boundaries of municipality;
- Walking paths;
- Housing blocks;
- Public street: street name;
- Building;
- Address and house number.

UrbAdm and UrbMap together constitute the UrbBase product.

UrbIS P&B is a vectorial database of plots and buildings (UrbIS-P & B) which corresponds to the cadastral data made available exclusively for public bodies in Brussels by the administration of the Cadastre.

Large scale topographic datasets from the National Geographic Institute (equivalent to resolution of printed topographic maps at scales between 1:10.000 and 1:25.000-1:50.000 (Local and Regional Scale) are indirectly available through Brussels-UrbIS.

2.4.3 Geodetic reference systems and projections

The Belgian Lambert Conformal Conical projection of 1972 is used for all purposes which are relevant for Brussels- UrbIS, including the large (local) scale display and mapping and the storage and processing of raster data.

See also 1.3.5

2.4.4 Quality of the data

Quality is related to resolution and scales of publication. It is not explicitly based on user's perspectives:

- There is no standardized, systematic quality control process for attributes of objects;
- Quality is not tested according to a standardized, systematic procedure;
- Quality advice is limited to non standardized documentation;
- The update schedule depends upon the geodatasets and is not systematic;
- Changes are managed by time series of snapshot datasets; previous versions of geodatasets and their metadata remain available;
- Accessing change-only information is generally not provided for;
- An in-house developed portrayal standard for symbolizing geographic information is in use.

2.4.5 Interoperability

- The dominating GIS-software in the user-organisations of Brussels-URBIS is MicroStation (50%), AutoCAD (10%), STAR (16%), and ESRI (8%)

- Software-related data-converters are available.
- Conceptual schema language and rules for application schema are not in use.

2.4.6 Language and culture

- Metadata, documents are systematically provided in French and Dutch.
- No standardized glossary of terms is in use.

2.4.7 Data Content

No information has been found about the availability of explanation of attributes and of a data dictionary.

2.4.8 Geographical names

Geographical names are managed in the languages French and Dutch.

2.4.9 Character sets

No information has been found.

2.5 Component 4: Metadata

2.5.1 Availability

The Brussels UrbIS product is accompanied by metadata focusing on the structure of the geodatabase and geodatasets, rather than describing the characteristics of the data in terms of the 'Discovery – Exploration – Exploitation' philosophy. Fitness for use cannot be assessed from these metadata.

2.5.2 Metadata catalogues availability + standard

No true metadata catalogue is available. See sections 2.4.1 and 2.4.4.

2.5.3 Metadata implementation

The URBIS-type of metadata is implemented by the coordinating agency CIBG. No standard feature code-list or thesaurus is in use. The existence and use of formalised update procedures need to be investigated. The cost for metadata collection and management is not clear.

The UrbMtaMa-application (UrbIS MetaDataManager) contains several functions to edit the UrbIS metadata, i.e. create, modify, add and delete UrbIS metadataobjects.

The Urbis-Metadata are meant to:

- Describe the content of the databases;
- Clarify the complex structure of the databases using the "object"-concept;

- Allow for simultaneous use (data interoperability) of data coming from more than 1 database (format, localisation);
- Facilitate the use and processing of the data;
- Define the symbology for presentation of the data.

The UrbIS metadata are stored in a structured database (ACCESS).

2.6 Component 5: Network services

2.6.1 Availability of web mapping service(s): View Services

A web mapping service for the UrbIS-database is available at http://geowebgis.irisnet.be/webgis_nl/viewer.htm .

2.6.2 SDI user applications

Examples of applications developed by users based on data UrbIS:

- The site map www.brugis.irisnet.be (Administration of Urban Planning and Housing (AATL) of the Brussels-Capital Region) allows users to view interactive maps related to land use and the planning.
- The site www.shopinbrussels.be Atrium, developed by the Agency allows users to find all the shops downtown and many other areas of Brussels.
- The site www.vgc.be developed by the Flemish Community (VGC) allows citizens to locate all the agencies that are associated with it.
- The site http://www.stib.be/index.htm?l=en developed by the STIB is used to find the best route to travel within the region by public transport.
- The site www.bruxellesenvironnement.be offers several interactive maps on the green areas of the Region of Brussels-Capital which rely on data by UrbIS.

5. Other applications

Other applications have been or are being developed by the SDI and or the client municipalities or utility companies. Examples are:

- At http://geowebgis.irisnet.be/webgis/geoloc?lngApp=nl an address finding service is available;
- **GeoLoc** (http://geoloc.irisnet.be) is a geolocation application allowing users to search an address and display it on the map and also create their own interactive map that can insert into their own site.

Since March 2009, the Brussels Region has two new thematic web portals managed by Brussels Mobility.

- The first is devoted to **mobility** (http://www.bruxellesmobilite.irisnet.be/) and gives users information on traffic in real time in Brussels and the means of getting around the city.

- The portal **Venue** (http://www.bruxellesespacespublics.irisnet.be/) for public spaces and amenities in Brussels.

2.7 Component 6: Thematic environmental data

Brussels URBIS is not dealing with environmental data. It provides general purpose spatial data to the environmental institute of the Brussels Capital Region but there is no two-way communication and exchange of data.

3 Details of SDI #2: GDI-Vlaanderen

3.1 General Information

Name: GDI-Vlaanderen (http://www.agiv.be)

Official address: Ondersteunend Centrum GIS-Vlaanderen; Afdeling van de Vlaamse Landmaatschappij, Gebroeders van Eyckstraat 16, B-9000 Gent; Tel: +32-9-261.52.00; Fax: +32-9-261.52.99 .

3.2 Component 1: Coordination and organizational issues

GIS-Vlaanderen was created in 1995 as department of the Vlaamse Landmaatschappij (VLM, Flemish Land Society). The political responsibility for geographic data lies with the Minister-President of the Flemish Government. In February 2009, a new decree was adopted in order to implement the INSPIRE directive, to expand the structures of GIS-Vlaanderen to GDI-Vlaanderen (Geographic Data Infrastructure Flanders), and to be in line with existing legislation on access to and re-use of public sector information. GIS-Vlaanderen is gradually being replaced by the GDI.

The objective of GDI-Vlaanderen is to optimise the creation, the maintenance, the exchange, the use and the re-use of geographic data sets and services between all public authorities in the Flemish Region. Its operation is defined and steered by a Steering Committee, composed of delegates of the different partners. The GDI-Board represents the stakeholders outside of the public sector.

The AGIV (Agentschap voor Geografische Informatie), an external autonomous agency, is responsible for the operational development of the GDI. It is mainly supporting the development and functioning of the SDI but also plays a role in data production, e.g. through the production of large scale reference data (GRB), and through various A/D-conversion and other projects (e.g. KADSCAN, KADVEC, Land Use map from LANDSAT-images, …). Based on the decree of 14 April 2004, it is now also officially responsible for the GRB-project.

3.3 Component 2: Legal framework and funding

3.3.1 Legal framework

GIS-Vlaanderen received legal status by regional Decree of 17 July 2000 as a collaborative undertaking of the Flemish Community, the Flemish Region, the Flemish public institutions, provinces and municipalities. Since the Decree of 20 February 2009, GIS-Vlaanderen is gradually being replaced by GDI-Vlaanderen, which includes all public authorities in the Flemish Region.

The decree of 20 February 2009 includes obligations for the public authorities to add geographic data and services and metadata to the SDI. This includes data or services that

are included in the annex to the decree (based on the annexes of the INSPIRE directive) and other data or services that the Steering Committee deems needed. The decree also includes rules on access and use of the metadata, data and services for public authorities within Flemish Region and other public authorities. Next, it also holds provisions on funding and pricing, on interoperability, on authentic sources, network services, the geoportal, public access, monitoring and reporting, and coordination.

For the decree to be fully operational, a number of executive ordinances were needed. First, the ordinances concerning the constitution and appointment of the GDI steering committee and GDI council were published. In October 2010, the ordinance on the conditions for the use of spatial datasets and services by the public bodies within the Flemish Region for the purpose of performing their public task was published. With this ordinance, all articles of the decree enter into force.

3.3.2 Public-private partnerships (PPPs)

Up until now neither GIS-Vlaanderen, nor GDI-Vlaanderen have entered into a PPP with a private sector company. Earlier, GIS-Vlaanderen nevertheless chose to opt for some form of co-financing -rather than for a PPP in the true meaning of the word-, which means that the private sector -in case the utility companies- would contribute 50% of the total costs of the GRB-project. The steering of the project remains in the hands of the Flemish government, given the strategic importance of GRB for policy purposes. From negotiations with the utilities sector appeared their readiness to contribute this 50% over the next 12 years of development of the GRB. An internal cost-sharing ratio per utility activity has been developed.

3.3.3 Policy and legislation on access to public sector information (PSI)

The decree of 20 February has amended the Decree of the Flemish Region on the re-use of public sector information, and has given the authority to the Steering Committee of GDI-Vlaanderen, rather than to each data provider itself, to determine the conditions under which the spatial data sets and services that are part of the GDI can be re-used. The Steering Committee is currently considering these conditions.

3.3.4 Legal protection of GI by intellectual property rights

See 1.3.2

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

See 1.3.3

3.3.6 Licensing framework

The GDI-Decree provides that the Flemish Government can determine the conditions under which the public authorities within and outside the Flemish Region can use the spatial data sets and services included in the GDI for the purposes of performing tasks in the public interest. This executive decision has been approved and signed and was published in October 2010.

This decision includes the conditions and terms of use of geographical data and services that are part of the Flemish SDI for GDI-Vlaanderen participants (these are all Flemish public bodies). So between public Flemish bodies, there is no more need for licences. The participants of GDI-Vlaanderen can use all the data and services that are added to the SDI for free for tasks in the public interest.

.With regard to the use of the spatial data sets and services by third parties, the Steering Committee can decide on the conditions. Such conditions are currently under discussion.

With regard to the GRB, access for the public authorities of the Flemish Region, the utility companies, and third parties is organised by an executive decision of the Flemish Government of 30 October 2009. The decision contains the conditions for public bodies for the performance of their tasks in the public interest, for non-commercial use and commercial use. A model licence and standard fees have been published in an additional Ministerial decision.

3.3.7 Funding model for SDI and pricing policy

The funding model in Flanders is a combined model which encompasses mainly grants, but also some payments for data and services. According to the Decree of 20 February 2009, the GDI is financed by an annual grant of the Flemish Region central budget, the payments to the AGIV for access to the GDI, the payments to the AGIV for its services, grants from the Flemish region for the realisation of the GDI implementation plan; grants for maintenance of the authentic sources, and possible contributions for the joint creation of geographic data, services and metadata.

In the past, AGIV has for instance received, next to its annual grant, funding for the KADSCAN-project in cooperation with the federal cadastre. Another interesting example is the GRB-project for which AGIV receives special funds from the Flemish government, but which is also being co-financed by the private sector (utility companies). For the maintenance of this central database, direct contributions are also expected from all levels of government.

On the presentation from AGIV on the Flanders GIS (2008) the resources list is presented below.

Pricing policy

Before the Decree of 20 February 2009, a differentiated pricing mechanism was used, depending on the source of the dataset (e.g. originating from the government, purchased from a private sector company), the type of customer (e.g. GIS-Vlaanderen partner,

public institution not participating in GIS-Vlaanderen, private sector company, educational institution), the intrinsic value of the dataset and the intended use of the datasets (e.g. commercialisation, governmental policy making). However, the Decree has installed free access and use of geographic data and services by the public bodies within the Flemish Region for all their tasks in the public interest. For use by any other public bodies, the Flemish Government can determine the fees.

Concerning public access, a lot of GI which has been gathered by GDI-Vlaanderen can already be freely consulted on-line by everyone via http://www.gisvlaanderen.be/geo-vlaanderen/nl/loketten.asp ('free access'). For re-use by third parties, the Steering Committee can make decisions on the charges. However, this is still under development. Currently, each participant of GDI-Vlaanderen determines -in consultation with the Steering Committee- its own conditions under which its GI can be put at the disposal of third parties.

3.4 Component 3: Data for themes of the INSPIRE annexes

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

GDI- Vlaanderen has a range of products tailored to the user (Regional plans, topographic maps, digital elevation models, orthophotos, GRB,…). Three scale levels are recognized and supported by GDI-Vlaanderen:

- small scale: equivalent to resolution of printed topographic maps at scale 1:50.000 or smaller (National scale)
- large scale: equivalent to resolution of printed topographic maps at scale 1:10.000 or larger (Local (Cadastral) scale) ; moreover, the GBR (http://www.agiv.be/gis/producten/?artid=371) mapping obtains terrain data with a precision that allows a normal use of the scale 1 / 250 - 1 / 2500
- middle scale: equivalent to resolution of printed topographic maps at scales between 1:50.000 and 1:1:10.000 (Regional Scale).

3.4.2 Data by resolution or scale range for the INSPIRE themes

The list with datasets added to the Flemish SDI can be found on the AGIV website:

http://www.agiv.be/gis/projecten/?artid=1240. The GDI-Vlaanderen datasets are marked in a darker colour. This list contains also the datasets for the other regions and the federal level. It was part of the official INSPIRE country monitoring and reporting for 2009.

A number of data sets are available or accessible through AGIV as regional SDI. The data can be discovered viewed and downloaded. Some of the data sets are originating from other data custodians. Additional information can be found on-line in the meta-database:

http://metadata.agiv.be/

A complete list will be presented in the updated report including the information provided by the country in 2010.Geodetic reference systems and projections

3.4.3 Geodetic reference systems and projections

See 1.3.5

The spatial characteristics of object types are not systematically described in the metadata catalogue.

3.4.4 Quality of the data

Quality is based on resolution and scales of publication. It is not explicitly based on user's perspectives:

- There is no standardized, systematic quality control process for attributes of objects;
- The metadata catalogue has provision to include the quality assessment and description:
  - Positional accuracy and precision;
  - Logical consistency;
  - Completeness (errors of (c)omission) of spatial objects;
  - Temporal accuracy, but not according to ISO19108.
- Quality assessment is however not available for all reference and core thematic datasets;
- Quality is not tested according to a standardized, systematic procedure;
- Quality advice is limited to metadata and non standardized documentation;
- The update schedule depends upon the geodatasets and is not systematic;
- Changes are managed by time series of snap shot datasets; previous versions of geodatasets and their metadata remain available.
- Accessing change-only information is generally not provided for;
- No portrayal standard for symbolizing geographic information is in use.

3.4.5 Interoperability

- The dominating GIS-software in the partner-organisations of GDI-Vlaanderen is from the ESRI-family. GDI-Vlaanderen distributes geodatasets in ESRI-formats but also in other software-related formats.
- Software-related data converters are available.
- ESRI's .SHP-format and XML are considered the reference exchange-format.
- Raster imagery is distributed in geoTIFF-format mainly.
- Conceptual schema language and rules for application schema (XSD) are in use.

3.4.6 Language and culture

- Metadata is provided. The original language is Dutch and is not translated.
- SDI accompanying documents are available in Dutch only.
- A feature catalogue (data dictionary) is available.
- A consolidated, standardized glossary of terms does exist.

3.4.7 Data Content

There is text explanation for attributes in the metadata, but availability is not systematic.

3.4.8 Geographical names

Geographical names are managed in the Dutch language. Geodatasets covering (parts of) the other Belgian regions (Brussels Capital Region and Région Wallonne) may contain names in French as well.

Neither primary, nor secondary name sets are used.

3.4.9 Character sets

No information has been found.

3.5 Component 4: Metadata

3.5.1 Availability of metadata

Exploration metadata are available for all of the reference and core thematic geodatasets. Completeness of the metadata is satisfactory for a significant part of the data. Completed metadata records allow the user to assess the fitness for use.

3.5.2 Metadata catalogues availability + standard

A metadata catalogue is progressively developed and maintained since 1997. In June 18, 2008 The Flanders GIS steering committee approved the ‘metadata standard for Flemish Geography – GIS Flanders metadata profile’ as a metadata recommendation document (available at : http://www.agiv.be/gis/downloads/?SID=48).

AGIV has converted its existing CEN based metadata repository to an ISO 19115 compliant repository and built an online application to query, edit and manage this repository (http://metadata.agiv.be). Because AGIV could start from its CEN based metadata repository, a comprehensively ISO compliant metadata repository could be built relatively quickly. The disadvantage related to this conversion process was that the mapping between metadata elements in the different standards was not easily made. The metadata authors had to upgrade their metadata into the more complex ISO 19115 model.

The metadata repository is based on the SDI-Flanders metadata profile for spatial data sets (ISO 19115). The SDI-Flanders profile implements the INSPIRE implementing rule for metadata and extends it with extra elements about quality and distribution. To fulfil user needs, AGIV also implemented metadata for feature catalogues using the ISO standard 19110 as well (Nolf et al., 2009).

3.5.3 Dublin core metadata standards for GI-discovery

No particular provision is made for implementing the DUBLIN-core set of metadata.

3.5.4 Metadata implementation

AGIV is the coordinating authority for metadata implementation. However responsibility for creation and supply of metadata lies with the data producers. AGIV provides the tools and support in using the tools and formal training possibilities.

Update of metadata is on a voluntary basis by the data producers. Discipline for update is generally low, except for data produced and distributed by AGIV.

Metadata management requires one full time person.

Metadata publishers can describe, create, update, delete, and publish metadata using the online metadata application. Users can discover, either by browsing or querying, metadata and view and/or download the metadata set(s) that match with the search terms. Metadata records can be exported to ISO 19139 compliant XML or a PDF document. The metadata repository is centrally managed by AGIV. AGIV is also adopting the implementing rules on discovery services in Flanders. Therefore, an experimental CSW service has been set up which enables querying the metadata repository.

The metadata of the data sets owned by AGIV are 100% synchronised, while at present the metadata of other members of GIS-Flanders does often not reach this level. Currently, the need for metadata services in Flanders is limited as services are currently under development.

Future challenges for AGIV shall be the implementation of the remaining components of the INSPIRE Directive. This includes the integration of the metadata application and metadata services with view (WMS) and download (WFS, WCS) services, and web applications (Nolf et al., 2009).

3.6 Component 5: Network Services

A test portal is currently active:

http://gditestbed.agiv.be/

The "GDI Flanders testbed" is a portal created by the test AGIV with a view to the development of the Geographic Data Infrastructure (GDI) for Flanders. This portal is

aimed at application developers and "Geodata Infrastructure (GI)-experts who wish to learn about and experiment with Web services, geographic services and applications offered by the AGIV. These are:

- access to services and applications in test phase;
- allow developers to experiment with existing and future GDI services;
- GI experts and developers to become familiar with standardized services (W3C, Oasis, ISO TC211, etc.);
- the GI community in Flanders is aware of what standardized web services and geographic services are and what the GDI will provide infrastructure;
- acquainted with the GDI and INSPIRE technology;
- information to the AGIV on user needs (user requirements);
- a technical discussion platform and create a think tank on technical solutions for the GDI;
- provide for interaction between engineers and the AGIV the GI community in Flanders;
- create input for the common GIS Flanders profiles WMS, WFS, WCS, metadata services, etc

The testbed provides an overview of possible solutions to the GDI in the form of projects and services and applications. For each of these projects, the necessary information, tutorials, sample code, web links, etc. are available.

An example of a typical Flemish implementation of the ISO metadata standard (ISO19115) is the GIS Flanders metadata profile. For access to testing services and test applications users have to register (http://login.agiv.be) and then they must send an application for access. The URL to request access can be found on the homepage of each project.

The GDI Flanders testbed provides a number of projects that are ready to be tested:

- The WS-CAPAKEY (CAPAKEY Web service) opens online information from a subset of the entities of CADMAP, including information relating to the administrative municipalities, land divisions, sections and the cadastral land parcel numbers.
- The CRAB is the addresses project of GIS-Flanders.
- The Discovery Service that allows a metadata catalogue to be searched or change. The service is developed as INSPIRE compliant and is based on version 2.0.2 of the OpenGIS Catalogue Services Specification.
- A Web Feature Service (WFS) is an interface for requesting and delivery of geographic vector data. Communication and the delivery of data are executed by means of XML and GML.
- A Web Map Service system (WMS) developed by means of OGC and ISO.

Furthermore, there are also provincial geoportals such as:
http://www.provant.be/bestuur/grondgebied/gis/geoloketten/lijst_geoloketten.jsp
http://www.giswest.be/artman/publish/cat_index_106.html

http://www.gisoost.be

http://gis.limburg.be/

While the http://dov.vlaanderen.be/dov/DOVInternet/default.htm portal provides information about the subsurface of Flanders.

3.6.1 On-line access service for metadata: discovery services

The old SPIDI-application (Spatial Information Directory; Thin client) is closed since January 2008 and was replaced by the new metadata repository (http://metadata.agiv.be).

See sections 3.5.2 and 3.5.4.

Services						
	Service[2]	Organisation responsible	Type of service[3]	Metadata (N/Y/ISO)[4]	Open for Public (Y/N)	Free/Not free[5] (Y/N)
	FLEPOS	AGIV	positioning	N	Y	N
	Metadatabank	AGIV	discover	N	Y	Y
	Geo-Vlaanderen	AGIV	view	N	Y	Y
	GIRAF	AGIV	download	N	Y	Y/N
	CRAB-service	AGIV	cfr. manual in annex	N		
	WMS (testbed)	AGIV	view	N	Y	Y
	WFS (testbed)	AGIV	Download	N	Y	Y
	Discovery service (testbed)	AGIV	Discover	N	Y	Y

[2] List the names/IDs and where possible the link (URL) of all the discover, view, download, transformation and invoking services that are part of your infrastructure
[3] Indicate the type (discover, view, download, transformation and invoking services)
[4] Indicate whether the service has no metadata (N), or metadata according to ISO 19119 (ISO).
[5] Whether or not the service is free for use.

3.6.2 Access service to the data: download services

An access service is available: the GIRAF (http://giraf.agiv.be/giraf.dll/)-application (Geographic Information Retrieval Application for Flanders). It provides information on price, transfer medium and restrictions for use and an order form for a significant part of the reference and core thematic data. Part of the geodatasets can be downloaded. In 2011, GIRAF will be replaced by a new, fast and user friendly download application. This application is know in test, and will come in production by the end of 2010, for most Flemish public bodies.

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

The metadata and GIRAF-applications are not interlinked. Part of the information offered by both applications is however common to both.

3.6.4 Availability of web mapping service(s): view services and Map server interface

A web mapping application (display and query of information presented on maps) is available: the GEO-Vlaanderen application. Currently information is available on 33 items organized in 9 themes (available at http://www.agiv.be/gis/diensten/geo-vlaanderen/). Several other WMS are available in the GDI testbed http://gditestbed.agiv.be.

3.6.5 Availability of catalogue services to regulate access

The GIRAF-application (see 3.6.2) differentiates access to geodatasets.

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

A user's web site can link up to the address finding service of GDI-Vlaanderen.

3.6.7 SDI user applications

No user applications are directly dependent on the RSDI-databases. Multiple applications however make use of RSDI-data after integration in the corporate databases.

3.7 Component 6: Thematic environmental data

3.7.1 Application of the legal framework and funding principles (for reference & core thematic data) to thematic environmental data

The Flemish environmental agencies are members of the partnership GDI-Vlaanderen which means that the provisions the SDI makes for general purpose spatial data also pertain to environmental data. Via the Geo-Vlaanderen application (http://www.agiv.be/gis/diensten/geo-vlaanderen/?catid=76) users can access 11 themes of environmental data such as: Natura 2000, Soil maps, Ecosystem Vulnerability maps, Flood maps, Bird Atlas, etc.

3.7.2 Application of reference data & core thematic data characteristics to thematic environmental data

No information has been found nor provided.

3.7.3 Application of metadata issues identified for reference data and core thematic data to thematic environmental data

Apart from corporate metadata systems, the SDI-metadatabase and the http://metadata.agiv.be/ access application is also in use for explicitly spatial thematic environmental data.

3.7.4 Application of access services issues identified for reference data and core thematic data to thematic environmental data

Some core thematic datasets can be accessed by the GIRAF-application. Some of them are merely described in the metadatabase. Many of them however remain undiscoverable and inaccessible for non-insiders.

3.7.5 Application of standards issues identified for reference data and core thematic data to thematic environmental data

No information has been found.

3.7.6 Application of update procedures issues identified for reference data and core thematic data to thematic environmental data

No systematic update procedures are documented for thematic environmental data.

3.8 Standards

AGIV is considering ISO and OGC standards in their applications. AGIV implemented metadata for feature catalogues using the ISO standard 19110 as well.

3.9 Use and efficiency of SDI

Since its start in 1995, the presence and activities of GDI-Vlaanderen are increasingly influencing the GI- and SDI-scene in Flanders. The effects are clearly beneficial for the larger GI-society. Together with the recent legal framework, the reputation of GDI-Vlaanderen, makes it a most pertinent coordinating initiative with respect to GI.

Examples of the positive impact of the use of (parts of) the infrastructure and use of the infrastructure to support environmental practices:

- The integration of the various types of water related measurements along the hydrographical network (water flow rates, surface water quality, waterbed soil quality, and spotted fish species) into a single application facilitated systematically the work of civil servants dealing with nature conservation planning.
- The integration of some major types of rights of pre-emption (nature conservation, re-allotments, social housing) into a single application, makes it way more easy for both notary practices and public authorities dealing with real estate selling to identify potential rights of pre-emption on specific cadastral parcels, including the ones aiming at extension of nature conservation areas or landscape protection areas.
- The KLIP application (Cables and Pipes Information Portal) enables all utility companies and constructors to identify those amongst them that have (underground) cables or pipes situated in an area where the requesting company intends to start some works. Automatic forms are generated which can be sent to the other companies active in the same area in order to check whether or not economy of scale can be reached by profiting from the fact that a certain road segment will be opened. The other purpose is to avoid damage to others' cables and pipes by requesting detailed plans of each ones facilities based on the automated request forms.
- Spatialist.be is conducting a study among Flanders on analysing the use and impact of GI standards in business processes. Is a 4 year project researching on the technological, legal, economic, sociological and public administrative requirements to further develop an operational Flemish Spatial Data Infrastructure consistent with international standards that is efficient, effective, flexible and feasible.

4 Details of SDI #3: INFRASIG en Région Wallonne

4.1 General Information

Address : Ministère de la Région Wallonne (MRW) – Direction Générale des Pouvoirs Locaux (DGPL) – Direction du Contrôle et des Etudes (DCE), Rue Van Opré 91, 5100 Jambes; Tel: +32-81-32-37-23; Fax: +32-81-32-37-62.

The 'Future Policy for Wallonia' ('Contrat d'Avenir pour la Wallonie'), a report on the Regional Policy Declaration of the Walloon Government, laid down that the Government intends to put the whole of the spatial data on line for all the actors in Wallonia. In the mean time, this ambitious goal has been pursued by joining many different spatial data projects in an open, consistent and co-ordinated system that allows information exchange and avoids duplication and incompatibility.

4.2 Component 1: Coordination and organizational issues

The 'Comité Technique de Cartographie (CTC)', a co-ordinating committee, which was set up by a decision of the regional government on 26 may 2000 played and plays an important role. It is composed of representatives of the government and of actors from administrations in the field of GI. Four main missions have been defined:

- Inventory of the existing spatial data and projects in each administrative department;
- Definition of the future needs in spatial data in each administrative department to coordinate the data production, to avoid duplication of data and to facilitate their exchange;
- Taking stock of the policy and legislation on access to public sector spatial data in relation with the ' Future Policy for Wallonia';
- Management of collaborations and cooperation agreements with other national and regional institutions (NGI, AKRED, GIS-Vlaanderen and CIBG) and participation in European projects.

The CTC discusses on the opportunity to create a Support Centre similar to OC GIS-Vlaanderen. Its main objective would be to support the CTC works and to elaborate and maintain the Walloon RSDI.

In February 2002, the Technical Cartography Committee initiated the INFRASIG project to implement a rational and effective policy on geomatics which integrates the numerical cartography, the GIS and the aerospace imagery. The implementation in a Walloon RSDI takes into account four aspects: organizational, technical, legal and pricing. It includes priority missions such as the design and installation of a unique geo-portal (http://cartographie.wallonie.be) allowing the access to the whole spatial data and metadata. This project is part of the Walloon e-government policy.

Each administrative department active in the field of GI also develops some initiatives that will be linked in the RSDI. For example, the 'Projet Informatique de Cartographie Continue' (PICC) is a major regional initiative to produce a very large scale (1:1.000) reference database. This three-dimensional feature database is the topographic component of the Walloon Reference Data. The history of PICC goes back to May 1991 when the Walloon government charged the Direction de la Topographie et de la Cartographie of the MET (Ministère de l'Equipement et des Transports) to produce the basic layer of the future geographic infrastructure in Wallonia. As a result, the PICC project was initiated which was to produce this three-dimensional reference layer for a future geographic infrastructure in the Walloon Region at a scale of 1:1.000. The PICC is now one of the core elements of the emerging geographic information infrastructure in Wallonia. The Walloon Region remains the owner of these framework plans. There is a portal that can be accessed via http://cartographie.wallonie.be/NewPortailCarto/index.jsp?page=ProfPICC that presents the evolution and the status of the project indicating completed parcels, themes, metadata etc). PICC is collaborating with NGI to establish the complete cartography of the remaining territory.

A number of several other projects are currently running such as the PCNSW (digital mapping of soil in Wallonia), PICVerts (plans of communal green routes) etc (http://cartographie.wallonie.be/NewPortailCarto/index.jsp?page=GenProjets).

4.3 Component 2: Legal framework and funding

4.3.1 Legal framework

Currently, there is no legal framework for the Walloon SDI. The INFRASIG-initiative is essentially project-oriented. The main objectives of the project are:

- Making easier the access to spatial data for everybody through consistent and transparent pricing and distribution policies in a definite legal framework;
- Assuring the quality of spatial data services;
- Guaranteeing the setting of standards for the data documentation and exchange;
- Enhancing user awareness and education.

The Walloon government is currently working on a Geomatics decree which will transpose the INSPIRE directive, and enlarge the composition of the CTC with other regional authorities, provinces, local authorities, public utility companies, the private sector, universities etc. (see J.P Kinnaert, Walloon Region's SDI and Geoportal - State of progress, http://ies.jrc.ec.europa.eu/uploads/SDI/Wallonia%20%20KINNAERT.pdf).

4.3.2 Public-private partnerships (PPPs)

There are no true PPPs in the Walloon Region. Discussions have been held with utility providers to share underground spatial data sets (see J.P Kinnaert, Walloon Region's SDI and Geoportal - State of progress, http://ies.jrc.ec.europa.eu/uploads/SDI/Wallonia%20%20KINNAERT.pdf)

4.3.3 Policy and legislation on access to public sector information (PSI)

See 1.3.1

4.3.4 Legal protection of GI by intellectual property rights

See 1.3.2

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

See 1.3.3

4.3.6 Licensing framework

Data and services can be accessed via the geoportal (http://cartographie.wallonie.be). They can be viewed on-line, downloaded on-line or on CD-ROM. There are four types of use: use in course of a public task, use by contractors in the course of a publicly procured activity, educational use, and any other type of use (commercial or professional use). Standard licences are foreseen for use by public services, but for other applications, no standard licences have been developed yet, and availability of data will have to be agreed upon by the parties in each case.

4.3.7 Funding model for SDI and pricing policy

The Working Group on Pricing Policy of the INFRASIG project has proposed recommendations to the Walloon government, which have been included in the licenses that are available on the website. Public services can obtain the data for free or for a sum determined in agreement between the parties, while for the organizations that are subsidized by a government institution, the same conditions apply as for that particular institution. For any other applicant, pricing will be determined by mutual agreement.

4.4 Component 3: Data for themes of the INSPIRE annexes

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

The current spatial datasets support different scale levels, from the 'national', 'Regional" and 'Local' scales to the very larger scale (1:1.000 supported by PICC).

Regarding the three INSPIRE annexes addressing the 34 spatial data themes. The Walloon region is providing discovery and view services for some of them complete with metadata while a number of them can be also downloaded.

A complete list will be presented in the updated report including the information provided in 2010.

4.4.2 Geodetic reference systems and projections

See 1.3.4

4.4.3 Quality of the data

Quality is based on resolution and scales of publication or data sources. It is not explicitly based on user's perspectives:

- There is no standardized, systematic quality control process for attributes of objects. But specific quality and certification tests and procedures (no complete conformance to ISO 19113 and 19114) have been detailed in the project specifications for the elaboration of some data (PICC, environmental data, land planning data…). Quality assessment is available for all reference datasets, but not for all core thematic datasets;
- The metadata catalogue has provision to include the quality assessment and description:
  - Completeness (errors of (c)omission) of spatial objects or attributes;
  - Logical consistency (conceptual, domain and topological consistency);
  - Positional accuracy and precision (absolute and relative).
- Quality advice is limited to metadata and non standardized documentation;
- The update schedule depends upon the geodatasets and is not systematic;
- Changes are managed by time series of snapshot datasets; previous versions of geodatasets and their metadata remain available;
- Accessing change-only information is not provided for;
- No portrayal standard for symbolizing geographic information is in use.

4.4.4 Interoperability

- The two GIS-software used in the Walloon regional administrative departments are from the ESRI-family and the STAR-family. Administrative departments distribute geodatasets in ESRI-formats and partially in STAR formats.
- Other software-related formats (Geomedia, Microstation (*.DGN), DXF, MapInfo (*.MAP) and Autocad (*.DWG) are also available for the PICC.
- Software-related data converters are available.
- Raster imagery is distributed in geoTIFF and JPG formats mainly.

A modelling approach, based on the INTERLIS methodology, was implemented for the reference data. Three models have been established: a topographic reference data model, a PICC model and a surveyor data model. For thematic data, an UML modelling approach was implemented.

The INTERLIS model provides:

- Sequential-incremental update,
- Polymorphism, Inheritance,
- Quality and integrity controls,
- Interoperability potential,

The data modelling constitutes one of the preparatory steps to the second phase of the InfraSIG project, with the intention of exchanging the spatial data with the other GI actors in the public and private sectors (Kinnaerts, 2008).

4.4.5 Language and culture

Metadata are provided. The original language is French. A tool called MUGIRE (Multilingual GI Retrieval Engine) allows the translation in English and German (shortly in Dutch).

- SDI accompanying documents are available in French only;
- A feature catalogue (data dictionary) is not available;
- A consolidated, standardized glossary of terms was made available.

4.4.6 Data Content

There is text explanation for attributes in the metadata.

4.4.7 Geographical names

Geographical names are managed in the French language.

Neither primary, nor secondary name sets are used.

4.4.8 Character sets

No information has been found nor provided.

4.5 Component 3: Metadata

4.5.1 Availability of metadata

Metadata are available for all the reference and core thematic geodatasets.

Completeness of the metadata is satisfactory for a significant part of the data.

Metadata allow the user to assess fitness for use.

4.5.2 Metadata catalogues availability + standard

Under the project INFRASIG , a working group "metadata" has been created to determine the metadata to be associated with existing geographic datasets. Metadata is now described in the standard **ISO 19115.** The standard is published in English and contains more than 400 fields. The selected fields contain at least the mandatory fields of ISO 19115. The dictionary of metadata created is commonly called **"profile Walloon"** and is physically stored as a database called **"METAWAL (**http://cartographie.wallonie.be/NewPortailCarto/index.jsp?page=ProfCatalogueGeneseMeta&node=31**).**

The metadata can be generated in XML format in accordance with ISO 19139 (v6) standards, so they can be interchanged with partners outside the Walloon Region.

4.5.3 Dublin core metadata standards for GI-discovery

The Dublin Core metadata standard was taken into account when designing the Walloon ISO 19115 metadata profile (Kinnaert and Leruth, 2003).

4.5.4 Metadata implementation

Responsibility for creation, supply and maintenance of metadata lies with the data producers.

There is no standardized feature code-list within the metadata, or a standardized thesaurus.

Update of metadata is on a voluntary basis by the data producers. Discipline for update is generally low.

The Walloon region has designed a metadata management system (METAWAL) that will be adapted after the INSPIRE discovery service implementing rules enter into force (Kinnaert, 2008).

METAWAL comprises of:

- Data dictionary of the Walloon profile compliant with the ISO 19115 and 19119 standards
- UML models of the ISO and Walloon metadata profile
- Models implementation in an Oracle DB (or MySQL DB)
- User-friendly coding interfaces
- Multi-criterion search and retrieval information interfaces
- Discovery and exploitation metadata
- XML import/export tools in accordance with pre-ISO 19139 V6

4.6 Component 5: Network Services

Baseline data are available to all professional users in **WMS**

List of WMS of the Walloon Region:

- **PICC:** http://cartopro2.wallonie.be/wmspicc/wms110.do?REQUEST=GetCapabilities&VERSION=1.1.0.
- **PPNC:** http://cartopro1.wallonie.be/WMS/com.esri.wms.Esrimap/PPNC?version1.1.1
- **MNT Lits majeurs:** http://cartopro1.wallonie.be/WMS/com.esri.wms.Esrimap/grid_only?version1.1.1.
- **Patrimoine naturel:** http://cartopro2.wallonie.be/wmsdnf/wms110.do?REQUEST=GetCapabilities&VERSION=1.1.0.
- **Orthoimage QuickBird de l'agglomération de Liège:** http://cartopro1.wallonie.be/WMS/com.esri.wms.Esrimap/quickbird_Liege?version1.1.1.
- **Données de référence du Viewer ESRI:** http://cartopro1.wallonie.be/WMS/com.esri.wms.Esrimap/portail?version1.1.1 or http://cartopro1.wallonie.be/WMS/com.esri.wms.Esrimap/portail_grid?version1.1.1

WMS clients are available free to the following Internet addresses:

- Ionic Geoviewer : http://dev.ionicsoft.com:8080/ionicwrsclient230/geoviewer/index.jsp
- Intergraph OGC WMS Viewer : http://www.wmsviewer.com/main.asp
- OpenJUMP : http://openjump.org/
- Gaia: http://www.thecarbonproject.com/gaia.php

4.6.1 On-line access service for metadata: discovery services

An ISO 19115 compliant metadata catalogue is available at http://carto5.wallonie.be/MetaWal/Search/search.php?type=admin describing all the spatial data and associated data available in the Walloon administrative departments.

Via the portal access to numerous data themes is available such as:

Agriculture, Buildings, Biodiversity, Base Mapping and Imaging etc (full list of catalogue data, Services and applications available at:

http://cartographie.wallonie.be/NewPortailCarto/index.jsp?page=ProfCatalogue&node=31

Moreover the Data Online section provides data divided to Baseline and Thematic. These include:

- Access to baseline (CCIP, PPNC, …)
- Agriculture and Rural Affairs
- Land Use and Planning
- Environment and Natural Resources
- Heritage
- Local data
- Tourism
- Transport and Mobility

4.6.2 On-line access service for data: download services

A reference data display and download service is available at http://cartographie.wallonie.be/NewPortailCarto/index.jsp?page=ProfDonnRef&node=32 : large scale topographic data (PICC), orthophotographs, Digital Terrain model (DTM) of the principal water courses and Navtech street atlas) are available to selected users (Regional and Local authorities). The link contains baseline and thematic data.

Environmental data display services are also available in Intranet to Regional authorities: all environmental data are available. Geological data service (http://environnement.wallonie.be/cartosig/cartegeologique/), protected natural sites data service (http://environnement.wallonie.be/cartodnf) and water data service (hydrographical network, river basins, water sources and restricted areas, sewage) (http://carto.spge.be/) are available to all users (public and private sector, citizens).

A regional motorways and roads network data service is also available to all users: http://routes.wallonie.be/struct.jsp?chap=3&page=2.

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

The future applications will be interlinked.

4.6.4 OpenSource software and access services

The reference data service is compliant to WMS standard (ISO 19128 et OGC WMS 1.1.1).

An ISO 19119 and OGC CAT 2.0 compliant metadata catalogue services will be implemented.

4.6.5 Availability of web mapping service(s): view services

A list of spatial data themes can be viewed at http://cartographie.wallonie.be/NewPortailCarto/index.jsp?page=CitCartesDynAutrApplic&node=10.

4.6.6 Availability of catalogue services that perform payment operations

Price information is available but no related catalogue services.

4.6.7 SDI user applications

No user applications currently directly depend on the SDI-databases.

4.6.8 Availability of geo-processing services

Not available

4.7 Component 6: Thematic environmental data

Official address:

Ministère de la Région Wallonne – Direction Générale des Ressources Naturelles et de l'Environnement (DGRNE) – Direction de la Coordination Informatique ; Avenue Prince de Liège 15, 5100 Jambes ; TEL : 081/33.60.08 ; FAX : 081/33.60.22.

Ministère de la Région Wallonne – Direction Générale de l'Aménagement du Territoire, du Logement et du Patrimoine (DGATLP) – Direction de l'Observaoire de l'Habitat et de la Géomatique, Rue des Brigades d'Irlande 1, 5100 Jambes ; TEL. : 081/33.21.17; FAX : 081/33.24.42.

Thematic environmental data are covered by the INFRASIG-project. So the general provisions of the emerging RSDI apply to thematic environmental data.

http://environnement.wallonie.be/cgi/dgrne/plateforme_dgrne/visiteur/

Thematic environmental data covered by the RSDI include

- Soils and subsoil,
- Geology,
- Government service and environmental monitoring facilities (sewage, waste and energy facilities, production sites…),
- Production and industrial facilities (abstraction and mining sites),
- Area management/restriction/regulation zones & reporting units (restricted areas around drinking water sources, nitrate-vulnerable zones, prospecting and mining permit areas, river basin districts, water resources,
- Monitoring sites,

- Sector management & reporting units,
- Habitats and biotopes,
- Natural risk vulnerability zones,
- Technological risk vulnerability zones,
- Local contaminated areas,
- Green urban areas,
- Cultural heritage,
- Natural amenities.

A number of core thematic geodatasets are held separately by DGRNE-GIS.

4.8 Standards

CTC is considering ISO and OGC standards in their applications. An ISO 19115 compliant metadata catalogue is available while the reference data service is compliant to WMS standard (ISO 19128 and OGC WMS 1.1.1).

4.9 Use and efficiency of SDI

The GeoPortal of Walloon RSDI has been developed according to the perspectives and timing put forward in 2003. It provides access in a standardized way to a multitude of spatial datasets. It would be interesting to monitor the intensity of use made of this modern resource.

The geo-portal of the Walloon Region (http://cartographie.wallonie.be/NewPortailCarto/) is targeting the citizen as well as private companies. Citizens can use the information to get administrative or other information: transport, school works, …, as well as static thematic maps and information. Private companies can be notaries, architects, companies who want to tender, researchers, etc. The infrastructure is used intensively to support environmental policies

(see also
http://cartographie.wallonie.be/MetaWalSearch/export.jsp?format=html&validation=yes&mdFileId=ADMSDE.CONSNAT&kindMeta=discover).

Monthly statistics of the Geoportal: from 2004 to 2008:

- Visits : 10.000 to 20.000
- Volume of download files : 5 Mb to 5 Gb
- From less than 100 in 2004 to 650 users of local authorities (provinces, 137 communes (52%), police services, fire brigades, utility facilities services…) authenticated by the UM/AM to access secured viewers and download facilities.

5 Details of SDI #4: FPGI

5.1 General Information

Name: Federal Platform for Geographic Information

Official Address:	
Nationaal Geografisch Instituut Abdij ter Kameren, 13 B-1000 Brussel Tel: +32 2 629.82.11 Fax: +32 2 629.82.12	Institut Géographique National Abbaye de la Cambre, 13 B-1000 Bruxelles
Overall contact person:	
Ir. Ingrid Vanden Berghe Address: idem Email: ivb@ngi.be	
Official Address:	
Federale Overheidsdienst FINANCIEN Algemene Administratie van de Patrimoniumdocumentatie (AAPD) North Galaxy – Toren B / 8° verdieping Koning Albert II-laan, 33 bus 50 B-1030 Brussel Tel: +32 257 635 98 Fax: +32 257 617 52	Service Public Fédéral FINANCES Administration Générale de la Documentation Patrimoniale (AGDP) North Galaxy – Tour B / 8ème étage Boulevard du Roi Albert II, 33 – boîte 50 B-1030 Bruxelles Tel: +32 257 628 53 Fax: +32 257 617 52
Overall contact person:	
Mr. Daniel De Brone Administrateur-generaal /Administrateur général Address: idem Email: daniel.debrone@minfin.fed.be	

In 2004, the Federal Platform for Geo-information (FPGI) was established by NGI / IGN (National Mapping Agency) and GAPD / AAPD / AGDP. The aim of the FPGI was to set-up an optimal SDI and to put Geographic Information at the disposal of the users in a convenient way.

The FPGI focuses on following objectives: (1) to gather the various federal services that produce, use or manage geographical data; (2) to harmonize the different federal geographical datasets and (3) to support the access to the federal geographical datasets. The platform currently includes two members (NGI, GAPD). Its ambition, in the near future, is to gather the other Belgian federal institutions that are concerned by

geographical, statistical and patrimonial information. In the medium term, the platform will be able and is willing to provide the information required by INSPIRE annexes 1 and 2.

The Nationaal Geografisch Instituut (NGI), a federal institute under the Ministry of Defence. It is Belgium's national institution for cartography and geographic information. It was set up by the Belgian Federal Government in 1976. It was created by national law of 8 June 1976 as a semi-public organization under the control of the Minister of Defence At the federal level a discussion is underway regarding the development of an NSDI for "Belgian Territory." Its implementation depends on the decisions of public authorities.

Tasks of NGI include:

- Development and maintenance of the national geodetic networks (planimetry and altimetry); constituting the national reference frame of geographic and cartographic coordinates
- Production and update of the aerial and satellite photo coverage of the country;
- Production and update of the topographic databases of the country;
- Publication of national map series and GIS information;
- Co-ordination of GIS applications;
- Special works on behalf of third persons;
- Compilation of documentation about its specific activities.

The General Administration of Patrimonial Documentation (GAPD) is the second pillar of the Federal Public Service Finance. The FPS Finance is composed of 3 General Administrations: “Taxes & Recovery”, “Patrimonial Documentation” and “Treasury”. The General Administration of Patrimonial Documentation is structured around five pillars (operational departments): Legal Security, Surveys & valuations, Patrimonial Departments, Non fiscal recovery, Collection and exchange of information. The General Administration of Patrimonial Documentation (GAPD) has consequently classical missions: cadastral mission, registration mission, mission of Patrimonial Departments, mission of non fiscal recovery, mission of legal security, etc. But GAPD has also general missions which are: building-up patrimonial documentation, diffuse patrimonial documentation and delivering services related to the patrimonial documentation.

Today, cadastral extracts are the GAPD’s main products. The objective of the project STIPAD (System of Integrated Treatment of Patrimonial Documentation) is to reorganize in a rational and efficient way the business of GAPD. This will be done by digitizing alphanumeric and graphic data (cadastral map), and by adapting the work process with a central database on patrimonial data (PATRIS) using the last technological progress. In collaboration with the Regions, the notaries, the bailiffs, the objective is to provide to the potential users, public as well as private, the movable and real estate data concerning composition and value of the patrimony for all natural or legal persons according to agreed authorizations in accordance with the law on privacy. Information on STIPAD is available on: http://fiscus.fgov.be/interfakredfr/stipad_fr/contextegeneral_fr.htm. GAPD

is also a member of EuroGeographics and is as such a data provider in the pan-European project EuroBoundaries.

Recently the Federal Platform for Geo-information has been established, with – besides NGI - as most important partners AAPD / AGDP (Administration of Cadastre) and NIS / INS (National Institute for Statistics). The aim is that the Federal Government will be able to set up an optimal SDI and to put the GI at the disposal of the users in a convenient way.

NGI and AAPD/AGDP have already signed cooperation agreements with several other federal governments and the 4 Regions. Also for several projects agreements were made with the Regions. Nevertheless, a real coordinated and integrated approach of the federal and regional levels does not yet exist in Belgium.

5.1.1 Conclusions of Component 1

The approach and territorial coverage of the SDI is truly national and a number of the SDI components have reached a significant level of operationality. There is now a clear initiative at the national level including a National Contact Point, a coordinating structure (INSPIRE Coordinating Committee) in which both federal and regional level is represented, and there exists a forum for stakeholder involvement. Both producers and users are participating, although the end users (consumers of geo-data) are less involved. User associations are indirectly involved (e.g. seminars). It should be mentioned that before it was at the federal level a joint initiative of IGN and Cadastre, with the evolvement of INSPIRE it is clearly a joint coordination in which both organisation of type NMA and 'users' (Ministries of Environment) are represented and play an active role. The associations are not directly involved in the coordination. Although the group of participants are extended with the implementation of INSPIRE (e.g. GDI decree Flanders), the main focus remains the public sector

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 (Not so clear)
- 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

5.2 Component 2: Legal framework and funding

5.2.1 Legal framework

Currently, there is no encompassing legislation for the SDI at the federal level. Relevant legal instruments include:

- Law of 8 June 1976 establishing the NGI;
- Royal Decree of 19 March 1996 determining the fees and rules for extracts of cadastral information, amended in 2001;
- Cooperation agreement between NGI and GAPD establishing the Federal Platform for Geo-Information.

The federal level is currently working on the transposition of the INSPIRE directive. This will be done in a new law, which is currently being discussed among the ministries.

5.2.2 Public-Private partnerships (PPPs)

The NGI has agreements with a number of private companies as resellers, Value Added Resellers and partners for the development and distribution of products for the general public.

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

See 1.3.1.

5.2.4 Legal protection of GI by intellectual property rights

See 1.3.2.

5.2.5 Restricted access to GI further to legal protection of privacy

See 1.3.3

5.2.6 Licensing framework

NGI makes a number of on-line resources available free of charge for internal, personal or non-commercial use, such as administrative maps or transport networks. Next, topographic maps can be selected on different scales and for a particular area, which can

be ordered online. A list of prices is available and standard conditions are listed on the website.

The topographic vector and raster database, orthophotography, and the DTM are available for internal use, publication on paper, digital publication in a derived product, publication on the Internet, educational use and scientific use under standardised pricing schedules. Two types of licences exist: a use licence for any internal use, for a lump sum fee, and an exploitation licence for Value Added Resellers, who make added value products on the basis of NGI-products.

GAPD is currently working on a licensing framework.

5.2.7 Funding model for SDI and pricing policy

The funding model for the NGI is a combined one, which is composed of subsidies and own revenues.

The major source of income is the contribution of the federal government (Ministry of Defence) in order to secure an important part of the standard GI production. In addition, NGI has to generate a substantial part of its financial resource itself by the distribution of the different NGI products and services.

In 2008, NGI revised its pricing policy. Internal use is charged under standard fees, while value-added reselling is charged on the basis of a number of variables, such as the part of NGI data in the final product, sales figures, the price of the value added product, etc. The starting point for the charges is the size/amount of data that is requested, with a digressive tariff.

Payment can be done via annual contributions or a one-off fee. Considerable discounts are offered to public bodies, non-profit organizations, universities and scientific institutions, and students.

Besides direct sale by the commercial services of the NGI the products are also distributed by means of resellers (partners) which receive a commission for their role as a sales agent. NGI carry out also special tasks for third parties. The costs for such work are entirely charged to the customer according to the prices stipulated by the analytical accountancy. These prices corresponds to the real cost of the employees (with overhead) and the depreciation of the used production resources.

The GAPD is part of the Federal Public Service Finance of the Belgian federal government and is financed mostly by means of state funding and revenues from the provision of cadastral abstracts.

The issuing of cadastral extracts and information and the remunerations are fixed in an “arrêté royal” approved by the minister competent for the budget and the inspector of finances.

5.2.8 Conclusions of Component 2

Currently, there is no encompassing legislation for the SDI at the federal level .There are strategic documents and a decree at the Flemish level, but not (yet) at the federal level. This is being prepared but is not ready yet. There is now a budget for the coordination of INSPIRE, but it is not clear how much and seems not to cover additional activities related to the SDI. There is a pricing policy for individual organisations (e.g. IGN) but not an overall pricing framework. With the advent of INSPIRE, there is a clearer pricing policy (e.g. for URBIS providing certain data for free).

Based on these conclusions we score the indicators as follows:

- There is a legal instrument or framework determining the SDI-strategy or –development (In Preparation)
- There are true PPP's or other co-financing mechanisms between public and private sector bodies with respect to the development and operation of the SDI-related projects (No)
- There is a freedom of information (FOI) act which contains specific FOI legislation for the GI-sector (In Preparation)
- GI can specifically be protected by copyright
- Privacy laws are actively being taken into account by the holders of GI (Not so clear)
- There is a framework or policy for sharing GI between public institutions (In Preparation)
- There are simplified and standardised licences for personal use (In Preparation)
- The long-term financial security of the SDI-initiative is secured (No)
- There is a pricing framework for trading, using and/or commercialising GI (In Preparation)

5.3 Component 3: Data for themes of the INSPIRE annexes

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

European scale

NGI is a member of EurogeoGraphics and is participating in 3 major projects. GAPD is also member of EuroGeographics and is participating in 1 major project.

The 4 databases in which NGI data is incorporated are:

- SABE: EuroBoundaryMap; the Seamless Administrative Boundaries of Europe;
- EGM: EuroGlobalMap; the 1:1 000 000 GI dataset of Europe;
- ERM: EuroRegionalMap; the 1:250 000 GI dataset of Europe. NGI is the Project Coordinator for the development and maintenance of this product.
- EGN: EuroGeoNames combines Geographic Names from the National Mapping and Cadastral Agencies across Europe to create a unique service and data set. The NGI provides the geographical names for Belgium in the project.

A part of GAPD data is incorporated in the State Boundaries of Europe (SBE) database.

National scale

Different conceptual scale levels of datasets are supported by NGI Belgium:

- 1:10 000: 3D-line CAD files, Top10v-GIS database, DTM 1:10 000, Admin-v
- 1:50 000: Top50v-GIS database, DTED (DTM)
- 1:100 000: European dataset “CORINE Land Cover” for Belgium
- 1:250 000: Top250v-GIS database
- 1:300 000: Admin-v-gen

The available products can be found at: http://www.ngi.be/NL/NL1.shtm

Different conceptual scale levels of datasets are supported by GAPD:

- 1:500 – 1:10 000: digital cadastral maps (CadMap);
- Border stones of Belgium (country).

5.3.2 Data by resolution or scale range for the INSPIRE themes

Regarding the three INSPIRE annexes addressing the 34 spatial data themes, NGI and cadastre (AGDP) is providing discovery and view services for most 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.

Description of the products

A. Vector data

NGI and GAPD produce vector data in CAD or in GIS environment and in different scales.

The 3D line dataset is a CAD product. In the 3D line dataset (1:10 000 scale), points and lines are saved in thematic layers (x, y, z coordinates).

The "Top" (for topographic) databases are GIS oriented. They make use of points, lines and polygons (x, y coordinates) which are related to "codes". These codes are in fact objects, described in a data dictionary. These objects are extended with attributes which describe the object in detail.

Products of NGI

3D-line

Conceptual scale: 1:10 000
Formats: dgn, dxf, dwg
Availability: 85% of the territory (March 2005)

The geometry of the 1:10 000 data is captured by photogrammetry on aerial photos.

This initial "CAD" dataset after restitution is also based on field survey. It is made in Microstation (dgn) and uses beside the x and y coordinates also z values.

The data have no object-attribute structure and are saved in about 40 thematic layers. As it is an initial dataset, not all the information that NGI collects is used in this product.

Top10v-GIS

Conceptual scale: 1:10 000
Formats: native ESRI formats, other formats available via FME
Availability: 75% of the territory (March 2005)

The geometry is captured by photogrammetry on aerial photos.

Top10v-GIS is a thematically and topological structured 2D database. Field survey is the base for the structuring of the data in 15 coverage's with information about administrative borders, electricity, hydrography, railways, roads, constructions and land use.

This database is a rich and correct source of information for local and regional applications.

Top10v-GIS and Top50v-GIS have the same structure of data.

Full description,

in French :
http://www.ign.be/Common/articles/CA_Top10V-GIS_TOP50V-GIS/restruct_doc.htm#top

in Dutch :
http://www.ign.be/Common/articles/CA_Top10V-GIS_TOP50V-GIS/restruct_doc_nl.htm#top

Top50v-GIS

Conceptual scale: 1:50 000
Formats: native ESRI formats, other formats available via FME
Availability: whole territory

Top50v-GIS is a thematically and topological structured 2D database. This GIS is derived by generalization from Top10v-GIS and updated by field survey.

This database is good source of information for regional applications.

Top10v-GIS and Top50v-GIS have the same structure of data.

Full description,

in French :
http://www.ign.be/Common/articles/CA_Top10V-GIS_TOP50V-GIS/restruct_doc.htm#top

in Dutch :
http://www.ign.be/Common/articles/CA_Top10V-GIS_TOP50V-GIS/restruct_doc_nl.htm#top

Top250v-GIS

Conceptual scale: 1:250 000
Formats: native ESRI formats, other formats available via FME
Availability: whole territory

Top250v-GIS is a thematically and topological structured 2D database. The geometry is principally obtained by generalization of Top50v-GIS. Different sources of information are used to update the dataset every year.

This database is ideal for national and even for European application. And is the data source to produce the Belgian component of EuroRegionalMap.

Full description,

in French :
http://www.ign.be/Common/articles/CA250/definitiondata30600.pdf

in Dutch :
http://www.ign.be/Common/articles/CA250/definitiondataNL.pdf

Corine Land Cover dataset

Conceptual scale: 1:100 000
Formats: native ESRI formats, other formats available via FME
Availability: whole territory

The objective of the pan-European project CORINE (COR = Coordination, IN = Information, E = Environment) is the provision of a unique and comparable data set of land cover for Europe using 44 classes of land use. The Belgian part of Corine is realized by NGI. The classification was done on high resolution Landsat satellite images. Different sources (orthophotos and the different maps and databases of NGI) were also used for the identification.

Administrative borders of Belgium (Admin-v)

Conceptual scale: 1:10 000
Formats: native ESRI formats, other formats available via FME
Availability: whole territory

This database contains the administrative borders of Belgium (country, regions, provinces, arrondissement and communities) and the names of the communities.

This product is derived from the 1:10 000 dataset.

There exists also a generalized version (conceptual scale: 1:300 000): Admin-v-gen.

Products of GAPD

CadMap-shp

Conceptual scale: 1:500 – 1:10 000
Formats: shp (other ESRI formats available on demand)
Availability: whole territory

This initial "CAD" dataset is based on field survey, photogrammetry on aerial photos and sketch mutations. It is made in ArcGIS (shape) and uses x and y coordinates. The data have an object-attribute structure and are saved in 13 thematic layers (information about parcels, buildings, hydrography, railways, roads, border stones, …). As it is an initial dataset, not all the information that GAPD collects is used in this product.

CadMap-dwg

Conceptual scale: 1:500 – 1:10 000
Formats: dwg (other formats available via FME on demand – with reservation)
Availability: whole territory (on demand)

This product is derived from the CadMap-shp product by conversion via FME.

Border stones

Formats: shp
Availability: whole territory (under construction)

This database contains the coordinates of the border stones of Belgium (country) in different reference systems and the names of the points, based on legal definition of boundaries and related in reference documents. This dataset is based on field survey and

calculations. This dataset is produced using all the treaties and warrants concerning the borders of Belgium.

B. DTM

Formats: TTN, GRD, ASCII, DGN,

A great number of users are especially interested in the altimetry of a region.

So, NGI has produced Digital Terrain Models (DTM's) - sometimes called Digital Elevation Models (DEM's) - for a great part of Belgium.

NGI dispose of two DTM's : DTED (DTM on a scale 1:50 000) and the DTM 1:10 000. These DTM's can be delivered in different forms and formats (elevation lines, ASCII lists, etc..).

C. Raster data

Raster maps

Formats: tiff (+ tfw), 381 dpi

NGI produces colour raster maps by symbolization of the different vector databases (Top10v-GIS, Top50v-GIS, Top250v-GIS, Corine Land Cover and Admin-v-gen). After symbolization the contour lines and topology (names) are also integrated in the raster maps.

Products

Top10r raster
Top50r raster
Top250r raster
Corine raster
Administrative borders

Orthophotos

Formats: tiff (+tfw)
Accuracy: < 1m
Pixel: 0,5m x 0,5m
Dimensions: 2km x 2 km
Availability: whole territory

A conventional aerial photograph contains image distortions caused by the tilting of the camera and the usual distortions in a photo. You cannot measure distances on an aerial photograph like you can on a map. The effects of the distortions are removed from the aerial photograph by a mathematical process called rectification to obtain an orthophoto. An orthophoto is a uniform-scale image. It is possible to measure directly on it. In Belgium NGI orthophotos are often used to measure parcels.

Other digital products from NGI

NGI tries to develop "popular" digital product for the common citizen. These products are derived from the more professional top-v or top-r products. The development is done by NGI or by private partners. The goal is to create digital products usable in GPS, PDA, internet or other new and popular multimedia applications.

Samples of such products: CDROM 1:50 000 Wallonië en Brussel/ Vlaanderen en Brussel; Topomap Belgium for Garmin GPS.

A concise description of the NGI products is available at: http://www.ngi.be/NL/NL1.shtm

Other digital products from GAPD

GAPD tries to develop "popular" digital product for the common citizen and the different governments (regions, provinces, municipalities). These products are derived from the CadMap-product. The development is done by GAPD. The goal is to create digital products usable in internet or other (external) applications.

Samples of such products: CDROM Municipality; CDROM Province; CDROM Regions CDROM Officially agreed surveyor, cooperation agreements,….

5.3.3 Geodetic reference systems and projections

The Belgian National Reference System 1972 was developed in the 1970'ies when a need for a precise national coordinate system to be used by the mapping authorities had become essential.

The Belgian National Reference System 1972 is characterized by:

- Ellipsoid: Hayford 1924
- Geodetic Datum: Belgian Datum 1972 (BD72)
- Height reference system: Deuxième Nivellement Général / Tweede Algemene Waterpassing.
- Map projection: Lambert conformal conic projection 1972 (Lb72)

The Belgian Lambert Conformal Conic projection 72- developed on the reference system 1972 - is used for all scale mapping.

Recently the Lambert 2008 system has been introduced (see chapter 1). And a transformation module between Lambert 72 to Lambert 2008 is available at: http://www.ngi.be/NL/NL2-1-9.shtm.

Link between the Belgian National System and the European Reference

The Global Positioning System (GPS) enables precise positioning anywhere on earth with a precision of a few millimetres, if an appropriate reference frame is in place. This

framework in Belgium is known as BEREF (Belgian Reference Frame) and is a precise realization of the European Terrestrial Reference System, ETRS89.

BEREF is characterized by:

- Ellipsoid: Geodetic Reference System 1980 - GRS80
- Geodetic Datum: Belgian Reference frame – BeRef

5.3.4 Quality of the data

IGN

Quality control system

The quality of the IGN data is based on resolution and scales of publication.

IGN is now developing a quality control system according to ISO 19113 and 19138, to have a better view on the quality of the data. Following elements and sub elements are systematically controlled:

- Completeness (omission and commission)
- Logical consistency (domain, format and topological consistency)
- Positional accuracy (absolute accuracy)
- Temporal accuracy
- Thematic accuracy (classification correctness, non-quantitative attribute correctness and quantitative attribute correctness)

The results of these quality controls will be reported in the metadata.

Absolute positional accuracy of the reference data

Measure: CE 90 (ISO 19138: ID 44)

Feature type	*Absolute positional accuracy → XY*	*Absolute positional accuracy → Z*
Road Segments	1,5 m	2 m
Buildings	1,5 m	/
Watercourse Segments	2,5 m	3 m

Accuracy of a cadastral map (GAPD):

GAPD

There is a difference of accuracy between old cadastral maps, analogue re-measured maps and digital maps.

Original cadastral maps: Taking into account the accuracy mistake, the reading mistake and the drawing mistake, the accuracy is:

Scale	Mistake
1/500	$\pm 0{,}90m$
1/1250	$\pm 1{,}89m$
1/2500	$\pm 3{,}53m$
1/5000	$\pm 6{,}81m$

b) Analogue measured maps: These maps are always drawn on scale 1/500 before being transformed.

Scale	Mistake
1/500	$\pm 0{,}90m$
1/1000	$\pm 1{,}01m$
1/2000	$\pm 1{,}28m$
1/5000	$\pm 2{,}35m$

c) Digital maps: We must only take into account the accuracy mistake and thus the result is : mistake = $\pm 0{,}25m$

Attributes are controlled systematically.

Updates:

- Digital maps: updated permanently (sketch mutations), digital maps available on situation 1.1.2xxx
- Border stones: updated permanently (under construction)

5.3.5 Interoperability

NGI

Formats:

The vectorial CAD product 3D line is available in dgn, dxf and dwg formats. The vectorial GIS Top10v-GIS, Top50v-GIS, Top250v-GIS, Corine Land Cover, Admin-v, Admin-v-gen are available in ESRI formats (coverage's, shape).

The raster products are available in Tiff (with tfw) format.

Other software-related formats are available via FME (Safe Software).

Conceptual:

Within the framework of the SGISR project a Glossary of terms, an ISO19115 metadata profile, a O-O Conceptual Data Model (UML) and a ISO19110 Feature Catalogue were created.

GAPD

ESRI's .shp-format is considered the reference exchange-format. The maps are available in ESRI formats and dwg. Other software-related formats are available via FME (Safe Software) on demand. Border stones are available in shape.

5.3.6 Language and culture

Geographical names: Dutch or French
Metadata: Dutch and French
Documents: Dutch and French
Glossary of terms (TOC project): Dutch and French

5.3.7 Data content

Data description exists in French and Dutch and is delivered automatically with the data (see 5.3.2).

5.3.8 Geographical names

Currently, information concerning the geographical names is available, in French and Dutch, in the digital products and on the paper maps.

5.3.9 Conclusions of Component 3

Already from the previous BE's SoP report Geodatasets existed which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components while the geodetic reference system and projection systems are standardised, documented and interconvertable. The INSPIRE 2010 MR confirms the statement. 239 data sets have been reported with 98, 44 and 97 for Annex I, II and III respectively. QC procedures are part of data maintenance of data producers and of the technical centres of the regional SDI. However, this is not done according to specific standards, and the procedures are still more part of the work of the individual data producers. The attention for standardisation and interoperability issues has increased with the development of INSPIRE. Several key players are now active in this field (AGIV, IGN, …) mainly through European projects. Attention is going clearly beyond data exchange formats (e.g. also data specs developments). French and Netherlands are the two languages for the regional and national SDI.

Based on these conclusions we score the indicators as follows:

- Geodatasets exist which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components

- The geodetic reference system and projection systems are standardised, documented and interconvertable

- There is a documented data quality control procedure applied at the level of the SDI (Partially)
- Concern for interoperability goes beyond conversion between different data formats
- The national language is the operational language of the SDI
- English is used as secondary language (No)

5.4 Component 4: Metadata

5.4.1 Availability of metadata

IGN

An on-line metadata catalogue for the IGN products is available on the website http://mercator.belgie.be/explorer.jsp. This catalogue is based upon the international standard ISO 19115.

5.4.2 Metadata catalogues availability + standard

IGN

In 2010 IGN created a new metadata profile based on ISO 19115 and the INSPIRE specifications. The profile implements the INSPIRE implementing rule for metadata and extends it with extra elements (ISO 19115) about quality and distribution.

Currently, IGN is also working on a new geoportal for metadata. This geoportal will give the public easily access to all the available metadata. The geoportal will later on be extended with viewing and downloading services.

5.4.3 Dublin core metadata standards for GI-discovery

Not available

5.4.4 Metadata implementation

IGN

IGN is responsible for the creation of its own metadata.

The challenges for the future are a more automated production process for metadata and the creation of a special metadata database.

5.4.5 Conclusions of Component 4

Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE. The INSPIRE 2010 MR confirms the statement. 74% of the reported data sets have metadata. Metadata catalogues exist in Flanders and Wallonia. Metadata implementation tends to be more decentralised. Nevertheless IGN and AGIV play an important role.

Based on these conclusions we score the indicators as follows:

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

5.5 Component 5: Network services

On the next page an overview of services and their characteristics are given for both NGI and AGDP.

Moreover a test portal is running http://www.ngi.be/testbed/ (where mainly WMS map services are tested).

Another service is the http://www.ngi.be/gdes/faces/index.jsp which describes graphically the geographical objects stored in the topographic inventory (ITGI).

5.5.1 On-line access service for metadata of reference data and core thematic data

An on-line metadata catalogue for the national GI products is available as from May 2005 on the website http://mercator.belgie.be/explorer.jsp. This catalogue is based upon the international standard ISO 19115.

Services					
Service[6]	**Organisation responsible**	**Type of service[7]**	**Metadata (N/Y/ISO)[8]**	**Open for Public (Y/N)**	**Free/Not free[9] (Y/N)**
Ferraris Maps Viewer	Ferraris Maps Viewer	Ferraris Maps Viewer	Ferraris Maps Viewer	Ferraris Maps Viewer	Ferraris Maps Viewer
Topographic maps WMS	NGI	View	Y	Y	Y
http://www.ngi.be/testbed/pages					
Combined Topographic maps WMS	NGI	View	N	N	Y
InfoShop (online map ordering)	NGI	View	N	Y	Y
Topomap Viewer	NGI	View	N	N (in testing)	Y
Map2Date	NGI	Crowd sourcing	N	N (in testing)	Y
D4A (Digital Access to Aerophotography Archives)	NGI	View, Download	N	N (internal use)	Y
Coordinate transformation (for text, .csv, shape)	NGI	Transformation	N	Y	Y
Coordinate transformation (SOAP)	NGI	Transformation	N	Y	Y
Eurogeonames WFS service	NGI	Download	N	N	Y
http://www.ngi.be/egn-wfs/services					
CADMAP WMS	AGDP	View	N	N	
EuroBoundaries	AGDP	View	N	N	
CADNET	AGDP	View	N	N	
Print On Demand	NGI	View	N	N (in testing)	Y

[6] List the names/IDs and where possible the link (URL) of all the discover, view, download, transformation and invoking services that are part of your infrastructure
[7] Indicate the type (discover, view, download, transformation and invoking services)
[8] Indicate whether the service has no metadata (N), or metadata according to ISO 19119 (ISO).
[9] Whether or not the service is free for use.

AGN (Active Geodetic Network)	NGI and partners	Download	N	Y	Y

URL: see 08_NGI_Services_URL_Statistics.doc

5.5.2 On-line access service for reference data & core thematic data

On-line geodetic documentation application

The online geodetic documentation is a web-based, GIS application that allows users to search for, and retrieve geodetic markers information using a graphical interface. The information about geodetic markers includes description, coordinates, photographs, graphic and sheet. This application is completely free, and does not require registration to use.

See:

in French: http://www.ngi.be/gdoc/default_fr.htm

in Dutch: http://www.ngi.be/gdoc/default_nl.htm

On-line paper maps distribution application

An application, called "Infoshop", relates to the topographic charts.

This application allows:

- to locate itself in the cutting of our maps
- to know the availability and the date publication
- to order online

This application is completely free, and does not require registration to use.

See:

in French: http://www.ngi.be/FR/FR-infoshop.htm

in Dutch: http://www.ngi.be/NL/NL-infoshop.htm

Ferraris Viewer

Web-based, GIS application that allows users to localize and visualize the scanned Ferraris maps (“carte de cabinet des Pays-Bas autrichiens et de la Principauté de Liège (1771-1778)”. The maps are served on an external server of the Royal Library of Belgium, and the search and location functionalities are on the NGI web server.

See:

in French: http://www.ngi.be/FR/FR1-4-2-3.shtm
in Dutch: http://www.ngi.be/NL/NL1-4-2-3.shtm

Topomap Viewer

There are Web-based, GIS application that visualize raster datasets, from Top250r to Top10r and orthoimages. These are currently with restricted access, tested by partners.

Map2Date

Extension of Topomap Viewer, Crowd-sourcing web-based GIS application that allows the surfer to send his input about up-to-dateness of the maps (Currently internal use).

PrintOnDemand

Web-based GIS application that allows the client to give his specifications of self-centred topographic map that shall be printed and sent to him (Currently internal use).

5.5.3 Inter-linkages of on-line access service for metadata of reference data and core thematic data

The future applications will be interlinked.

5.5.4 OpenSource software and access services

No OpenSource software is used for the access services. The applications described in 5.5.2 are based on ESRI software.

5.5.5 Availability of web mapping services and WebMap server interface

- WMS :

testbed: The testbed website (http://www.ngi.be/testbed/) provides wms services for:

- Top100R_L08
- Top100R_L08
- Top10Rgris_Fused_L72
- Top10R_L08
- Top10R_L72
- Top50R_L08
- Top50R_L72

Registered users can download the exact URL that matches all of their queries.

The "Belgian Topo WMS visualisation service" allows the visualisation of the Belgian Topographical WMS services within the WebMapViewer of the SSE Portal. This is a free service. It enables users to assess the quality of the WMS maps. http://services.eoportal.org/portal/order/PrepareOperation.do?serviceId=2780CF80&operation=Search

Examples of use of the NGI top50r WMS:

http://www.ngi.be/dhjgt56tyjksg/com.esri.wms.Esrimap?BBOX=15000.0,100000.0,287000.0,233000.0&WIDTH=400&HEIGHT=300&SRS=EPSG:31370&LAYERS=15,1,&version=1.1.1&service=WMS&FORMAT=PNG&request=getmap

http://www.ngi.be/testbed/wms/top50r_l08_fr?layers=0&crs=epsg:3812,&version=1.3.0&transparent=false&format=image/png&service=wms&request=getmap&styles=&exceptions=application/vnd.ogc.se_inimage&srs=epsg:3812&bbox=664695.3010545,653858.242537,666101.5510545,655264.492537&width=360&height=360

Combined Topographic rasters WMS: this service is hosted by a geoserver and is currently a proof of concept more than an official service. Depending on the scale of the request, the geoserver answer displays various datasets, from Top250r to Top10r and orthophotos.

- WMS interface : see 5,5,2

5.5.6 Availability of catalogue services to regulate access

Not available.

5.5.7 Availability of catalogue services that perform payment operations

Not available.

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

Not available.

5.5.9 SDI user applications

cConvert -application

cConvert is a coordinates conversion software operating under Windows. This program is completely free, and does not require registration to download.

Conversions are performed between the various following systems and associated projections used in Belgium:

BD72 - Belgian Datum 1972

- three-dimensional coordinates:
  - Geographic: latitude (φ), longitude (λ) ellipsoid height (h).
  - Geocentric (Cartesian): (X, Y, Z)
- plane representation associated: Belgian Lambert 1972.
  - plane coordinates (x,y) + orthometric height (H)

ED50 - European Datum 1950

- three-dimensional coordinates:
  - Geographic: latitude (φ), longitude (λ) ellipsoid height (h).
  - Geocentric (Cartesian): (X, Y, Z)
- plane representation associated: UTM (Universal Transverse Mercator)
  - zones: 31, 32
  - plane coordinates: Easting, Northing

ETRS89 - European Terrestrial Reference System

- three-dimensional coordinates:
  - Geographic: latitude (φ), longitude (λ) ellipsoid height (h).
  - Geocentric (Cartesian): (X, Y, Z)
- plane representation associated: UTM (Universal Transverse Mercator)
  - zones: 31, 32
  - plane coordinates: Easting, Northing

-Lambert 1972
-Lambert 2008
-UTM
-ETRS_LCC
-ETRS_LAEA

5.5.10 Availability of geo-processing services

Not available.

5.5.11 Conclusions of Component 5

The Monitoring report confirms that there are one discovery and 26 viewing services, while 1 download and transformation services were reported. No information was found regarding middleware services allowing data services to be invoked. Although there is one download service reported, this is only for the Flemish region (FTP type of service)

and is not clear if standards are used. Similarly the transformation service is one from IGN and only related to coordinate transformation, without being clear if standards are used.

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 (Not so clear)
- There are one or more middleware services allowing data services to be invoked (No)

5.6 Component 6: Thematic environmental data

CLC95 and I&CLC2000 programs

The Belgian part of Corine Land Cover programs is realized by NGI.

The objective of the pan-European project CORINE (COR = Coordination, IN = Information, E = Environment) is the provision of a unique and comparable data set of land cover for Europe using 44 classes of land use.

The classification was done on high resolution Landsat satellite images. Different sources (orthophotos and the different maps and databases of NGI) were also used for the identification.

See:

in French: http://www.ign.be/FR/FR1-5-4.shtm

in Dutch: http://www.ign.be/NL/NL1-5-4.shtm

Further thematic data are such as Land cover maps (1:300.000) and Map of Shipping lanes (1:250.000) are available at: http://www.ign.be/NL/NL1-2.shtm

5.6.1 Conclusions of Component 6

A majority of environmental themes of the INSPIRE Directive are covered and reported in the 2010 MR. At the same time environmental bodies and agencies are more active in the field (e.g. VMM, INBO, …)

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

5.7 Standards

There is over the last 2 years a clear rising interest in the application of standards (in AGIV, IGN, …), but there is no overall strategy and coordinated approach (yet). The application of the OGC type of standards is strong in the Flemish and Walloon region, but not so pronounced at the federal level.

5.7.1 Conclusions of Component 7

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

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

6 Annexes

6.1 List of SDI addresses / contacts for Belgium

Table: SDI contact list

NSDI/RSDI	Web address	Organisational mailing address	Over-all contact person: tel./fax/e-mail
Centrum voor Informatica van het Brusselse Gewest / Centre d'Informatique pour la Région Bruxelloise	http://www.cirb.irisnet.be/	Kunstlaan 21, Bus 10 1000 Brussel	Francois Du Mortier Tel: +32-2-235.05.98 Fax: +32-2-230.31.07 fdumortier@cirb.irisnet.be
INFRASIG/ Comité Technique Cartographique	http://cartographie.wallonie.be/	Rue Van Opré, 91, 5100 Jambes	Mons. Jean-Pierre Kinnaert, Directeur à la Direction du Contrôle et des Etudes (DCE) de la Direction générale des Pouvoirs Locaux (DGPL) du Ministère de la Région wallonne (MRW) Tél : 081/32.37.23 Fax : 081/32.37.62 Jp.kinnaert@mrw.wallonie.be
Federal Platform Geographic Information (FPGI)			Ir. Ingrid Vanden Berghe, NGI - Director General Email: ivb@ngi.be Tel: +32 2 629.82.11 Fax: +32 2 629.82.12 Or Mr. Daniel De Brone, GAPD - Administrateur général / Administrateur - generaal daniel.debrone@minfin.fed.be

			Tél : +32 257 628 53 +32 257 636 68 Fax +32 257 617 52
Administration générale de la Documentation patrimoniale / Algemene Administratie van de Patrimoniumdocumentatie	http://www.fiscus.fgov.be/interfakredfr/Taken/overzicht.htm	North Galaxy (B8) Bd du Roi Albert II, 33, bte 50 1030 Bruxelles Koning Albert II-laan 33, bus 50 1030 Brussel	Mr. Daniel De Brone, Administrateur général / Administrateur - generaal daniel.debrone@minfin.fed.be Tél: +32 257 628 53 +32 257 636 68 Fax:+32 257 617 52
Nationaal Geografisch Instituut / Institut Géographique National	http://www.ngi.be	Abdij ter Kameren, 13 / Abbaye de la Cambre, 13 B-1000 Brussel / B-1000 Bruxelles	Ir. Ingrid Vanden Berghe, Director General Email: ivb@ngi.be Tel: +32 2 629.82.11 Fax: +32 2 629.82.12
Agency for Geographic Information Flanders (AGIV)	www.agiv.be	Gebroeders Van Eyckstraat 16, 9000, Gent Belgium	Leen De Temmerman Tel: +32 9 2617221 Fac: +32 9 2315299 Email: Leen.detemmerman@agiv.be

6.2 List of references for Belgium

Table: list of references used to compile the Country Report	
Web sites:	
Brussels Urbis	http://www.cibg.irisnet.be/site14/plone/operationele-departementen/diensten/urbis
	http://egeols222.egeo.sai.jrc.it/etemii/reports/d311.pdf
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