Geographic Information Policies in Europe: National and Regional Perspectives

Report of the

EUROGI-EC Data Policy Workshop,

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1. Introduction

The background to this report is a one-day workshop organised by the Joint Research Centre and the General Directorate "Information Society" of the European Commission in partnership with EUROGI. The Joint Research Centre is running a project called "GI/GIS Harmonisation and Interoperability". As all JRC projects it is designed to support EU policy. It provides scientific and technological support to policy makers on GI/GIS issues at European level and also provides a link to various space-related activities. In particular it was designed to support the high level working party of GI2000. This meeting reflects the effort of the Joint Research Centre and the Information Society Directorate to give the opportunity to National Organisations, in charge of defining National Policies, to know, compare and discuss topics of common interest and to help the Commission in understanding how to formulate a European Policy compliant with on going and emerging National initiatives. The meeting was hosted by RAVI, the Dutch national organisation for geographic information, on the 15th November at its offices in Amersfoort. The list of participants is in Appendix 1.

1.1. Objectives of the Meeting

The primary objective of this workshop was to start putting together a picture of what is happening in different European countries at the present time with respect to data policies in general, and Geographic Information policy in particular. The main task of the workshop was therefore to identify similarities and differences in data policy initiatives taking place across Europe, and key issues that may need addressing at the supra-national level. A further objective was to highlight gaps in current knowledge where additional information is required, and suggest ways in which these gaps could be filled.

The presentations made at the workshop can be divided into two groups addressing national/regional data policy initiatives, and European initiatives or projects respectively. In respect to the former, the participants were asked by the organisers to consider the following:

- Basic facts about the country: e.g. population, area, distribution of administrative responsibilities between central, regional and local government etc.

- Who are the main providers of geographic information: e.g. role played by cadastre, national mapping agency, national statistical institute etc.

- The institutional context of national geographic information policy: e.g. policies relating to access and dissemination, legal protection etc.

- Elements of national spatial data infrastructure: e.g. mechanisms for coordinating national policy, provision of core data sets, development of national metadata services etc.

- Current burning issues under discussion: e.g. future of national mapping agency, freedom of information legislation.

1.2 Structure and Objectives of this Report

There are three objectives to this report:

1. Provide a coherent overview of geographic data policies in Europe building on the presentations made at the meeting, and other material available,
2. Provide references for further reading,
3. Become the starting point for further discussions reflecting the development of data policies in Europe.

The report is structured as follows: Section 2 summarises the developments at national/regional level, Section 3 reports on European projects and initiatives presented at the meeting, and Section 4 discusses the findings and possible ways forwards.

2. Data Policies and Initiatives at National/Regional level

AUSTRIA

Austria is a federal republic of some 8 million people with a land area of 84,000 km^2. Data policy responsibilities are divided between central government, which maintains through its agencies topographic mapping, cadastral information, and socio-economic data, and the nine provinces to which legislation devolves power in matters of environmental monitoring and land-use planning.

Clear data polices have not been defined at either national or provincial level. The general principle is that almost all data sets are charged for on a case-by-case basis. There are frameworks of agreements for sharing data between government agencies at federal level, and between federal and provincial levels. Customers outside government are charged fees subject to negotiations, but at less than full cost-recovery. Similar arrangements also take place at the provincial level, with varying pricing schemes and ad-hoc tariffs.

At this level, a system of documenting what data is available, and under what terms, has still to be developed. On-line sales are also poorly developed. On-line data services are instead being developed at federal level particularly in the areas of environmental and cadastral data. The latter are increasingly used by the professional community for on-line property searching and transacting.

To be noted that access to environmental data is free, as a result of implementing the 1990 EC Directive. This raises some institutional issues as the data is supposedly maintained by the Provinces.

A key actor is the National Mapping Agency (Bundesamt für Eich- und Vermessungswesen http://www.bev.gv.at). The agency provides a number of topographic datasets, and also acts as portal to the cadastral information. The agency is in the process of being partly privatised, and is therefore going through considerable organisational change. At present, a major issue in respect to the topographic datasets is the conversion to UTM reference system, which is expected to be completed by 2008.

In respect to the three key features of a geographic data infrastructure, following are the main points:

Core data: some key datasets are available at federal level in respect to topographic, environmental, and cadastral information. The latter is the most developed. Linkages with other federal datasets e.g. socio-economic data are yet to be fully developed as are the linkages with data held at provincial and municipal level.

Metadata: developed for the datasets above, but much work is needed at provincial (and local) level.

Co-ordination: the Austrian Umbrella Organisation for Geographic Information (AGEO) has been established in 1998. Its main priorities are building up its membership, after which it will play an increasing role in co-ordinating matters relating to the development of a GI infrastructure in the country.

FINLAND

Finland has 5.2 million inhabitants over a land area of 338,000 km^2, and is therefore characterised by an extremely low density of 15 inh/km^2. There are 475 local authorities with an average population of 11,000 people. Finland builds on a long tradition of centralised data management and databases common to other Nordic countries. Hence, it has developed a number of registers of population and land and property uniquely linked via personal number, and geographical co-ordinates. The advantage of having linked socio-economic data to individual properties via their co-ordinates for decades is that it is possible to perform longitudinal data analyses over time that are not affected by intervening changes in administrative boundaries. There is, therefore, an enormous wealth of very detailed geographic information available in Finland for analysis and research.

The pricing of digital datasets is a hot topic for discussion within the geographic information community in Finland and elsewhere. The basic pricing principles are that data required to fulfil a legal requirement should be free or available at dissemination cost. The rest is market driven but price should not prevent usage of data. On the contrary price should promote use rather than deter it. Having said that, the reality is that the conditions and level of pricing in Finland are not yet fully established. The definition of proper prices for datasets produced by the public administration in most cases is derived according to the market situation and the copyright of these datasets is strictly controlled.

The very low population density of this country has also spurred the development of widespread and sophisticated telecommunications infrastructure and remote-access services. Finland has both an explicit Information Society strategy, and a framework for developing its National Geographic Information Infrastructure. The two frameworks are explicitly linked. Geographic information is therefore recognised as critical to the development of society. The Ministry of Finance is in charge of government data policy, while the Ministry of Agriculture through the National Land Survey is responsible for promoting the use of GI.

Core data: Given the strong tradition of database management, the Advisory Committee for Data Administration in the Public Management (JUHTA) was able to define the criteria that distinguish "core data", and within a matter of 2-3 years get to a position were most of the data sets identified are available. Finland has therefore the most of the contents of its NSDI in place, including topographic, socio-economic, land and property, and network data. Its accessibility may however be hampered by the lack of a consistent pricing policy structure that takes into account the specific characteristics of digital information.

Metadata: an on-line metadata service covering over 300 datasets from 15 national organisations and a number of local authorities has been available since 1991. (http://www.nls.fi/ptk/aineistot/). An agreed national standard to describe these datasets has also been developed, which clearly provides a useful framework for both data providers and users. (http://www.intermin.fi/juhta/suositukset/jhs137.htm). The service is maintained by the National Land Survey (NLS), which checks for consistency. Although further developments will take place in terms of linking the national metadata standards to emerging international ones, and increasing the coverage of the data providers using such standards, there is little doubt that the existing system is already highly developed.

Co-ordination: whilst there is no legislation formally establishing the equivalent of a national centre for geographic information, the NLS has legal responsibility for promoting the shared use of GI in Finland. This has been backed up by a number of voluntary agreements and initiatives, within the framework of an explicit NGII document. The resulting infrastructure is of very high quality, but the voluntary nature of the process also puts considerable pressure on the organisations and individuals involved in the co-ordination. Moreover, the lack of an explicit legal basis with funding allocated to support this activity means that changing priorities in the organisations concerned may affect the long-term quality of the infrastructure. Some signs in this respect are already evident in the internal re-organisation at NLS and subsequent reallocation of staff who have to share the co-ordinating effort with other duties.

Other core issues refer to the quality of data and pricing. In respect to the former, there have been significant changes in the needs of users over the last few years. In the past some data was better than no data, and the main concern was over national coverage and consistency. Today, users demand much higher data quality and documentation, and how this can be delivered is linked both to organisational arrangements and pricing. As referred to earlier, there are still significant variations in data pricing policies among the providers and discussions are taking place on how to develop a consistent framework that generates revenues, and stimulates use among the small and medium enterprises.

FRANCE

France has a population of some 58 million people over and area of 544,000 km^2. Its structure of government includes 22 regions, 96 départments, 3500 cantons, and some 36,000 municipalities. Key players in the provision of data are the National Statistical Institute (INSEE), the National Tax Office (DGI), which is responsible for the

cadastre, and the National Geographic Institute (IGN). The INSEE has by and large a policy of data dissemination at cost of reproduction, although some specialised datasets such as SIRENE on economic establishments are charged differently. The DGI launched in 1990 a Digital Cadastral Plan (PCI) project to vectorise its paper-based holdings through a series of partnerships with local authorities and utilities. This programme has developed in the main urban areas and agglomerations, but given the size of the task with over 100 million land parcels on 560,000 sheets, a decision has been taken more recently to expedite the process by moving to raster images.

The IGN has traditionally been responsible for the topographic maps at 1:10000 scale or less. As an increasing number of digital products have become available, the agency has been criticised for a pricing policy which was perceived to maximise revenues at the expense of increasing the coverage and range of products, and the increase of use. The government commissioned a thorough review of the operations of the IGN in April 1999. The "Lagagne" report delivered in September recommends a refocusing of operations with priority given to complete and maintain national coverage for key dataset, including not only topographic maps, but also administrative boundaries, postal addresses, and geo-referenced rasterised cadastral plans in partnership with the relevant organisations. Moreover, it recommends that public subsidies are targetted clearly for the completion of these tasks, whilst fees charged are dedicated to updates and maintenance of the database. This approach, together with a charging mechanism based on volume of the requests and copyright royalties, would reduce the unit cost to consumers and increase use among final users and value-added resellers [http://www.ladocfrancaise.gouv.fr/ (see Rapports Officiels)].

Whilst the Lagagne report focuses on the IGN, a more wide-ranging cross-sectoral review of data policies in the information society has also been undertaken by the government and published in November 1999. The "Mandelkern" report (available from the same URL as above) identifies a number of opportunities and challenges created by the digital revolution. These include the potential for much greater dissemination of public sector information, and world-wide presence of the French culture, but also challenges in relation to the conditions of access to data for value-added resellers, pricing structures, and potential conflict between public and private sectors. GI is identified as one of the areas were such conflicts are particularly evident. The report also argues that whilst the nature of digital information, by making marginal cost of reproduction virtually zero, points to a policy of cost-free access to information, there are significant financial and organisational costs for public sector agencies to keep abreast of technology and maintain quality of service once they move on "the net". This suggests that some form of charging may be necessary, and different scenarios are explored, including the use of partnerships, advertising, or end-user fees.

Whilst France has had legislation on access to public sector information since 1978, the report makes the case for a policy of active dissemination of public sector information and recommends inter alia:

- That "essential data", defined as those necessary to all French citizens and residents to exercise their rights, should be accessible free of charge. Such data may include legislative, statistical, and geographic data such as administrative boundaries.

- That all agencies working for the public sector, i.e. including the utilities and private companies if working on a contract paid by the public sector, have the obligation of disseminating "essential data",

- That each organisation must submit to the government and to an independent panel a list of the "essential data" it holds already in digital format, and a digitization plan for that held in analogue format.

As far as "non-essential" data is concerned, the report envisages a two-tier structure, one for agencies like the IGN, and Meteo-France for which data dissemination is mission-critical, and another for the rest of public administration. The former will be allow to commercialise data directly, while the latter will have to do so through public-private partnerships. In any case, the report recommends that pricing should encourage usage, and be based on volume to reduce charges and maximise opportunities for the private sector.

The two reports summarised above may significantly increase access to public sector data and GI in France. At the present time, the situation in relation to a GI infrastructure appears as follows:

Core Data: socio-economic and some small scale topographic data are in place. Whilst large urban areas are also covered by other core data sets such as administrative boundaries, postal addresses, and large scale topographic and cadastral databases, major efforts are still needed to complete the coverage across the country.

Metadata: it exists on-line for large data producers but a national system covering public sector agencies across different levels is still to be put in place.

Co-ordination: GI policies are co-ordinated through the National Council for GI (www.CNIG.fr), which is an inter-ministerial council established in 1985 with representatives from all major government departments and GI-related agencies, and AFIGEO, the French association for GI which includes representatives from the user community and the private sector. A significant co-ordinating role in matters of information policy is however played directly by the government through the office of the Prime Minister and the Ministry of Planning. An action Plan for the Information Society (PAGSI) was presented in January 1998 (www.plan.gouv.fr)

GERMANY

The Federal Republic of Germany has a population of some 81 million people over 357,000 km^2. It is organised in 16 states (Länder) and some 8500 municipalities. Each Land is responsible inter-alia for its own topographic service, land and property registers, environmental and statistical data collections, and generally for data policy. Whilst, there is no federal law that regulates access to government data, legislation is most developed in the New Bundesländer. In Brandenburg the right to Freedom of Information is explicitly laid down in legislation. It relates to the right of all citizens to access public records held by state authorities, districts and cities, unless public or private interests prevail. In Germany discussion about access is most articulated in the environmental sector, again particularly in the Neue Bundesländer. In Brandenburg, Meckelburg- Vorpommern, Sachsen, Sachsen-Anhalt en Thüringen legislative

provisions have been made which allow everybody access to environmental information. In the other Bundesländer, opportunities for access to data vary from state to state.

A prominent role is taken by the 16 surveying and cadastral administrations, which are co-ordinated by Federal Ministry of Interior through a joint working party, AdV (http://www.adv-online.de/). AdV also provides common documentation of the geodata available and a pricing policy . AdV published in 1997 a geodata modelling concept (http://www.adv-online.de/neues/oinhalt.htm) and in 1998 the IMAGI geodata integration report on how to improve coordination in the field of geoinformation (http://www.ifag.de/BKG/bericht_fe.htm). In 1999 the government started its modernization program (http://www.staat-modern.de/) which should also have effects on the development of spatial data infrastructures in the near future.

ATKIS (http://www.atkis.de/) is a common initiative by the 16 state surveying authorities to develop a seamless digital, object-oriented topographic database 1:25,000 scale across Germany. It was conceptually developed between 1984 and 1989, and completed in 1998 at ATKIS/DLM-25/1 (attribute level 1). The updating of 63 base level 1 attributes is currently being undertaken and will be extended at level 2 with additional 55 feature attributes (ATKIS/DLM-25/2). Another major project is the conversion into digital format of the land register (ALB) and the related cadastral maps (ALK). The development of this system across the whole country has been slow and patchy but significant progress has now been made. ALB is now 100% digital, and ALK is complete for approximately 40% (full coverage is planned by year 2005). Integration pilot projects of ALB and ALK into ALKIS and its data model harmonisation with ATKIS are also being addressed .

Core Data: in respect to a geographic data infrastructure, the core elements are in place and there is a considerable amount of digital information now available at
- **federal level** (see for example: http://www.atkis.de - ATKIS; http://www.bgr.de/index.html - Georesources; http://www.statistik-bund.de/e_home.htm - Statistics; http://www.umweltbundesamt.de/ - Environment),
- **state level** (see for example http://www.lvsn.smi.sachsen.de/ - geospatial data of Saxony) and
- **municipal level**. A network exists for data exchange in public administration, but its interconnectivity via the Internet is still developing.

Metadata: it exists for ATKIS and for individual agencies. AdV provides a point of entry for geodetic, topographic, and cadastral data and the federal gazetteer of place names (see also BKG, http://www.ifag.de/). Additional work is however needed for seamless search of data across themes for the country as a whole allowing for example to search for topographic, statistical, and environmental data together.

Co-ordination: the AdV plays an important role for two of the core datasets, cadastral and topographic, but it is unclear how this links with other major holders of information, such as the statistical and environmental agencies. The German Umbrella Organisation for GI (DDGI) is the forum bringing together institutional players and data providers from across the country, with members from the private sector and academia. Through its initiatives it promotes synergy across the main stakeholders at state level, and linkages to the European dimension via EUROGI. The federal

dimension however (see the IMAGI report), will continue to be an essential characteristic of the German experience.

HUNGARY

Hungary has a population of just over 10 million people over an area of 93,000 km^2, almost 90% of which is agricultural (68%) or dedicated to forestry (20%). There are 20 regional authorities and 3,200 municipalities.

The main actors in the area of geographic information are:
- Mapping Agency of the Home Defence Forces (smaller than 1:10,000 scale) (http://www.mhtehi.gov.hu)
- The Ministry for Agriculture and Regional Development (MARD). Its Department of Lands and Mapping has the national responsibility for cadastral and topographic mapping up to 1:10,000 scale inclusive. It also serves as National Land Administration Agency and is responsible for FÖMI, a leading R&D institute in GI sciences (http://www.fomi.hu), where the National Remote Sensing Lab established in 1980 provides among others the operational countrywide CROPMON service for MARD.
- The Hungarian Central Statistical Office, which collects socio-economic and financial data and provides a detailed gazetteer of the Republic of Hungary (http://www.ksh.hu).
- The Institute for Territorial Planning (VATI), is responsible for data used for regional development, providing territorial information service called TEIR (http://vati.ktm.hu).
- The Ministry of Environmental Protection (http://ktm.gov.hu).
- The Ministry of Transport, Communication, and Water Management for data related to telecommunication, roads, railways and waters (http://khvm.gov.hu)
- The Hungarian Geological Survey (http://mgsz.hu), the Geological Institute of Hungary (http://mafi.hu), and the Eötvös Lorand Geophisical Institute (http://elgi.hu) provide geoscience data services.

In Hungary there is a strong land registry and cadastral tradition that goes back to the Austrian-Hungarian empire. It is therefore developing a computerised integrated system containing both textual and cadastral data using the application tailored TAKAROS and META systems. Some entries will be searchable through time to monitor changes.

Core Data: the textual element of the land registry is now in 100% digital format. Approximately 4% of the associated cadastral maps were available in digital format in 1998, 15% is anticipated for 2002. Base topographic maps at scale 1:50000 have full country coverage in digital format, while approximately 5% of the country is covered by map at scale 1:10 000 in digital format, with a significant activity being undertaken in digitising existing large scale maps. Standard and detailed information on the digital availability of socio-economic and statistical data and a detailed gazetteer can be found on the homepage of the Central Statistical Office. The TAKARNET data transmission network of the Land Administration (http://www.takarnet.hu) provides wide range of information on core data, products and services.

Metadata: an inventory and documentation of existing data sets is in progress using Z39.50 as standard. Two metadata servers have been set up, METATÉR Server at the Geological Institute of Hungary, (http://meta.mafi.hu) supported by the Prime Minister's Office and FISH (http://fish.fomi.hu), with a server at the Institute of Geodesy, Cartography and Remote Sensing (FÖMI).

Coordination: a national policy on data access and sharing is being developed by an Inter-ministerial Committee on Informatics under the auspices of the Prime Minister's Office. Another inter-agency committee is co-ordinating the digital map acquisition co-chaired by the two ministries with responsibilities in this area.

In respect to the key elements of a national spatial data infrastructure, there is significant progress being made at all levels, including legislation, technology, education and training, data, and overall institutional framework. European Phare, Tempus and R&D funding are proving beneficial for this purpose as well as the linkage of HUNAGI, the umbrella organisation for GI, with EUROGI in raising awareness further at national and local levels. Key issues for the future include the implementation of the framework being developed, and accession to the EU. This is being prepared through a national programme for the adoption of the Acquis Communautaire, which also has a separate subchapter devoted to key issues in land administration and mapping.

IRELAND

The republic of Ireland has a population of 3.6 million inhabitants over a land area of 70,000 km^2. Dublin and Cork are the main urban areas accounting for over 30% of the population. A Freedom of Information Act was passed in 1997 (http://www.irlgov.ie/finance/FREE1.HTM#[SU2]). The Act regulates access to public sector information with several exclusions. Access to publicly held information is notionally free of charge, however, government departments may charge for the time taken to extract the information requested. For example in the Department of Health the civil servant's time is charged at approximately 21 Euros per hour so that small searches may become potentially expensive.

The key central government producers of geo-referenced information are:
• the National Statistical Office (www.cso.ie)
• the Ordnance Survey of Ireland (http://www.irlgov.ie/osi/)
• the Geological Survey (http://www.irlgov.ie/gsi/)
• the Land Registry (http://www.irlgov.ie/landreg/)
• the Heritage Service (Duchas)
• the Department of Agriculture (http://www.irlgov.ie/daff/areasofi.htm).
The latter has significant data holdings (primarily aerial photography) but these are not open to public access.

Information held by these agencies are available on the GeoID (Irish pilot meta database) http://www.tcd.ie/Geography/GIS/Geoid/

Local authorities also produce geo-referenced material, but the extent and accessibility of these vary. The Local Government Computer Services Board has

made some inroads towards standardisation and best practise guidelines. Private data producers also exist, and in some cases their products, pricing and leasing arrangements rival those offered by central government suppliers. An example of this is the PinPoint product offered by IRIS in competition to the OSi/An Post's GeoDirectory. Both these products offer the ability to geo-code addresses, but with different pricing options.

Data Pricing
The OSi have a general framework for data dissemination and pricing. The pricing of all data requests are dealt with on a case-by-case basis. Copyright is strictly enforced and charges for data are levied among government departments as well as requests from the public. In December 1999, an agreement was finalised for supplying base data at preferential rates (less 80%) to academic institutions for teaching and research use.

Examples of charges are as follows:
1:1,000 digital urban data are charged at £450 (571 Euros) per tile ($0.48km^2$) + an optional £90 (114 Euros) per annum for updates. 1:2,500 digital rural data are charged at £1000 (1270 Euros) per tile ($3km^2$) plus an optional £200 (254 Euros) per annum for updates. Statistical and land and property data are not available on-line beyond headline statistics.

Core Data:
The key completed digital topographic datasets available are: 1:50,000 scale for the whole country, and 1:1000 for all urban areas. Key topographic digital datasets in progress are: 1:2,500 for rural developed areas, and 1:5,000 for rural un-developed areas. Other mapped core data include various administrative boundaries (DEDs, Counties, Townlands, Baronies).

Metadata: a pilot project was launched in partnership between IRLOGI and the University of Dublin/ DIT (http://www.tcd.ie/Geography/GIS/Geoid/). Thirty-one major producers of data participated in this bottom-up exercise, which is a very useful indicator of what can be achieved.

Co-ordination: IRLOGI (http://www.irlogi.ie/) acts as umbrella organisation with membership from the public and private sector. It organises seminars and workshops but has no formal powers to co-ordinate GI policy. The lack of government involvement and lead is one of the crucial issues in Ireland.

ITALY

Italy has a population of 57 million inhabitants over a land area of just over 300,000 km^2. Its system of government is organised through 20 regions, 106 provinces, and over 8000 municipalities. Since the devolution of the 1970s the regions became responsible for land-use planning and territorial management, and in 1990 a second decentralisation gave powers to the provinces in respect to environmental management. The municipality remains however the cornerstone for public administration at the local level.

The main producers of geographic information at the national level are the National Statistical Institute (ISTAT) (www.istat.it), the Cadastral Agency of the Ministry of Finance, the Hydrographic Military Institute and the National Military Institute (IGMI) which has traditionally been responsible for mapping at 1:50,000 scale and smaller. Larger scale topographic mapping is undertaken by the municipalities, provinces, and regions for their own territory. Since the 1970s, the regions have played a major role in producing topographic maps, but the lack of a clear division of responsibilities between them and the IGMI, has resulted in fragmentation, delays, and different standards. Only in 1997 an agreement between central and local government has started paving the way to a more coherent policy aimed at developing a national topographic database. The innovative feature of this agreement is that it focuses not on "maps" but on a topographic database able to integrate inputs from both local and central level organisations. Common rules and standards have now been defined and the objective is to have at least 10% of the national territory, covering the main population centres, at large scale 1:1000-1:2000, and the whole territory at 1:10,000 scale for at least the main themes such as road and river networks, geodetic framework, and administrative boundaries by 2006-08. To support the work of the municipalities, over two hundred technical centres are envisaged across the country to help develop and maintain the database, and integrate it with other information coming from the utilities and the cadastre (see below).

Socio-economic data is available from ISTAT at municipal level. More detailed data down to the census track or below, may be available from the local authorities on a case-by-case basis. All administrative boundaries are available in digital format.

A major programme to convert the cadastre into digital format was initiated in 1986. By 1993, 27% of the 310,000 map sheets had been digitised and new transactions requiring a local survey were also conducted in digital format. Given the size of the task necessary to complete the project, legislation was passed in the mid 1990s devolving the responsibility for the urban cadastre to municipalities. This clearly made sense, particularly since changes in taxation meant that 65% of the local taxes are related to land and property, giving an incentive to local administration to maintain an updated inventory of properties in their boundaries. In reality though, only larger municipalities have the institutional capacity to develop and maintain a digital cadastre. For the vast majority of municipalities, which have a population of less than 10,000 inhabitants, this remains a major challenge, and discussions are taking place on the best course of action.

In broad data policy terms, there is a general law for cost-free access to public sector information (241/7.8.1990), although in many cases access depends on the existence of a legal interest. There is no general law or policy concerning commercialisation of public sector information, and prices for commercial use vary from one public sector organisation to the next.

Core data: at the national level, socio-economic data is the best developed, with major gaps still existing in respect to topographic and cadastral information. However, it is important to recognise that there is a strong regional dimension to the collection and maintenance of geographic information in Italy, and that the provision of core data in some regions is well developed.

<u>Metadata</u>: generally poorly developed both at national and regional/local level.

<u>Co-ordination</u>: given the regional dimension highlighted above, co-ordination tends to be from the bottom up rather than top-down. A Co-ordinating Technical Committee was established as a result of the agreement between central and local government in relation to topographic data. That agreement also envisaged the de-militarisation of the IGMI, and the setting up of a national centre for geographic information along the Portuguese/French model. This has not taken place yet, and co-ordination at the national level on data/geographic information policies is somewhat fragmented.

The issues relating to co-ordination, and the development of a coherent dissemination policy are among the two most pressing issues in Italy at the present time.

NETHERLANDS

The Netherlands is one of the most densely populated countries in the world with over 15 million people living in just less than 41,000 km^2. Local administration is organised in 10 provinces and 650 municipalities. The three main providers of geographic information are the Cadastre, the Topographic Agency, and the Statistical Bureau. The Cadastre is required by law to recover its operational costs through data sales, but is forbidden from making profits from its core activities (i.e. any profits are recycled in the business and transferred to customers through lower fees). Both the Topographic and Statistical Agency receive core funding for their activities but are required to increase revenues from sale of data and services.

The government document "Towards the accessibility of Government information" of the 6th June 1997 sets the framework for the use of government data along the following principles:

- Access to data is regulated by the Government Information Act, and should be normally free or at dissemination cost.
- The provision of data to third parties must be non-discriminatory and at uniform price. Licences can be granted through public auction to private parties, who can then process and exploit the databases for a fixed number of years.
- Public organisations should only collect and process data that are necessary to perform their statutory duties. Enriching public datasets by integration with additional data is permitted only if clearly linked to a public task.
- Politically authorized permission can be given to process public data in ways which go beyond what is necessary for merely carrying out the public task, as long as the market does not already provide this data and it can be shown that this data is of societal importance. The data can then be made available to third parties.

An example of data of societal importance is that held by the Cadastre. In his letter to the Dutch Parliament of the 10th July 1998, the Minister for Housing makes the case that facilitating access to cadastral information lies outside the direct implementation of the Cadastre Act. However, given the societal importance of this information, the Cadastre should provide access to partially processed cadastral information to third parties on the basis of the open and non-discriminatory principles outlined above. These parties can then add value to this data and market it. The Cadastre for its part

must ensure that it complies with privacy legislation, must guarantee the integrity and security of the databases, and must cover its costs.

The response of the business community to the opportunities created by this policy framework has been generally positive. However, there is also a feeling that the mission statement of the government's accessibility document is unclear, and that insufficient insight is given in the document to the expectations of the demand for information. This must be investigated more carefully. Therefore the business platform, in cooperation with the Netherlands Association of Enterpreneurs, plans to start a project ascertaining the economic impact of making government databases (and the resulting information products) accessible at a low threshold.

Other important initiatives stem from the discussion document for a National Geographic Information Infrastructure (NGII) launched in 1995 by RAVI, the Dutch council for Real Estate Information. RAVI is under the responsibility of the Minister for Housing Spatial Planning and the Environment, but has also strong linkages with the GI user community, and the private sector (http://www.ravi.nl/). The NGII is defined in respect to policy, geographic data sets, technology, standards, knowledge and education. It is also linked to the governments Action Plan for the Implementation of the Electronic Highway. The case for developing a NGII was also strengthened by the emergency needs created by the severe flooding that took place in 1995.

Core Data: in addition to the cadastral database and socio-economic data, the two foundation blocks are the 1:10,000 scale map for the whole country which is being developed by the Topographic Agency, and the large scale 1:1000 map being developed by a consortium including the Cadastre, Dutch Telecom, local government, and the utilities. Both are close to completion.

Metadata: it is estimated that there are 36,000 data sets in the public sector of potential use to others. Documenting these datasets and making them visible to potential users is therefore a crucial task. For this purpose a National Clearing House Project was initiated by RAVI in 1995 (http://www.ravi.nl/clearing.html).

Co-ordination: RAVI has been playing a crucial role in developing a vision for an NGII, creating awareness, and developing political support. Much progress has been made over the last few years, but given that this organisation has no formal powers to compel public agencies to participate in the plan, developing consensus and sense of purpose is difficult. Following are some of the currently burning issues:

- Create a better link between the two core data sets described above, which are the responsibility of different agencies and partnerships,
- Overcome some of the existing barriers to data availability, including organisational perceptions that it is inconvenient or threatening to give access to one owns data, data owner's restrictions on re-sale, commercial and governmental confidentiality restrictions.
- Address issues of pricing of data so that use and re-use are not deterred, and move to a framework of high volume-low price,
- Address the issue of the large amount of data still in analogue format,

- Develop awareness and policies not only for the large public sector organisations for whom data-related services are mission-critical, but also for the large number of small and medium organisations in both public and private sector across the country.

NORWAY

Norway has a land area of 324,000 km^2 and a population of approximately 4.5 million. There are 435 local authorities with an average population of just over 9,000 people.

Freedom of information legislation gives the public rights of access to government information. This right was extended in 1985 to include computerised records. Although in principle government information should be free of charge to anyone, in practice a government report (Til informasjonens pris, NOU 1994) identifies instances in which information can be charged for, namely when free access to information results in evidently irrational use of resources, or the information is made available to the private sector for further reuse and distribution. A fine line also exists between information that an agency has as part of its government function, which should be free, and that possessed as part of its business activities, which can be charged for. Issues of format of delivery, and amount of information requested also obfuscate the implementation of the basic principle of free access.

The Data Protection Act grants access to individuals in respect to their personal records held by government agencies. Access is normally given through copies or printouts and is not normally charged for. Databases can be protected by copyright while laws, court decisions, and other decisions made by government authorities are not. Factual information used for government decision-making, such as statistics are not covered by copyright.

The Norwegian Mapping Authority (NMA) has a key role in establishing and managing "Norway Digital", and making products and services for sale to the customers. The national primary datasets consist of uniform, nation-wide digital data for essential sea and land themes, to be used as a basis for digital and analogue products. They consist of:

- Buildings
- Addresses
- Properties
- Administrative boundaries
- Place names
- Road network
- Elevations
- Depth contours
- Coastal contours and islands
- Water contours
- Triangulation points

The standardised digital and analogue products from the NMA consist of vector and raster data for land and sea areas in scales ranging from 1:5,000 to 1:5 million.

Cadastral information is available from the municipalities and information on rights from the courts (the EDR database). The Norwegian Mapping Authority (NMA) maintains a database on property information for the whole country (GAB), with co-ordinates for buildings, addresses and properties, and some rights information, mainly who owns the property. On-line connection to this database is restricted to the municipalities, who update it directly on a daily basis. A government owned company has a product which is a combination of GAB and the information from the courts

(EDR). It is available as an on-line service and a CD-ROM, which can be bought from the NMA (who is a distributor for this company). Use is mainly restricted due to privacy protection, but the company is supposed to have full user payment for its products. More information about it at its website: http://www.eiendomsinfo.no/. Both GAB and EDR are updated on a daily basis. Pricing for cadastral information is based on statutory requirements.

Statistical information is collected an maintained by Statistics Norway, which distributes it largely free of charge or at most at marginal cost. Several datasets can be downloaded from its web site at http://www.ssb.no/.

Environmental information: a major project, AREALIS, aims at developing a complete dataset on geographical, environmental and planning information for municipalities and counties. The project is co-ordinated by the Ministry of Environment, which is also in charge of the NMA. It includes most other agencies under the Ministry, as well as many other national agencies. Participants include:

- NIJOS (agricultural sector) http://www.nijos.no/indexeng.htm
- The Geological Survey of Norway http://www.ngu.no/engelsk/default.htm
- Norwegian Geotechnical Institute http://www.ngi.no/english/default.htm
- Directorate of Nature Management http://chm.naturforvaltning.no/
- The Directorate for Cultural Heritage http://www.riksantikvaren.no/index5.html
- The Norwegian Pollution Control Authority http://www.sft.no/eindex.asp
- The Norwegian Water Resources and Energy Directorate http://www.nve.no/english/index.html
- Ministry of Cultural Affairs http://www.odin.dep.no/kd/eng/index.html
- Statistics Norway http://www.ssb.no/english/,
- all the counties and up to 53 municipalities.

Core Data: from the summary above it is clear that a lot of core datasets are already in place. However it takes some effort to organise it within a well developed framework.

Metadata: there are at present a number of metadata services maintained by individual agencies, such as the NMA's (www.statkart.no) and that of Statistics Norway. A National Geographic Information Center (NGIS) is being established to bring together in a co-ordinated fashion these different access points. NGIS will also provide a on-line connection for those who want to subscribe to databases and be updated on a daily basis. So far this is on a trial basis with certain agencies.

Co-ordination: the core datasets are established and updated via Geodata co-operation (GEOVEKST). These are local projects established according to a national framework. The main players are

- Municipalities
- Public Road Administration
- Telenor (telecom)
- Electricity companies
- Agriculture
- NSB (railways
- NMA (represented by local county offices)

Local projects are carried out according to annual Geodata plans. Each participant contributes with money, work and competence according to their means. The resulting database are jointly used by the participants. For 1998 the total amount used

on these projects were NOK 65 millions. External access to these datasets is regulated through two types of rights:

- Usage right: to use the product internally or for private use. The customer can buy, or for digital products they can also subscribe, which include updates.
- Marketing right: to make copies for sale. Use on Internet requires marketing right, the conditions are that it can only be used on the customers own web site and must not be adapted for downloading.

GeoForum is the Norwegian umbrella organisation for geographic information, with over 300 member organisation from both public and private sector. It is the Norwegian representative in EUROGI.

PORTUGAL

Portugal has 9.9 million people over a land area of 92,000 km^2, and 275 local authorities with an average population of 36,000 people. The main feature of its national spatial data infrastructure, the SNIG, is that this has been established by legislation in 1990 together with a National Centre for Geographic Information (CNIG) to co-ordinate its development. This clearly indicates a strong level of political support at the national level.

SNIG (http://snig.cnig.pt) is now well established providing on-line services acting as a one-stop shop for the data holdings of a large number of agencies at national and regional level. Moreover, its efforts to support local authorities in developing and making accessible digital geographic information are particularly noteworthy. Direct access to data such as orthophotos, environmental and statistical data is also possible.

Core data: rather than starting from the prior identification of what is "core data", the approach has been to put together what was possible, build awareness, and create demand. A large number of data sets are now available via SNIG, but their pricing structure is variable, and in some instances such as the statistical data from INE, prices can be significant and act as potential barrier to accessibility. Given the large amount of information currently available, the key future challenges refer to land and property data (cadastre), street centre lines, and addresses.

Metadata: the provision of Metadata is well structured and centrally co-ordinated by CNIG. This has the advantage of consistency of documentation but also creates complexity in respect to updating the information generated by the individual data owners.

Co-ordination: CNIG plays a crucial role in this respect. It has the strength of being backed-up by legislation, and of having funds, partly national and partly European, specifically directed towards building the infrastructure. A key feature of the CNIG is that its mission is supporting data producers in making their data available through SNIG, rather than producing GI in its own right. Moreover, CNIG has developed very strong networks with key decision-makers in government supporting its mission. Also, of particular significance are the strong linkages with the academic sector, which itself is very well connected with the international research community. This helps CNIG to support its already sizeable group (14 people) dedicated to the

development of SNIG, with access to a pool of post-graduate students of high calibre bringing in the latest technical solutions. This is an excellent model to be noted by other similar initiatives.

UNITED KINGDOM

The UK has a population of just over 58 million inhabitants over a land area of 244,000 km2. There are 403 basic local authorities (districts) with an average population of some 145,000 people. By comparison to other countries, the UK stands out in a number of ways. Firstly, the institutional framework is such that in effect what is being discussed is the framework for England and Wales, as Scotland and Northern Ireland have their own particular sets of circumstances, although many of the issues discussed would also apply. Secondly, Ordnance Survey (OS) of Great Britain is in the unique position of being responsible for mapping at all the scales, including the large ones which in other European countries are normally the responsibility of local government and the Cadastre. The OS exercises a virtual monopoly in the provision of mapping through the enforcement of Crown Copyright, which covers both maps and databases without requiring the mark of "originality" as in other European countries. The role of the OS is central also because its Director General is the advisor on GI matters to the Government.

Three other aspects are worth pointing out. In the first instance, successive governments have been pursuing an efficiency-driven policy, in respect to government departments, that has turn many of them into executive agencies with cost recovery targets. This has been coupled with an early recognition of the economic value of public sector information. GI, is a front runner in this respect, as it contributes three quarters of the £200 million raised by the Treasury through the sale of Copyright material. Finally, the uniquely large size of the average local authority in Great Britain (145,000) has made it possible to adopt a business model of high prices for relatively few large customers such as local government and the utilities. This model has been justified on the basis that the revenue raised has also enabled the investment necessary to create sophisticated data products and services in a relative short time. To date Great Britain is one of the few countries in the world to have completed in national topographic database, including large scales for all urban areas. It can also be argued that this model also fits the economic imperative of the government (both past and present). For example, it is worth noting that whilst Portugal and Finland have Information Society policies with a strong social dimension, the nearest equivalent in the UK, the Information Society Initiative, is run by the Department of Trade and Industry with the objective of "helping UK business thrive and be able to exploit the enormous potential of the Information Age" (http://www.isi.gov.uk/isi/).

Recent policy initiatives of relevance to data policies are:

The Future Management of Crown Copyright, White Paper, March 1999. (http://www.hmso.gov.uk/document/copywp.htm). This is a central document given the extent to which conditions of access and pricing in the UK have been affected by the interpretation and use of copyright. Having explored a series of options in a previous Green Paper, the Government indicates that crown copyright will be retained

in general and waived in specified circumstances such as government legislation and forms. New guidelines will be issued so as to provide a more consistent approach, ensure that copyright does not inhibit access to information, and set more coherent charging mechanisms for tradeable information (including GI). Moreover, government departments should produce regularly updated listings of material which they hold, documented with an agreed light metadata standard. This information will be kept and maintained through the departmental web sites but sign posted via a centralised Government Information Asset Register.
(http://www.inforoute.hmso.gov.uk).

The Freedom of Information Bill presented to Parliament n the 18th November 1999 (http://www.homeoffice.gov.uk/foi/index.htm). This sets the proposed framework for access to public sector information, with considerable debate on the extent of the exclusions.

The Modernising Government White Paper (http://www.citu.gov.uk/moderngov.htm) which sets as goal that all dealings with government will be delivered electronically by 2008 (50% by 2005).

Whilst the three initiatives above set the framework for data policy in general, the extent to which a geographic data infrastructure is in place in the UK is discussed below.

Core data: Most of the core data including cartographic, socio-economic and reference data such as street address and postcodes are now in place. A major step forward has also been the recent funding awarded for the development of a national land and property information service following the early trials in Bristol and Scotland. It should be noted that this will be a commercially based service in partnership between public and private sectors.

Metadata: the Spatial Information Enquiry Service (SINES) was the first attempt of developing a metadata catalogue of central government-held data. It operated for four years before being withdrawn, as it was proving difficult to maintain up to date. The National Geospatial Data Framework (NGDF) (http://www.ngdf.org.uk/) has recently launched a limited metadata service of the Standard Geographic Base units (UKSBG), which describes administrative and postal geographies. Meanwhile it has defined some metadata guidelines, and is encouraging their use by organisations in both public and private sector, with a view to link the metadata service they will provide through a common gateway. It may well be that this model will prove the more resilient in the long run to the organisational and technical changes in the market. It is however, taking a rather a long time to develop, as of summer 1999, there was no national metadata service operating in the UK. Whilst welcome, it is unlikely that the new Government Information Asset Register (see above) will respond to the needs of the GI community.

Co-ordination: There is a great deal of interest in the development of national information policy in Britain among the key players, now that the core data is largely in place and more attention can be given to linking it all together. In respect to co-ordination, the key players are the NGDF -financed from the National Interest Mapping Service Agreement negotiated by OS with the government- the

Interdepartmental Group on GI, representing central government departments, the Improvement and Development Agency for Local Government (http://www.idea.gov.uk/) , and the Association for Geographic Information (AGI) (http://www.agi.org.uk) which brings together over 1000 members from public and private sectors, data producers and users. Collaboration between these bodies is well developed, but clearly operating within a bottom-up market-oriented context. There is no high-profile central government led initiative to co-ordinate the provision and dissemination of GI at the national level, as is the case in other countries. In Britain, central government does not see this as its business, even though some of its core policies such as partnerships between government agencies in delivering services at the local level, would clearly benefit from a co-ordinated GI framework as the basis for sharing information. Whilst, limiting progress in some respects, this stand-off approach leaves more room to the participation of the private sector in the development of a national GI framework, and also fosters some innovative solutions.

WALLONIA

Given the institutional structure of Belgium, there are separate GI initiatives in the Flanders, Brussels and Wallonia. The Region of Wallonia has 3,3 million inhabitants, a land area of 16,000 km^2 and 206 local authorities with an average population of 12,000 people. The region has its Government and its Parliament. The Administration of Wallonia is composed of two Departments: the Ministry for the Region of Wallonia and the Ministry of Equipment and Transport (MET). The latter has taken the lead to co-ordinate different projects that were emerging, particularly in the area of digital mapping.

In May 1991 the Wallonia Government initiated the **PICC** Project or "**P**rojet **I**nformatique de **C**artographie **C**ontinue" (Computer Project for Continuous Cartography), one of the core elements of the of the emerging geographic information strategy in Wallonia. The objective of this project is to develop a detailed 1:1000 scale map for the whole region, which with hindsight may prove to be such an onerous undertaking as to delay other developments. In order to encourage and facilitate exchanges of information among local and regional administrations, and citizens, the Government of Wallonia decided to create the "***B**ase de **R**éférence des **I**tems **G**éographiques, **I**nformatisée et **T**ridimensionnelle*", **BRIGIT** (Computerised Three-Dimensional Reference Database of Geographic Items), a product realised within the context of the PICC project. This and other related project indicate that there is a momentum now building up in Wallonia in a number of areas. However, there are also significant pockets of inertia as exemplified by the land and property data held by the Cadastral Service which is nowhere near becoming accessible on-line.

Legislation is in force since 1991 regulating access to environmental data (Belgian Monitor on 11th October 1991) and since 1995 in respect to access to public administration (Belgian Monitor on 30th June 1994 and Decree of Wallonia Council of 30th March 1995)

Whilst the picture from federal or regional "central" institutions is therefore mixed, the partnership created by local authorities and utility companies to establish IDELUX (Intercommunale d'Equipment de la Province de Luxembourg), is a very

useful model of bottom-up approaches. The objective of this partnership is essentially to promote local economic development. However, it has quickly become clear that shared geographic information has an important role to play in supporting this objective. Hence, the development of a local data infrastructure building upon, and adding to the data sets available regionally, with the added value of coherent documentation and co-ordination.

Core data: a significant number of "core data" sets are now available, particularly in relation to medium and small scale mapping, road network, and environmental data. Within the IDELUX partnerships, additional data sets include land and property, utility networks, and some of the land-use plans.

Metadata: A number of potentially important projects are under way, but so far only IDELUX has an on-line operating catalogue. The key one by the MET is only in paper format, limiting its usefulness and accessibility.

Co-ordination: a Centre of Coherence has been set up by the Ministry for Equipment and Transport, and projects such as PICC and Brigit are the expression of the co-ordinating efforts being pursued. However, these seem to be focused particularly on digital mapping. Co-ordination of the overall provision of digital geographic data is at present only taking place at the local level within the area covered by IDELUX.

3.   European Projects and Initiatives

GI2000: this initiative has had a chequered history, and the Communication to Council and Parliament that was originally scheduled for 1996 has been postponed several times. The initiative has however contributed to foster the development of a European GI community through the meetings is has sponsored, and the support given to the establishment of EUROGI. It has also paved the way for a number of EU supported GI projects in the INFO2000 and IST programmes. European GI policy development has been defined as a priority item for the year 2000 in the context of the Green Paper on Public Sector Information, with the approval of the Commissioner for Enterprise and the Information Society (former DG XIII). The Mendelkern Report (see above under "France") urges the French government to push for an action on European GI policy during its Presidency of the EC in the second half of the year 2000.

There are several other initiatives that need to be considered in relation to the objectives set by GI2000, i.e. the development of a policy framework for GI in Europe:

- The EC Green Paper on "Public Sector Information a Key Resource for Europe" (http://www2.echo.lu/info2000/en/publicsector/greenpaper.html) was published in January 1999. This paper has major implications for GI given the extent to which public sector information is largely geographic in nature. The responses to the Green Paper have also seen a major input from GI-related organisations (http://www2.echo.lu/info2000/en/publicsector/gp_comments.html), and it is therefore conceivable that the follow-up of this paper will have bearings for GI policies at the European level.

- An Inter-service Committee for GI (COGI) has been established within the EC. Its first meeting on the 16th November was chaired by the Director General of EUROSTAT, giving a measure of the level of support of this initiative. The brief of this group has yet to be made public, but clearly any initiative that helps the Commission develop an internal policy for GI acquisition, use, and dissemination is welcome. A 1997 study on GI-POLICY funded by DGXIII clearly indicated the extent to which developing a clear policy within the Commission, which still is the major user of pan-European GI, was a pre-requisite for discussing the implementation of EU GI policies with member states and national organisations [see http://www2.echo.lu/gi/fr/docarchive/gi-policy.html (The report can be browsed in French but not English)].

- The Joint Research Centre of the European Commission has been playing an increasingly active role in supporting the development of a GI policy. The mission of the centre is "to provide customer-driven scientific and technical support the conception, development, implementation and monitoring of EU policies" (http://www.jrc.cec.eu.int/jrc/index.asp). As such the Centre has operational experience of the complexity of assembling GI relevant to the monitoring of EU policies. For example, to support DG Agriculture, the JRC had to develop a model to forecast yield of crop production. This is turn required 30 years of daily meteorological data across the EU, which needed some 3 years to assemble in view of the copyright and pricing policy variations across the Union. In its work to support several DGs, the JRC has become increasingly aware of the need to develop a GI policy to avoid duplication of data acquisition by different DGs, and also make better use of the data acquired by the numerous GI-related project directly funded by the EC. With this in mind, one of the eleven projects approved for the JRC's Space Applications Institute in the Fifth Framework Programme for R&D, "supports the actions to create a European Geographic Information Infrastructure (EGII) focusing on technical aspects related to Geographic Information (GI) and Geographic Information Systems (GIS)" (http://www.sai.jrc.it/gi_gis.htm).

There are also a number of EC funded projects that contribute towards the goal of developing a GI policy framework across Europe. They include:

ETeMII: Accompanying measure to support the establishment of a European Territorial Management Information Infrastructure. The objective of this project is to help develop a consensus on some of the most important technical issues that are at the base of a European Information Infrastructure, namely reference data, and data access policies, interoperability and standards, and metadata. The project is co-ordinated by GISFORM (Italy) (http://www.gisform.it), and the partners include both European organisations (EUROGI, AGILE, MEGRIN, and JRC), national associations (AFIGEO-France, CNIG-Portugal), the Technical University of Vienna, and private sector organisations (Geobase, OGCE, SICAD, GERE). ETeMII will be accompanied by a parallel project awarded by the JRC's Space Applications Institute to a consortium led by GERE. The project is entitled 'Accompanying measure for the interoperability of Geographical Information Systems in Europe - A technology perspective'. The work includes a feasibility study and business case for a Virtual Interoperability Laboratory in Europe. The partners are GEOBASE, IDELUX and

OGCE with sub-contractors TUV, Universitat Jaume I and Université de Provence. CNIG Portugal and Aerospatiale Matra are sponsors.

The PANEL-GI (INCO-COPERNICUS) project aims at involving partners from the Central and Eastern European Countries (CEEC) in a Pan European GI Forum. The network makes an important contribution towards developing an integrated European GI domain and stimulating GI-related business in the CEEC. Its wider goal is to contribute towards the establishment of shared foundations for the Information Society in the CEEC, with particular emphasis in the area of GIS. (http://gisig.ima.ge.cnr.it/panel-gi). The project partners are: from the European Union (GISIG, EUROGI, JRC-SAI, TU Vienna, CNIG) and from the Central and Eastern European Countries (HUNAGI (H), GISPOL (P), Masaryk University (CZ), ICI (RO), TU Sofia (BG)).

ABDS - The Administrative Boundary Database Service for the CEE countries aims at the preparation and partial implementation of on-line delivery of administrative boundary data collected, processed and delivered with defined rules for data model and products using European and ISO standards. The service will support ongoing data collection actions (eg. SABE, GISCO) and pan European projects including preparations for the accession of CEE countries to the EU.

Metadata Projects:

CLEAR: Spatial Clearinghouse Saar-Lor-Lux (http://www.info2000-clear.org/) (see also http://www.jura.uni-sb.de/clear/fr/index.html for the internet legal desk.
ESMI: European Spatial Multimedia Infrastructure
(http://www2.echo.lu/gi/en/info2000/firstcall/esmi.html)
GEIXS: European multilingual metadata service for the geological surveys
(http://geixs.eurogeosurveys.org/en/geodata.html
http://www.nitg.tno.nl/eurogeosurveys)
GISEDI: Electronic Trade for Geographic Information
(http://www.wrcplc.co.uk/gisedi.htm)
LACLEF: Unlocking GI in the public sector through e-commerce
(http://www.megrin.org/PROJECTS/LACLEF/LaClef.html)
M A D A M E: Methods for Access to Data and Metadata in Europe
(http://www.info2000-madame.org)

These are some of the key projects specifically addressing issues of GI infrastructure and metadata. These projects met on the 7-8 December 1999 to discuss common areas of activity and avoid duplication of effort. Their outputs have the potential to contribute in practical terms to some of the technical and organisational issues underpinning the development of a GI infrastructure in Europe, as well as developing practical guidelines for metadata at the European level.

4.   Discussion and Way Forward

The overview of data policy initiatives presented in this report highlights a number of issues:

1. There are many national initiatives across Europe concerned with the development of data policies in general, and GI policy in particular. In some cases, the GI dimension is very strong, as is the case in Portugal and the Netherlands for example. In others, such as France, GI is recognised as an important element of public sector information, which highlights the potential conflicts between economic and social objectives.

2. Whilst in most countries the emphasis is on the national level, it is important to recognise that in other countries the regional/local dimension is particularly important, as in the case of Germany, Italy, and Belgium.

3. Whilst some country displays a higher level of awareness than others, there is a sense to which the very rapid developments brought about by technology and the Internet, are forcing governments to come to terms with the opportunities and challenges that these developments create. At the present time, most countries seem to have adopted policies in respect to *access* to public sector information. These may in some cases take the form of Freedom of Information legislation. There is however, a quite different set of policies that need developing in respect to a pro-active *dissemination* of public sector information. The Mandelkern report in France is a good example of the difference between access and dissemination.

4. Disseminating information has major implications in respect to the organisation of work in the public administration, intellectual property, metadata (i.e. the first step in active dissemination is to declare what is available), relationships with the private sector, and pricing.

5. In respect to pricing, there are significant variations among the countries analysed above. In some cases there is a distinction between essential data free of charge (i.e. paid for through general taxation), and value added data charged for. In others, a policy has yet to emerge, and individual organisations act independently. Where a policy exists, a general principle that seems to emerge is that whatever the pricing policy, price should not deter use of data but on the contrary should encourage it.

6. Whilst in the last few years there has been an tendency within the GI community to argue for the development of GI policies and infrastructures, it seems increasingly clear that these cannot be pursued in isolation, but need to be couched in a broader debate about data access and dissemination policies. This may also have implications for the GI2000 initiative, and its relationship to the Green Paper on Public Sector Information.

Current developments at the EC level seem to move in the right direction in respect to:

- The establishment of a framework for developing a GI policy within the EC through the Inter-Service Committee COGI,
- The increasing involvement of JRC,
- A greater emphasis by EUROGI on data policy issues.

Areas where further action is needed are:

- Continue monitoring, documenting, and disseminating data policy developments occurring at national/regional level in Europe, and in the international arena. This may include for example NSDI developments outside Europe, and policies on access to remotely sensed data such as those formulated by the UN (http://www.un.or.at/OOSA_Kiosk/treat/rs/rstxt.html). These policies may become particularly important as the impact on data supply of very high resolution remote sensing satellites and the operational Earth observation programme increases.

- Contribute to the debate not only by observing practice but also through theory-informed discussions on appropriate legal and economic frameworks to the dissemination of digital information. A useful discussion on data pricing took place earlier this year in the GI2000 discussion list, while CERCO's WG1 on legal and economic issues will discuss next year "Public Information vs. Privacy Protection". Research in this area is also taking place at different locations (e.g. TU Vienna), and EC-funded projects (e.g. MADAME) and there is a clear need to capitalise on these initiatives.

- Develop a framework to inform the policy developments within the Commission (COGI, DG Information Society, other DGs not equally aware of the issues), and at national/regional levels so that effective communication takes place across Europe.

- Link GI policy initiatives to the wider debates on data policy (e.g. Green Paper) and other major policy initiatives at the EU level such as enlargement, agricultural policy, spatial development perspective, so that a stronger case for European action can be developed.

DISCLAIMER:

The views expressed in this report are those of the author alone and do not necessarily represent either those of the participants in the meetings or the organisations they represented.

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G.Remetey-Fülöpp, Gábor - Zs.Sikolya, 1998: Case study of NSDIs in countries in transition - Hungary. Paper presented at the *3rd GSDI Conference*, 17-19, 1998, Canberra devoted to the Policy and Organisational Framework for a GSDI. www.eurogi.org/gsdi/canberra/hunagi.html

P. Kardeván 1998: Report on The ISPRS Inter-Commission Workshop On "GIS, Airborne Remote Sensing And Geospatial Clearinghouse" February 19-20, 1998 Budapest, Hungary . In ISPRS Highlights. http://wwww.isprs.org/publications/annual_reports/report98/

Additional Links for Germany:

federal:
http://www.adv-online.de/index.htm AdV - The Federal & State Survey Agencies of Germany
http://www.adv-online.de/mitglieder/liste.htm AdV - Address list of State Surveys
http://www.adv-online.de/neues/oinhalt.htm AdV - Geodata object modelling
http://www.bgr.de/index.html BGR - The Federal GeoRessources Agency
http://virgo2000.zgdv.de/ VIRGO Visualisation Interface for Regional Geological Objects
http://www.bmv.de BMV – The Federal Ministry of Transport
http://www.bundesregierung.de/02/0201/innen/ BMI – The Federal Ministry of Interior
http://www.bundeswehr.de/milgeo/index.html MilGEO - The Federal MilGEO Agency
http://www.cityguidefinder.de/start.htm The German CityMapFinder Server
http://www.ddgi.de/ DDGI – The German Association of GeoInformation
http://www.dfd.dlr.de/index.html DLR - The Federal Space Research Agency
http://www.dfd.dlr.de/products/latest.html.en DLR - The latest satellite images from DFD
http://www.dstgb.de/ DStGB – The German Association of Communities
http://www.dvw.de/ DVW – The Association of German Surveyors
http://www.entry.de/ DFN – The Entry Point of German Webserver Maps
http://www.gfz-potsdam.de/welcome_en.html GFZ - GeoResearchCenter
http://www.giscad.com/ GISCAD –Rasterdata Supply
http://www.gis-tutor.de/ The Internet & GIS Tutorial Project
http://www.ifag.de/BKG/bericht.htm The IMAGI Report of Geodata Integration
http://www.ifag.de/welcome-e.html BKG - The Federal S&M Research Agency
http://www.ingeoforum.de/ InGeoForum – Regional GI Association in Hessen
http://www.reiseplanung.de/RS/RSEuropaForm.asp European Map Routing Online
http://www.reiseplanung.de/RS/RSForm.asp German MapRouting Online
http://www.sicad.de/ SICAD-Geomatics
http://www.sicad-utilities.de/index.htm SICAD Utilities
http://www.staat-modern.de/ Governmental Modernization Programs for Germany
http://www.staedtetag.de/ The Association of German Cities
http://www.statistik-bund.de/e_home.htm The Federal Statistical Agency of Germany
http://www.umweltbundesamt.de/ UBA – The German Environmental Agency
http://www.uni-leipzig.de/ifl/national/cd/index_cd.htm German National Atlas Project
http://www.varta-guide.de/ The Accomodation, Mapping & Navigation Site of FRG
http://www.vdv-online.de/ VDV - Association of German Surveying Engineers
http://www.vdv-online.de/geolist.htm VDV - The Geoinformation Homepage of VDV
http://www.yellowmap.de/GemeindeNav/HTML/frames.asp Infoserver for German Communities

regional: (examples)
http://www.bgr.de/geol_la/geol_la.htm Adress lists German State Geological Surveys
http://www.ioez.tu-freiberg.de/ The Interdisciplinary Ecological Research Center at TUBAF
http://www.lgn.de/ The State Geoinformation Survey of Lower Saxonia
http://www.lv-bw.de/praes.htm The State Survey of Baden Wuerttemberg (Product Presentation)
http://www.lverma.nrw.de/ The State Mapping Survey of North-Rhine Westfalia
http://www.lvsn.smi.sachsen.de/ The State Mapping Survey of Saxony
http://www.sachsen.de/english/index.html/ The Free State of Saxony Online
http://www.statistik.sachsen.de/englisch/index.htm The State Statistics Survey of Saxony
http://www.statistik.sachsen.de/35lis/lis.htm The State Statistics Information System of Saxony
http://www.tu-freiberg.de/fakultaeten.html The Faculty of GEO-Sciences at TUBA-Freiberg

local: (examples)
http://www.dresden.de/ The City of Dresden Online
http://www.dresden-stadtplan.de/ The Local Geodata (Image) Server of Dresden City
http://www.telemap.de/ German City Maps Online
http://www.yellowmap.de/ Information Navigator for German Communities

Appendix 1:**List of participants in the Data Policy Workshop 15 November 1999**

Ian Masser,   President of EUROGI
Anton Wolfkamp   Secretary General of EUROGI
Bas Kok   RAVI
Jaap Berends   RAVI
Laila Aslesen   CERCO Working Group on Legal Issues
Gabor Remetey-Fulopp   HUNAGI
Max Craglia   AGI
Josef Strobl   AGEO
Dr Krysia Rybaczuk   Department of Geography at Trinity College Dublin
Luigi DiBello   Technical Coordination Committee Italy
Bertrand du Marais   French Planning Directorate
Ad Bastiaansen   Director Business Development Tele Atlas
Jan Jellema   EuroGeoSurveys (GEIXS)
Allessandro Annoni   JRC
Jean Meyer-Roux   JRC
Torbiörn Carlquist   GISCO/Eurostat
Martin Littlejohn   DGXIII
Frank Hoffmann   BOW - Bildungszentrum Dresden
Alenka Krek   Geoinfo. TU Wien
Antti Vertanen   ProGIS
Antii Kosonen   ProGIS
Yves Reginster   ETeMII