



INSPIRE
(Infrastructure for Spatial Information in Europe)

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Executive Summary

This report is about the progress made in the implementation by the Republic of Cyprus of Directive 2007/2/EC (INSPIRE), after it was transposed in Cyprus law by the enactment of Law N.43 (I) / 2010 and relates to the period from 2010 - 2012 (inclusive).

It was prepared in accordance with the provisions of the Directive and Commission Decision No. 2009/442/EC. It used to the maximum extent possible the standard reporting model proposed by the INSPIRE Group of the EU and the instructions and the directions given from time to time at European level.

It should be noted that the case of Cyprus, the implementation of the INSPIRE Directive has a peculiarity. A very large part of the infrastructure for geospatial information has already been developed within the establishment and functioning of the Integrated Land Information System at the Department of Lands and Surveys. The system was designed in such a way as to operate and meet both the internal needs of the Department of Lands and Surveys, as well as the needs of other Departments, Ministries, Services and individuals. This system has been operating on an island-wide basis since 1997.

The Land Information System is continuously updated and upgraded from time to time to keep up with the evolution of technology and also to meet new needs. There are geospatial data covering the whole country at various levels of information and with various accuracies. Direct access to data is given to other Government Departments either through the Government node or through web services. Additionally, digital geospatial data are provided on a daily basis to any interested party on payment of the prescribed fees. Government agencies and departments do not pay any fees.

The national infrastructure for spatial data continues to grow and all necessary measures are being taken in order to achieve interoperability and full compliance with the regulations and technical standards adopted for the development of the corresponding European infrastructure.

1 Abbreviations & Acronyms

GIS	Geographical Information System
PA	Public Administration
PAs	Public Authorities
IMT	INSPIRE Management Team
EU	European Union
LPGPL	Legal person governed by public law
Law N.43(I)/2010	The creation of the infrastructure for spatial information (INSPIRE) Law of 2010
WG	Working Group
INSPIRE Directive	Directive 2007/2/EC
IMC	INSPIRE Management Council
LIMC	Land Information Management Council
LIS	Land Information System
DLS	Department of Lands and Surveys
DE	Department of Environment
DITS	Department of Information Technology Services
MI	Ministry of the Interior

2 Introduction

2.1 Background

The INSPIRE Directive was transposed in the national law of the Republic of Cyprus with the enactment of Law N.43 (I) / 2010 on 14 May 2010 (see Official Gazette No.4241).

The particular feature of Cyprus compared to other EU member states was that by that time a large part of geospatial information infrastructure had already been developed which was stored in the databases of the Land Information System (LIS) of the Department of Lands and Surveys. The old technology used, the storage method and data interface as well as the operation of the LIS in a truly online environment did not make easy the immediate compliance with the requirements of the Directive on a technological, administrative and institutional level. Furthermore, the serious economic crisis plaguing Cyprus in recent years has made this task even more difficult.

Until recently, the geospatial information produced at the LIS was based on standards that were developed and adopted in the 1990s.

It should be noted that the Department of Lands and Surveys is the official Land and Cartography Organisation in Cyprus. The geospatial information generated relate to cadastral, mapping, surveying, geodetic, photogrammetry and other information, which comply with common rules and technical specifications. Uniform projection systems and coordinates are used which make the interface of geospatial information easier.

The Republic of Cyprus since 1986 has recognized the need for a single infrastructure of geospatial data and for this purpose it entrusted Australian experts with the task of preparing the relevant study. This study was prepared and submitted in 1987. The main recommendations of the study included the digitization of spatial and non-spatial information and the creation of an Integrated Land Information System (LIS). It was followed by the preparation of a detailed strategic plan and specifications. Following the invitation of international tenders, a consortium of companies was awarded the design and development of the LIS. At the same time, the task of digitizing all of the necessary information started. The LIS came into operation in 1997, and today operates in an environment of SUN / Solaris, Oracle and ArcInfo / ESRI. This system at times underwent various changes and upgrades.

By Council of Ministers decision No. 41.657 dated 13/10/1994, a Land Information Management Council (LIMC) was established, which is chaired by the Permanent Secretary of the Ministry of Interior and ten other members representing key ministries, government departments and large organizations of the broader public sector.

In May 1995 the LIMC submitted and approved a Strategic Plan for the development and management of the Land Information System of Cyprus. The main recommendations of the Strategic Plan included the complete computerization of records, plans, maps and procedures of the Department of Lands and Surveys, the carrying-out of new land surveying using modern methods, the development of a LIS and the gradual development of an integrated Land Information System in Cyprus, with cooperation and participation of a number of government departments, public utilities, local authorities etc.

It became evident at that time that the creation of the Land Information System at the Department of Lands and Surveys was a very complex and challenging task. Despite this, the system was designed, developed and put into operation in 1997.

The involvement and participation of other government departments and agencies in the creation of an integrated geospatial data infrastructure was quite difficult and much more time consuming than initially estimated. Gradually, other peripheral systems were created and a large volume of digital information was collected. Much of the data generated were based on the infrastructure for geographical data of the Department of Lands and Surveys and the same projection system and coordinates were adopted. Other systems have followed their own specifications, in order to meet quickly specific internal needs, with the result that there is no compatibility.

The Ministry of Interior of the Republic of Cyprus has taken on a coordinating role in the implementation of the INSPIRE Directive in Cyprus, while the Department of Lands and Surveys, the Department of Information Technology Services and the Department of Environment, have taken a leading role in organizing and implementing the Directive.

For this purpose, the House of Representatives in 2010 passed the Creation of the INSPIRE Infrastructure for Spatial Data Law N.43 (I) / 2010. The law aimed at harmonisation with Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007, establishing an infrastructure for geospatial information/data area on which Cyprus has and/or exercises jurisdiction. It also contains provisions relating to the availability, quality and organization of information, access to it and sharing it.

2.2 Reporting Methodology

In line with what has been mentioned above, this report includes the relevant actions which have been implemented over the period 2010-2012(inclusive). Additionally, reference is made to the planned activities and the way in which they are expected to solve the current problems.

The sources used in the preparation of this report are the following:

- Collection of information on the geospatial data and services sustained by public authorities (PAs) in the country.
- Collection of information through direct communication with the agencies concerned.
- The content of the annual report is designed to collect all the information required for the preparation of this triennial report

3 Coordination and quality assurance

3.1 Coordination

3.1.1 Contact point of Member State

According to Article 5 (3) (a) (i) of Law N.43 (I) / 2010, the Management Council has jurisdiction to appoint the national contact point of the Republic of Cyprus with the European Commission on matters relating to the implementation of the Law.

3.1.1.1 Contact details of the Contact Point

Contact Point of the Member State	
Name of Public Authority	Ministry of the Interior
Contact details:	
Postal Address	<i>Demosthenes Severis Avenue, 1453, Nicosia Cyprus</i>
URL of organisation's website	www.moi.gov.cy
Contact Persons	Andreas Hadjiraftis, Secretary IMC and Contact Point Anthi Koukkouri-Lakkotrypi, Representative of the Ministry of Interior
Telephones ^a	(+357) 22 447909 (+357) 22 867813
Fax	(+357) 22 769694 (+357) 22 867872
Email	ahadjiraftis@dls.moi.gov.cy alakkotrypi@dls.moi.gov.cy

3.1.1.2 Role and Responsibilities of the Ministry of Interior

The Ministry of the Interior as the Ministry of the citizen par excellence formulates and implements a policy focused on the citizen. This policy is shaped through various actions. The anthropocentric activities of the Ministry of Interior are based on the following policy components:

1. Improving the quality of services provided to the citizen, who is the main pillar of its policy, with particular emphasis on securing and consolidating meritocracy, objectivity, good governance and transparency.
2. Easing the housing problems of displaced and afflicted persons, as well as of the economically weaker classes of people, through the application of new housing projects which came into force on 1.1.2007.
3. Enhancing the role and restructuring of local government through the systematic and gradual broadening of its powers, while ensuring financial autonomy in order to enable it to cope effectively with contemporary demands, and to contribute effectively to the collective effort of the state in developing both urban and rural areas. Promoting a range of measures to support rural areas and providing economic incentives to encourage collaboration and clustering between local authorities and other local agencies.
4. Intensifying efforts to modernize and simplify procedures, which prove to be insufficient to meet the current demands and needs of citizens, and hold back key areas of competence of

the Ministry (Town Planning, Land Registry, Migration, Asylum, etc.) with a concomitant decentralization of powers, as close to the citizen as possible.

The following departments and services come under the Ministry of the Interior:

1. The District Administrations of Lefkosia, Keryneia, Ammochostos, Larnaka, Lemesosl and Pafos
2. The Department of Lands and Surveys
3. The Town Planning and Housing Department
4. The Civil Registry and Migration Department
5. The Asylum Service
6. Civil Defence Department
7. The Press and Information Office
8. The Service for the Care and Rehabilitation of Displaced Persons
9. The Service for the Management of Turkish Cypriot Properties

The Ministry of the Interior supervises:

1. Semi-state organisations (the Cyprus Broadcasting Corporation, the Cyprus News Agency, the Cyprus Land Development Organisation, the Wildlife Fund and the Cyprus Radio-television Authority)
2. The Sewerage Boards
3. The Board for the Examination of Departure Applications
4. The Town Planning Board
5. The Water Boards

3.1.1.3 The Role and Responsibilities of the Department of Lands and Surveys

The Department of Lands and Surveys plays a very important role in the creation of the geospatial data infrastructure.

The Department of Lands and Surveys is the competent government department that provides services in relation to rights in real property, conducting surveying operations, managing the geodetic network and surveying data, mapping, registration, transfer and mortgage of property, land tenure, valuation of real property and the management of state land. In general, most activities of the Department revolve around property ownership and the management of geospatial data.

Moreover, the Department of Lands and Surveys, through the Cartography Branch, which is Cyprus' official Cartography Organisation, prepares road, topographical, administrative, tourist and other maps, prepares digital and conventional data to meet the needs of other organisations and services, participates in pan-European projects, provides consulting services and officially represents Cyprus at European, and international cartographic organizations.

The Department of Lands and Surveys has developed and has been using for almost 16 years now the integrated Land Information System (LIS), which meets its key objectives and tasks. Thanks to this system, immovable property transactions have been computerised and the methods and procedures used in all Branches have been simplified and automated, increasing productivity and significantly improving the quality of service provided to citizens.

The Department of Lands and Surveys has offices and provides services in all the Districts of Cyprus. The Department of Lands and Surveys, in the framework of its activities, apart from serving the public, businesses and various organizations, has been carrying out two major development programs:

- (a) The Data Collection work, Processing and Classification Data in the Land Information System (LIS) and
- (b) The Re-resurveying Project.

The task of Collection, Processing and Classification of data, aims to introduce the necessary cadastral, appraisal and geographic data in the LIS, so that it can work effectively for all areas of Cyprus (free and occupied). The Re-Surveying Project aims at making a new surveying throughout the island and at preparing new digital, highly accurate and reliable cadastral plans, which will be the geographical databases of the Land Information System in Cyprus.

Along with the above mentioned programs, the Department has undertaken the re-design and upgrading of all its standard cartographic series. In this context, the Department has secured suitable mapping software, Geographic Information Systems (GIS) and equipment, and has trained the necessary personnel. Already most of the maps of the Department have been processed and upgraded with digital processes and are available in vector format and in raster format. The data generated are already used by other departments and services as basic cartographic infrastructure and support a variety of geographic applications (GIS) and other needs. At the same time, geographic data concerning Cyprus are processed, and the Department participates in pan-European databases such as:

- the EuroBoundary Administrative units and boundaries database
- the EuroGlobal Map database,
- the EuroRegional Map database,
- the EuroGeoNames (geographical names) database
- and EuroDEM (Digital Elevation Model) database

With the implementation and operation of the Land Information System, the following benefits have accrued:

1. Continuous digital databases have been created which cover the whole of Cyprus and provide complete geospatial information for any region.
2. By linking the digital databases the storing of information more than once is avoided, inaccuracies are eliminated, thematic maps are prepared, there is uniform data analysis for proper decision-making, etc. It became feasible to synchronize the geographical, legal and appraisal data. This issue is a prerequisite for the credibility of the three sub-systems and by extension of the Land Information System.
3. Questions can be submitted to the system, combining all databases of the LIS, taking results in a spatial (graphic) format and in textual format within very short periods.
4. Calculations of the areas and regions can be made automatically and with greater accuracy and speed, compared to the time consuming manual methods.
5. Cases of land division, merging of parcels, readjustment of boundaries etc. can be completed much more quickly, while the updating of the databases and the cadastral plans is made automatically.
6. The preparation and redesign of the entire series of cadastral plans can be made at very short intervals and at any scale.
7. Thematic maps at any scale can be composed very quickly.
8. The update of cadastral plans is made automatically.
9. There are many checks for accuracy and quality, with the result that the final products excel in all respects.
10. The Digital Cadastral Database is used as a guide and method of comparison of data for the project of re-surveying.
11. The Digital Geographic Database can quickly and efficiently supply with data other organizations, government departments and the private sector. In this way these organizations can update their databases much more quickly and easily.
12. By providing digital geographical data to other organisations, the exchange of geographic information in digital format can be made much more effectively than hitherto and what is more, with uniform accuracy. This will help immensely the rapid establishment of a National Land Information System, which is the ultimate goal of the Government, in accordance with the Strategic Plan prepared by Australian experts.

13. The Digital Geographic Database helps to extract data from aerial photographs, since it allows the automatic comparison of the cadastral plan on screen, at the time the information is being collected. This greatly helps in taking fast and accurate decisions on the spot, while the collection of information is going on, saving in this way considerable time.
14. The Geographic Database can receive data from the re-surveying project through the Survey Database, regardless of whether the same area has been covered in the digitization.
15. Many employees of the Department have been involved in the development process of the LIS and have acquired specialized knowledge and experiences. The combination of knowledge, experience and capabilities provided by the system, allows the quick service, the upgrading of services to the public and the preparation of new products.
16. The adoption of new standards and their application in the operation of the LIS allows the harmonization and data exchange between the Department and European organizations with which the Department has been cooperating for a long time.

The spatial data infrastructure in Cyprus is mainly based on the progress that has been made in the various projects implemented by the Department of Lands and Surveys:

1. Development of the Integrated Land Information System (Geographic, Survey, Topographical, Cadastral and Valuation databases)
2. Establishment of a geodetic network having high accuracy.
3. Digital database of satellite images
4. Digital aerial orthophotos database.
5. Digital database of town-planning zones.
6. Digital database of Protected Areas – Natura 2000 network.
7. Digital Road Network database.
8. Digital Postal Regions Database.
9. Digital image database geospatial referenced (building facades and details of roads) along axes of the road network (wider urban area of Nicosia).
10. Re-surveying and re-mapping.
11. Updating and Upgrading of existing cartographic series.
12. Developing a multidisciplinary website allowing further development of online applications
13. Upgrading of LIS.

3.1.2 Administration and coordination structure – Management Council

The Ministry of the Interior of the Republic of Cyprus, based on the Law N.43 (I) /2010, has undertaken a coordinating role in the implementation of the INSPIRE Directive in Cyprus, while the Department of Lands and Surveys, the Department of Information Technology Services and the Department of Environment have undertaken a leading role in its organisation and implementation.

Under the new legislation, provision is made for the creation of a Management Council, a Management Team, Technical Committees and Working Groups, as shown in detail in the following diagram:

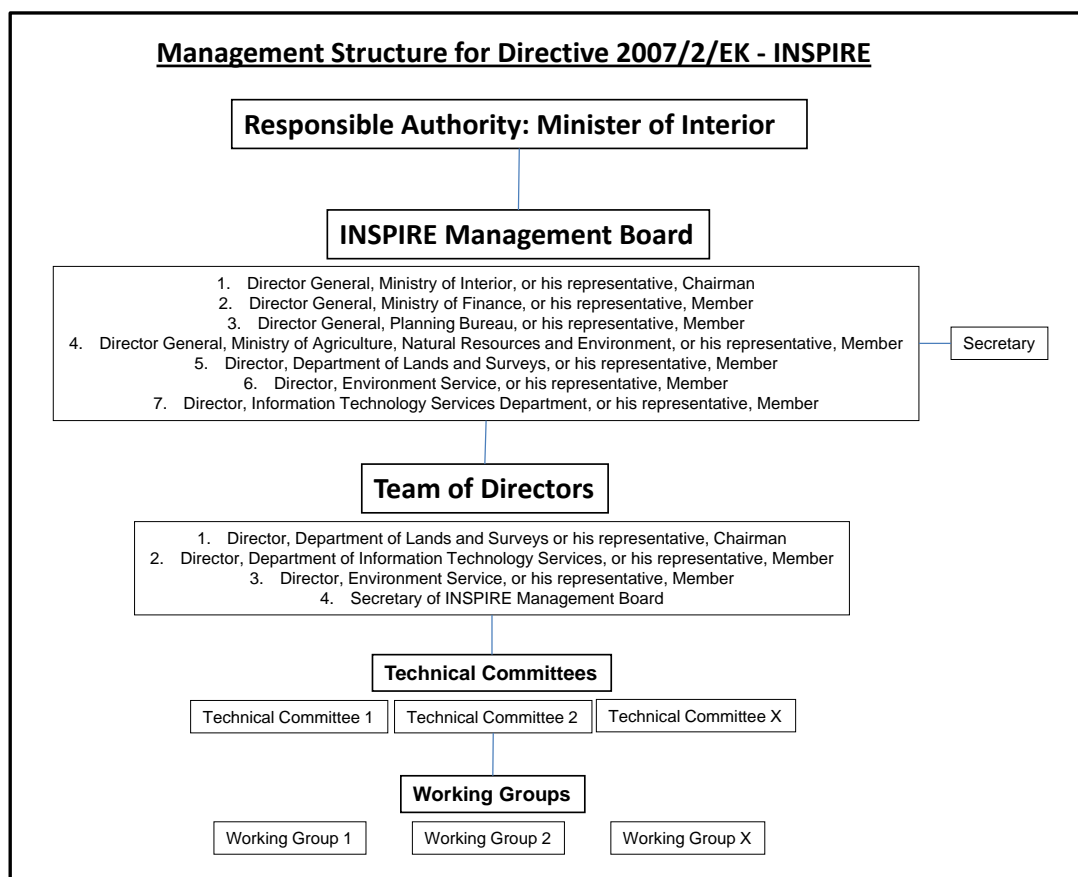


Diagram 1.1: Management Structure of INSPIRE Directive in Cyprus

The powers and functions of the INSPIRE Management Council include:

- (i) Appointment of the Contact Point of the Republic with the European Commission on matters relating to the implementation of this Law,
- (ii) Evaluation and approval of the positions of the Republic in the relevant bodies of the European Commission, where it is represented by the Contact Point,
- (iii) Review and approval of all information, reports and data before their submission to the European Commission,
- (iv) Consideration of issues of internal coordination between the Competent Authority and other government departments concerned,
- (v) Submission of recommendations to the Competent Authority for the smooth implementation of this Law, and
- (vi) Submission of proposals for the issuing of Regulations under the provisions of Article 20, for the smooth implementation of this Law.

The Management Team has the responsibility to:

- (α) Set up special technical committees, subcommittees and working groups on specific issues and to determine the terms of reference, and
- (β) Invite to any of its meeting any officer of a public authority and any person whose views or specialized knowledge concerning a particular topic may be deemed useful or

necessary for its work.

3.1.2.1 Nominations and contact details of agencies responsible for the management and coordination of the INSPIRE program

INSPIRE Management Council	
1. Chairman of the Council	Permanent Secretary of the Ministry of the Interior
Contact details:	
Postal Address	Ministry of the Interior Demosthenis Severis Avenue, 1453, Nicosia Cyprus
URL of the organisation's website	www.moi.gov.cy
Contact persons	Andreas Hadjiraftis, Secretary IMC and Contact Point Anthi Koukkouri-Lakkotrypi, Representative of the Ministry of Interior
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Fax	(+357) 22 769694 (+357) 22 867872
Email	ahadjiraftis@dls.moi.gov.cy alakkotrypi@dls.moi.gov.cy
2. Member	Permanent Secretary of the Ministry of Finance
Contact details:	
Postal Address	Ministry of Finance, <i>Corner of Michael Karaolis & Grigoris Afxentiou</i> 1439 Nicosia Cyprus
URL of the organisation's website	www.mof.gov.cy
Contact Person	Mrs Ifigenia Petrocosta, Representative of the Permanent Secretary
Telephones	(+357) 22 601128
Fax	(+357) 22 602760
Email	ipetrocosta@mof.gov.cy
3. Member	Permanent Secretary Directorate General for European Programmes, Coordination and Development (ex Planning Bureau)
Contact details :	
Postal Address	Directorate General for European Programmes, Coordination and Development 29 Byronos Avenue 1409 Nicosia, Cyprus

URL of the organisation's website	www.planning.gov.cy
Contact Persons	Mrs Stella Zapiti, Representative of the Permanent Secretary
Telephones	(+357) 22 602837
Fax	(+357) 22 666810
Email	szapiti@planning.gov.cy

4. Member	Permanent Secretary of the Ministry of Agriculture, Natural Resources and Environment
Contact details:	
Postal Address	Ministry of Agriculture, Natural Resources and Environment Louki Akrita 1411 Nicosia, Cyprus
URL of the organisation's website	www.moa.gov.cy
Contact Persons	Mr. Charalambos Hadjipakkos, Representative of the Permanent Secretary of the Ministry of Agriculture, Natural Resources and Environment Department of Environment 20-22, 28 th October Street 1498, Nicosia, Cyprus
Telephones	(+357) 22 408927
Fax	(+357) 22 774945
Email	chajipakkos@environment.moa.gov.cy

5. Member	Director of the Department of Lands and Surveys
Contact details:	
Postal Address	Department of Lands and Surveys 29 Michalakopoulou street, 1455 Nicosia, Cyprus
URL of the organisation's website	www.moi.gov.cy/dls
Contact Persons	Andreas Hadjiraftis, Representative of the Director and Secretary of IMC
Telephones	+357 22 804900, +357 22 447909
Fax	+357 22 804881, +357 22 769694
Email	director@dls.moi.gov.cy , ahadjiraftis@dls.moi.gov.cy

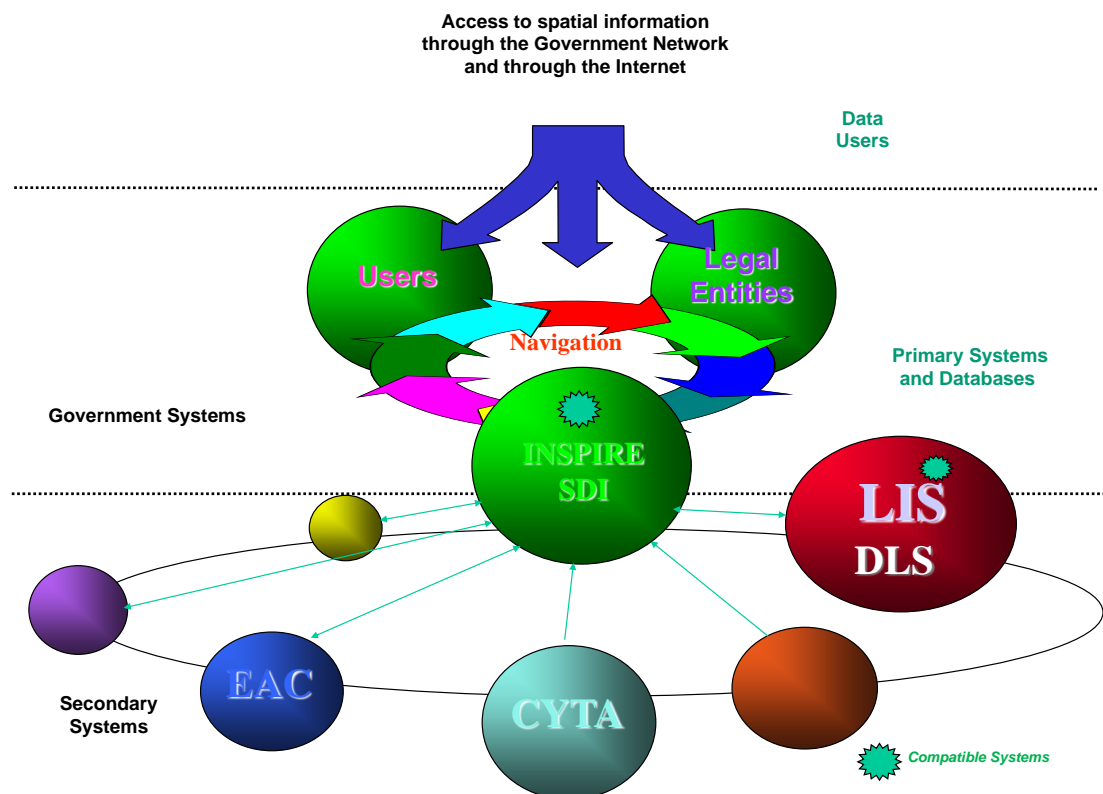
6. Μέλος	Director of the Department of Environment
Contact details:	
Postal Address	Department of Environment 20-22, 28 th October street 1498 Nicosia, Cyprus
URL of the organisation's website	www.moa.gov.cy/environment/
Contact Persons	Mrs Nasia Dikigoropoulou, Representative of the Director
Telephones	(+357) 22 408924

Fax	(+357) 22 774945
Email	ndikigoropoulou@environment.moa.gov.cy
7. Member	Director Department of Information Technology Services
Contact details :	
Postal address	Department of Information Technology Services Corner of Michael Karaoli & Grigoris Afxentiou 1446 Nicosia, Cyprus
URL of the organisation's website	www.mof.gov.cy/dits
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Email	cagrotis@dits.mof.gov.cy director@dits.mof.gov.cy mconstantinidou@dits.mof.gov.cy

3.1.2.2 Information Flow diagram - INSPIRE

The following diagram describes the correlations of key actors involved in the development and operation of the infrastructure for spatial data (INSPIRE):

INSPIRE – Spatial Information Flow Diagram



3.1.3 Procedures for monitoring the implementation of the INSPIRE Directive and reporting

For the monitoring of the implementation of the INSPIRE Directive and Law N.43 (I) / 2010 and for reporting, the Ministry of Interior will use the following:

Monitoring the implementation of the INSPIRE Directive

- **Catalogue (Register) of Geospatial Data:** This catalogue will contain information on sets of geospatial data and the geospatial services produced and maintained by the competent institutions of the country. The information contained in the Catalogue will include all the search metadata envisaged in the INSPIRE Directive.

The catalogue will be generated by the Interior Ministry and will be completed under the responsibility of the organisations involved. It will be updated annually.

Reporting

- Annual reports prepared by the Ministry of the Interior.
- Annual reports prepared by the organizations concerned and sent to the Ministry of the Interior. For the preparation of these reports, an appropriate model drawn by the Interior Ministry, which aims to facilitate the gathering of information required by Law N.43 (I) / 2010 and the INSPIRE Directive, is used.

To evaluate the actions of the Ministry of Interior and the response and compliance of the Public Administration with the provisions of the law and the Directive, the Ministry of the Interior may conduct other surveys using properly prepared questionnaires.

The activities carried out on each of the above actions are analysed in the following paragraphs.

3.1.3.1 Procedures and measures for the monitoring of the INSPIRE Directive

- Catalogue (Register) of Geospatial data

One of the major problems identified in Cyprus, in relation to the national infrastructure of geospatial information, was the lack of an integrated record of the geo-information generated. Creating this Catalogue was one of the first actions undertaken by the Ministry of Interior for the INSPIRE Management Council.

The need for the preparation of a first catalogue emerged on the one hand because there had to be a picture of the issues to be dealt with by the law, and on the other hand because there was a deadline for implementation of the INSPIRE Directive concerning reporting and the calculation of indicators for the monitoring of its implementation. This action has resulted in the creation of the first Catalogue of geospatial data and services. The list and the indicators for the monitoring of the Directive were derived from the processing of this Catalogue.

3.1.3.2 Procedures and measures for the compilation of reports on the implementation of the INSPIRE Directive

In accordance with Article 5- (3) a (ii), of Law N.43 (I) / 2010, the Management Council shall evaluate and approve all information, reports and data before they are submitted to the European Commission.

The Ministry of the Interior submits to the IMC a report with concise descriptions of the following information:

- the manner of coordination among the providers in the public sector and the users of sets and geospatial data services and intermediaries, as well as a description of the relation with third parties and the organisation of quality assurance,
- the contribution made by public authorities or third parties in the operation or coordination of the geospatial data infrastructure,
- information on the use of geospatial data infrastructure
- agreements on the exchange of geospatial data among public agencies,
- cost and benefit from the implementation of Law N.43(I)/2010.

Every three years the Ministry of the Interior submits to the EU a report approved by the IMC with the necessary data and in accordance with decision 442/2009/EC.

3.2 Quality assurance

3.2.1 Quality assurance procedures

Currently no integrated system of quality assurance procedures which are required for the operation and maintenance of geospatial data infrastructure is applied.

The Department of Lands and Surveys applies a series of quality assurance standards in the framework of data collection and the update of the Land Information System, as well as of other databases. A project is currently under way at the Department of Lands and Surveys and other departments, which is being coordinated by the Department of Public Administration and Personnel. This work is being carried out by the Price Waterhouse Coopers (PWC) firm and aims to prepare a study which makes a detailed record of all the processes used and will make recommendations for the simplification of the institutional framework and for the simplification of procedures and for preparation for the ISO system.

In addition to the above, the Ministry of the Interior is preparing recommendations to the INSPIRE Management Council for the award of a tender for the preparation of a comprehensive Strategic Plan for the implementation of the INSPIRE program in Cyprus. The Strategic Plan is expected to include provisions for establishing a quality assurance system.

3.2.2 Analysis of quality assurance problems

It is not possible at this stage to identify the problems relating to quality assurance procedures as the relevant procedures have not yet been applied. Relevant suggestions will be made by the PWC firm, when the necessary planning is made.

3.2.3 Measures to improve quality assurance

Due to the non-implementation for the time being of a quality assurance system, no specific measures are taken to improve it. However, measures to improve the quality of the individual systems are being taken.

An example of this is the effort currently being made to upgrade the existing Land Information System. To this end, an agreement was signed between the Department of Lands and Surveys and HSDData, a local IT firm with foreign partners from Europe (GEODAN and KPMG). In the framework of this project a comprehensive Strategic Plan and the tender documents for the development of a new integrated Land Information System as well as the development of the infrastructure for geospatial and other data and the implementation of a pilot program will be prepared.

3.2.4 Mechanisms for quality certification

As mentioned earlier, a project is currently under way at the Department of Lands and Surveys and other Departments, which is coordinated by the Department of Public Administration and Personnel. The project is being carried out by the Price Waterhouse Coopers (PWC) firm and aims to prepare a study which makes a detailed record of all processes as well as suggestions for the simplification of the institutional framework and for the simplification of the procedures being followed and will be preparing for the implementation of ISO.

Additionally, in the framework of the Strategic Plan for the development of a new Land Information System, provision will be made for introduction of new quality certification mechanisms.

4 Operation and coordination of geospatial information data.

4.1 General description of geospatial data infrastructure

The creation and operation of infrastructure for geospatial data is provided for in Law N.43 (I) / 2010, which is the institutional tool for the development of a technological, legal and administrative framework under which the geo-information produced in the country based on the principles of interoperability is shared among public authorities and third parties (public, businessmen, academia, etc.) under an integrated and familiar framework.

The provisions of Law N.43 (I) / 2010 envisage the maintenance and operation of an integrated geospatial information infrastructure based on the following principles:

- the data are produced, stored and are made available at the most appropriate level,
- the combination of the utilisation of spatial data and services from different systems, different users (humans or applications) in a coherent manner is feasible,
- the data generated by PAs at any government level are shared among all levels of the Public Administration,
- the geospatial data become available under conditions which do not restrict their further use,
- the geospatial data become easily searchable and allow the evaluation of their suitability in the context of the specific use,
- the applicable terms for their use are well known.

The Ministry of the Interior is the body responsible for the development and operation of the infrastructure for geospatial information for the parties involved and for providing tools, guidelines and technologies that will facilitate participation and interoperability, as well as for communication with the EU on the participation of Cyprus in the European INSPIRE infrastructure.

The national infrastructure for geospatial information concerns all the information generated in the country by public authorities, which is related directly or indirectly with space and is in analogue or digital form.

A subset of the data sets and the corresponding services of this infrastructure falls in the scope of the INSPIRE Directive. These data, as envisaged in Article 4 of the Directive, concern a geographical location in the jurisdiction of an EU member state, are kept by or on behalf of PAs, are in digital form and concern to one or more of the thematic categories of Annexes I, II & III of the INSPIRE Directive. Law N.43 (I)/ 2010 has transposed the INSPIRE Directive as a whole and has national coverage (institutional and territorial).

Access to the data will be done through interoperable services, which will be developed on the basis of the recommendations to be made soon to the Strategic Plan that will be prepared.

Access to data and services of the national infrastructure for geospatial information for the end user will be done through the National Geoportal and through the corresponding European Geoportal. To make better use of modern web technologies, the services will have standardized interfaces, will be self-descriptive and searchable, so that they can be retrieved and used by other applications and web services.

The technological interoperability standards that will apply to the sharing of spatial data sets and corresponding services will be included in the Strategic Plan and the related specification documents to be prepared. These documents will ensure compliance with the specifications given in relation to the implementation of the INSPIRE Directive. The rules governing the production, maintenance, quality assurance, common use, sharing, further use, and - where applicable - the billing of public geoinformation will be determined by the IMC, which will ensure compliance with the respective rules governing the sharing and reuse of geoinformation, which falls within the scope of the INSPIRE Directive.

The Strategic Plan for the implementation of the INSPIRE Directive is expected to be ready in the first half of 2014. It will be followed by the basic design of the National Geoportal and then its initial operation. The operation of the National Geoportal will be compatible and consistent with the Geoportal of the Department of Lands and Surveys, the design of which is in progress. By that time, measures will continue to be taken by the IMC for gradual compliance with the provisions of INSPIRE Directive. These measures among others include:

- Creating and maintaining a catalogue of geoinformation, from which the indicators for monitoring implementation of the INSPIRE Directive will be derived,
- Establishing web search and displaying services for geospatial data sets, in accordance with the requirements of INSPIRE Directive under the Geoportal of the Department of Lands and Surveys,
- Issuing a decision by the IMC on the measures to be taken for the implementation of the common use and further use of public geospatial data, based on the recommendations to be included in the Strategic Plan,
- Ongoing support, monitoring and evaluation of the operation of existing infrastructure for geospatial data in connection with implementation of the law and the Directive.

The involvement of PAs - data producers- in the first pilot web services for spatial data is very limited. Already a web application (<http://parcel.dls.moi.gov.cy/>) has been created, which is accessible in the website of the Department of Lands and Surveys (www.moi.gov.cy/dls).

The application has been created to enable navigation and geographic projection of parcels in space. More specifically, it can be used as a "tool" to locate a parcel by navigating to satellite images of "Google Maps" or through the "Google Earth" software, which are provided by "Google" and are governed by its own Terms of Use and Conditions. This application is free software and all rights with respect to the contents and the source code belong to the Department of Lands and Surveys.

Users can view and interact with information, images and other contents of the application for their personal, non-commercial information or their enjoyment. But they cannot under any circumstances reproduce, distribute, alter or use in some other way this material without the written consent of the Department of Lands and Surveys.

According to information received, the reasons for the very limited participation of PAs are the following :

- Lack of staff
- Refusal on the part of data producers to participate
- Failure on the part of competent bodies to take the appropriate decisions on the policy on making them available policy

- Protection of sensitive data that may jeopardize national security
- Absence of quality / updated data
- Uncertainty over the policy on making them available.

4.2 Stakeholders in the implementation of the INSPIRE Directive

- Management and coordination of the national infrastructure for geospatial information

As mentioned above, the competent authority under Law N.43 (I) / 2010 on the application of INSPIRE Directive is the Ministry of Interior. The management and coordination of the national infrastructure for spatial information is the INSPIRE Management Council (IMC), which consists of seven members and is chaired by the Permanent Secretary of the Ministry of Interior. Detailed reference to this was made above.

Data production and provision of services

The Department of Lands and Surveys at this stage provides the basic infrastructure for geospatial information and covers the main requirements of Annex I and some of the requirements of Annex II to the INSPIRE Directive. This infrastructure is provided through the sub-systems and databases of the Land Information System. It should be noted that these data are not yet totally in line with the requirements of the INSPIRE Directive.

The following initially processed table includes the main departments and agencies involved in the production of geospatial data in relation to Annexes I-III of the INSPIRE Directive. Complete information will be included in the electronic register of geospatial data.

INSPIRE ANNEXES	SPATIAL DATA THEMES	Ministries, Departments, Services
Annex I	Coordinate reference systems	Department of Lands and Surveys
	Geographical grid systems	Department of Lands and Surveys
	Geographical names	Department of Lands and Surveys
	Administrative units	Department of Lands and Surveys
	Addresses	Cyprus Posts, Statistical Service, Department of Lands and Surveys
	Cadastral parcels	Department of Lands and Surveys
	Transportation networks	Ministry of Communications and Works, Department of Lands and Surveys
	Hydrography	Water Development Department Department of Lands and Surveys
	Protected sites	Department of Environment, Town Planning and Housing Department, Department of Lands and Surveys

Annex II	Elevation	Department of Lands and Surveys
	Land cover	Department of Environment, Department of Forests
	Orthoimagery	Department of Lands and Surveys
	Geology	Geological Survey Department
Annex III	Statistical units	Statistical Service
	Buildings	Department of Lands and Surveys
	Soil	Geological Survey Department
	Land use	Department of Forests
	Human Health and Safety	Ministry of Health
	Utility and Government Services	Electricity Authority of Cyprus, CYTA, Sewerage Boards, Water Boards etc.
	Environmental monitoring facilities	Department of Environment
	Production and industrial facilities	Ministry of Commerce , Industry and Tourism
	Agriculture and aquaculture facilities	Ministry of Agriculture
	Population Distribution- demography	Statistical Service
	Area management/restriction/regulation zones and reporting units	Ministry of the Interior, Town Planning and Housing Department of Lands and Surveys
	Natural risk zones	Geological Survey Department, Department of Forests
	Atmospheric conditions	Department of Environment, Ministry of Labour
	Meteorological geographical features	Meteorological Service
	Oceanographic geographical features	Department of Lands and Surveys, Public Works Department, Department of Fisheries
	Sea regions	Department of Lands and Surveys, Ministry of Communications and Works, Department of Fisheries
	Bio-geographical areas	Department of Environment
	Habitats and biotopes	Department of Environment
	Species distribution	Ministry of Agriculture
	Energy resources	Energy Service, Ministry of Commerce, Industry and Tourism
Mineral resources	Geological Survey Department	

- Users of national infrastructure for geospatial data

The users of the national infrastructure for geospatial information are public authorities of EU member - states, institutions and EU bodies, businesses, citizens, etc.

The various stakeholders will gain classified access to geospatial information of the national infrastructure, in accordance with the rights, terms and conditions that will be finalized with the approval of the IMC.

4.3 The roles of stakeholders

The role of stakeholders for each of the components of the national infrastructure for geospatial information is described below:

Interoperability of geospatial data sets and services

Producers of data comprised in the national infrastructure for geospatial information, must make the geospatial data they produce and the services they provide, interoperable, pursuant to the provisions of the INSPIRE Directive and Law N.43 (I) / 2010.

The Department of Lands and Surveys and the Department of Information Technology Services provide support for the implementation of technical specifications and will provide through the National Geoportal appropriate tools for monitoring the compliance of infrastructure resources.

Web services

The development of web services, as defined in the INSPIRE Directive, will be designed on the basis of the recommendations to be made in the Strategic Plan which will be delivered in 2014.

Participation in the European INSPIRE geoportal will be made through the national web services already available, or services to be developed and maintained by the Republic of Cyprus.

For public authorities which do not have the expertise and infrastructures to provide the data they produce with web or geospatial services they themselves develop, the Department of Lands and Surveys, in cooperation with the Department of Information Technology Services will study ways of hosting and distributing such data. This practice can be implemented only in respect of those cases for which no provision for regular and frequent updating of data is envisaged.

This approach ensures the creation of the data by the appropriate body, and their sharing by the Department of Lands and Surveys, which has the expertise and infrastructure for this purpose, through the Land Information System.

- Monitoring implementation and reporting

Data producers must provide to the Ministry of the Interior relevant information for monitoring the implementation of the law and the Directive and the preparation of the progress reports provided for by the legislation.

Data producers will use the tools and information to be supplied.

4.4 Measures to ensure and facilitate the sharing of geoinformation

According to Law N.43(I)/2010, all geospatial data, the relevant services and metadata are shared between the PAs of Cyprus and EU member states as well as the institutions and bodies of the EU, the powers and purpose of which may have an impact on the environment. Search and imaging services, as well as metadata are made available to third parties without the payment of fees and with appropriate licence, while the transformation, invoking and reloading services shall be made available to third parties under user licenses which obligatory include their availability either with the payment of fees or not, depending on the intended use and the level of service requested. Fees and dues must be of a contributory nature and be kept to the minimum required level to ensure the necessary quality.

Already the Republic of Cyprus, through the Government Network Node has achieved the handling of large volumes of digital data. Geospatial data are accessible through the GIS with online link to the Land Information System of the Department of Lands and Surveys. Additionally, the Department of Lands and Surveys provides direct access to basic levels of LIS data through controlled web applications. Those procedures are still in limited use because of the old technology used. It is expected that, based on current efforts to upgrade the LIS, a modern system will be created, in which direct access will be more easily provided to a large variety of geospatial and other data to all interested parties.

Additionally, digital geospatial data are provided on a regular basis, both to government departments and agencies, and to individuals through digital means (CD's, DVD's, etc.), as well as through email. Static digital geospatial data are provided free of charge through the website of the Department of Lands and Surveys in various formats (PDF, KML, KMZ, jpg, etc.) .

4.5 Cooperation of Stakeholders

The Ministry of Interior, under Law N.43 (I)/2010, coordinates all activities concerning the implementation of the INSPIRE programme. The Management Council considers all matters relating to coordination between the Competent Authority and other state services involved and makes recommendations on the implementation of the Law. The Management Team nominates the technical committees, the subcommittees and the working groups and determines their terms of reference. It also invites at any meeting any officer of a public authority or any person with specialized knowledge to make recommendations on specific topics to assist its work.

4.5.1 Cooperation and agreements

As part of its responsibilities and aiming at a better cooperation, the Department of Lands and Surveys supports other PAs engaged in cartography and geoinformatics. These partnerships mainly involve the provision of geospatial data, mediation to resolve problems arising from the common use and sharing of data, the provision of specialized geoinformation services, geospatial data management services and the provision of know-how. Some of these actions are summarized below:

- Support to the Cyprus Agricultural Payments Organisation in geoinformatics questions and mass provision of geoinformation.

- Mass provision of geoinformation to the Electricity Authority of Cyprus for use in the GIS system it has developed.
- Supply of geoinformation to the Cyprus Telecommunications Authority.
- Supply of geoinformation to Ministries (Interior, Foreign Affairs, Defence, Agriculture and Commerce, Education etc.).
- Supply of geoinformation to Government Departments (Town Planning and Housing, Water Development, Public Works, Environment etc.)
- Provision of geoinformation to services (Statistical Service, the Police, Game Fund Service, Mining Service etc.).
- Provision of geoinformation to District Administrations.
- Provision of geoinformation to municipalities and communities.
- Provision of geoinformation to Water Supply Boards.
- Provision of geoinformation to Sewerage Boards.
- Provision of geoinformation to academic institutions and students.
- Provision of geoinformation to schools.

Agreements on issues of mutual interest have also been concluded with the following services:

- The Military Geographical Service of Greece
- The Defence Geographic Service of the United Kingdom
- The Cadastral Agency of Ukraine for cartographic issues

The creation and use of the Geoinformation Portal is expected to facilitate the sharing of geospatial information in the public domain, under a clear and uniform framework. .

4.5.2 Technologies facilitating cooperation and participation

The above actions to facilitate cooperation should be supported by the development of technologies that will facilitate interoperability and by extension the reduction of the resources consumed in the performance of any work required.

The further development and upgrading of the LIS and the National Geoportal will provide all the technologies that will ensure the fulfilment of the essential requirements of the national infrastructure and the participation of Cyprus in the INSPIRE programme. Until then, the existing actions of the Department of Lands and Surveys through the operation of the LIS aim at this direction.

The most important action is to create a national geoinformation catalogue that will enable interested persons to discover geospatial resources, have access to them through interoperable web services and understand the terms and conditions for their utilization.

So far, various information systems (IT) have been developed which gather valuable information at different thematic levels. To enable the user to have this information, he/she should consult the websites of entities operating these IT systems. When the user succeeds, he/she can only see the data or have limited access to them, since the web services developed can be consumed only by the

applications themselves, i.e. not appropriate APIs (application programming interfaces) are provided to enable data to be integrated into other applications. There are also examples of good practice in very limited numbers.

5 Use of geoinformation infrastructure

5.1 Use of geospatial services

The collection of information on the use of the infrastructure is done in direct contact with the relevant services. The aim is to create a National Geoinformation Catalogue, which should be updated on a regular basis.

5.2 Examples of use of geospatial data sets

Examples of use of geospatial data procured by the PAs of the country from other PAs, concern the following uses:

- Town planning / Regional Planning
- Environmental studies
- Development of water supply networks
- Development of sewerage networks
- Development of telecommunication networks
- Development of electricity networks
- Census and collection of statistics
- Update of cartographic databases
- Developing web applications for the presentation of thematic data
- Performing administrative acts for which area information is essential (e.g. information contained in the database of cadastral parcels)
- Spatial analysis, etc

5.3 Use by the public of the infrastructure for geospatial information

Currently only limited use is made of the infrastructure for geospatial data through web applications, however, this infrastructure is extensively used in the massive provision of digital geoinformation in various media.

The Department of Lands and Surveys has been very active in this field and provides massive digital geospatial data through the Land Information System.

It is expected that the forthcoming upgrade of LIS and the operation of the National Geoportal will provide comprehensive coverage and access to all concerned.

5.4 Trans-border use of the infrastructure for geospatial information

No relevant partnerships between Cyprus and EU members states, either for joint configuration of data sets that cover areas of competence of more than one country, have been established.

However, some Cyprus PAs participate in European and international organizations, e.g. the EuroGeographics through the Department of Lands and Surveys, while other stakeholders seem to be involved in international projects.

Some data sets produced by Cypriot public authorities will be available through the European geoportal and it is expected that appropriate tools will be created to monitor usage through the geoportal.

5.5 Use of transformation services

Transformation services, as defined under the INSPIRE Directive are not available yet.

After the upgrading of the LIS and the development of the information system of the National Infrastructure for Geoinformation, more data using various web and other geospatial services will be available.

6 Arrangements for sharing geoinformation

6.1 Arrangements for sharing geoinformation among public authorities (common use)

The obligation to establish rules for the sharing of geospatial data and services among the PAs and for the sharing and access of third parties under a single licencing framework is described in Law N.43 (I)/2010. These rules are expected to become more concrete with issue of the National Geoinformation Portal.

The licenses used at this stage to make the data of the Department of Lands and Surveys available are the following:

- License to use for internal needs within an organization
- License to use for specific publications (e.g. books, journals, etc.) with a fixed duration and number of copies
- Licence to use on the internet
- Licence for limited use in students' studies
- License for limited use for a specific purpose (e.g. an environmental study)
- Licence for commercial use

6.2 Arrangements for sharing among public authorities and EU institutions

The provisions relating to the sharing of geospatial data and the corresponding services among the PAs of Cyprus, will apply in the same manner to the PAs of the other EU member states, to the institutions and EU agencies and bodies established under international agreements, of which the EU and its member-states are members, solely for the purpose of exercising their functions which may have an impact on the environment.

Today, all geospatial data available through the online services of the Department of Lands and Surveys can be used by all PAs of Member States, the EU institutions and the public free of charge.

With the operation of the National Geoinformation Portal, new licences will be issued, subject to the provisions of the law and the Directive.

6.3 Obstacles to sharing and actions to address them

Three years after the enactment of Law N.43 (I)/2010 and the transposing of the INSPIRE Directive, their application, in some cases, is problematic.

The problems identified regarding common use and the sharing of geospatial data and services can be codified as follows:

- Incomplete application of rules laid down by the law and the Directive concerning the common use of geospatial data and services.
- Non-interoperable information systems of storing and management of PAs' geospatial data. Consequently, resources are needed to harmonize them with the technical requirements of the INSPIRE Directive.
- Lack of expertise among the staff of PAs on modern geoinformation technologies.
- Time consuming procedures for upgrading the LIS and operation of the National Portal.

7 Cost /benefit assessment

7.1 Cost of implementation of the INSPIRE Directive

The development of the National Geospatial Information Infrastructure, which was first created in the framework of the development and operation of the LIS at the DLS is ongoing and is being implemented through the various actions mentioned above.

The current national geoinformation infrastructure must be transformed appropriately to comply with European standards. This cost cannot yet be determined. It is expected that with the delivery of the Strategic Plan in 2014, extensive reference will be made on estimated costs.

The analysis that follows covers the cost of developing the National Geoinformation Infrastructure, which will be fully in line with European standards and ensure the participation of Cyprus in the INSPIRE infrastructure.

The costs required for the development of the National Infrastructure for Geospatial Information can be divided into three categories:

- **Development cost:** The cost relates to the development of infrastructure and web services and applications as well as to the preparation of specifications and rules on common use and sharing of the system and the data.
- **Cost of production of basic geospatial reference data:** The cost relates to the homogenisation of existing geospatial data in order to produce the background to be used for the presentation and dissemination of geospatial data through the information system.
- **Compliance costs for data producers:** The cost relates to the transformation of geospatial data and the development and maintenance of appropriate services, from PAs which produce geospatial data and are obliged to participate.

The individual basic costs concern the following categories:

- National Directory of Geoinformation
- Pilot web services of search and display
- Information System of the National Infrastructure for Geospatial Services and National Geoportal (budget)
- Monitoring of implementation and reporting
- Coordination of the network of the players involved and horizontal measures.

7.2 Benefits from the implementation of Law N.46(I)/2010 and the INSPIRE Directive

Given that the information system of the National Geoinformation Infrastructure is not yet in productive operation, it is difficult to quantify the benefits arising out of its operation.

In the following paragraphs an attempt is made to evaluate the benefit that has been observed so far, before the full operation of the information system of the National Infrastructure for Geospatial Information, as well as the benefit which is estimated to be achieved and on the basis of which the design of actions that will lead to the full development of the system was made.

7.2.1 Efficiency

The cost effectiveness of the investment for the development of an interoperable system of production and sharing of geoinformation produced by the public administration of Cyprus is undeniable. Already with the operation of the Land Information System multiple benefits have been observed.

No time-consuming search is required in searching for geospatial information. Through the National Infrastructure for Geospatial Data the information sought can be easily searched and found.

Unfortunately, the process of accessing the data and their use, even today is made without fully utilising the modern web technologies. The operation of interoperable services is very limited and the data are shared with the exchange of storage means and the email.

However, the publicity given to the Land Information System and the use of its data have given rise to increased demand for geospatial data, with the result that the actors who hindered the diffusion of

geoinformation without fully reasoned justification, have slowly been compelled to comply with the legislation.

Upon completion of the project and the full development of the INSPIRE infrastructure, multiple benefits are expected to accrue in terms of efficiency such as:

- Reduced time in searching and retrieving geoinformation already generated, due to the exploitation of web services.
- Reduction of geoinformation generation costs and saving of resources, since the data will be generated once and then reused.
- Reduction of the administrative burden of data generation, as web services will be utilised to meet requests.
- Strengthening the economy through development.

7.2.2 Effectiveness

The effective implementation of the INSPIRE program is examined with respect to the achievement of the goals set in its design. Unfortunately, it is not possible to evaluate the effectiveness of the project before its completion. Despite this, one can identify some examples that demonstrate the effectiveness based on the benefits observed during operation of the Land Information System:

- Better and more updated design of activities relating to space, since the competent agencies have at their disposal the most updated geoinformation.
- The users of geoinformation know the rules of access and use.
- Uniform accuracy and consistency of data is achieved.
- Bureaucracy is reduced and procedures are simplified.
- Better governance.
- The infrastructure of digital spatial information is a platform for innovative technological products and services.

7.2.3 Wider socio-economic benefits

The benefits from the access of the public and private sector to public geospatial information are numerous. Some examples of the use of geospatial data and the geoinformatics technologies are given below:

- Transparency and effective participation of citizens in government decisions.
- Ensuring transparency and combating arbitrariness through the widespread availability of planning regulations, protected zones and other building restrictions.
- Improving competitiveness with the possibility afforded to professionals to utilise geodata of the Public Administration

- Increasing competitiveness by avoiding distortions created by the privileged access to data.
- Strengthening participatory democracy through active participation and citizen control.
- Faster service to citizens and investor analysis.
- Easy search and identification of development / investment areas.
- Direct contribution to tourism and promotion of the country.
- Equal access to geospatial data afforded to everybody
- Monitoring of the environmental policy and citizen's compliance with the environmental conditions.
- Participatory democracy (e-democracy).
- Overall picture, correct and coordinated.
- Adoption of a single environmental policy rather than piecemeal actions.
- Qualitative data.
- Strengthening the relationship between citizens and the mechanisms of social groups for control and environmental monitoring.

7.2.4 Negative effects of the implementation of the INSPIRE Directive

The development of the National Infrastructure for Geospatial Data and the relevant European INSPIRE infrastructure can only have positive results. Nevertheless, a lot of obstacles must be overcome, many bad practices must be corrected and everybody should realise that that geospatial data produced with taxpayers' money are not the property of specific data producers. On the contrary, they constitute a national asset, which should be utilized to the maximum, sharing it among public authorities and making it available, so as to add value and create an economic product.

However, all of the above require finding the resources to be used for infrastructure development, creating and maintaining the data and ensuring its sustainability.

The design of the LIS, as well as the National Infrastructure for Geospatial Information is based on the premise that data should not be paid by end-users. The state should provide the necessary resources for the production of data and the provision of services, to be followed by making them freely available to citizens and businesses. The creation of products and services with economic value will repay the state for the investment made many times over, through entrepreneurship and savings. This precondition is already facing difficulty in its implementation due to the difficult financial period Cyprus is going through. Already great difficulties are being faced due to cuts in public expenditure and the allocation of resources for the creation and maintenance of geoinformation unfortunately has been relegated to secondary place.

8 Conclusions and recommendations for improving practices

Over the past 16 years or so spectacular progress has been made in the creation and availability of geoinformation due to the development and operation of the Land Information System at the

Department of Lands and Surveys. The enactment of the INSPIRE Directive imposed the obligation on member states to take action and create integrated infrastructure for geospatial data. Cyprus adopted the Directive immediately and law No. N.43 (I) / 2010 was enacted.

The Ministry of the Interior of the Republic of Cyprus, under Law N.43 (I)/2010, has undertaken a coordinating role in the implementation of the INSPIRE Directive in Cyprus, while the Department of Lands and Surveys, the Department of Information Technology Services and the Department of Environment have undertaken a leading role in organizing and implementing it. Under the new law, a Management Council and a Management Team were set up and the process of establishing technical committees and working groups has already started. The first and largest inventory of geospatial information produced in the country and a campaign to inform stakeholders are already under way.

In the current period intensive activities are going on for the radical upgrade of the existing Land Information System, in the context of which actions to satisfy a very large part of the provisions of the INSPIRE Directive are being taken.

In addition, work has started for the award of the preparation of the Strategic Plan for the overall implementation of the INSPIRE Directive. In this framework the design and initial operation of the INSPIRE Geoportal is taken into account.

The following paragraphs present some proposals for the improvement of existing practices.

8.1 Proposals aimed at improving the coordination and management of the National Infrastructure for Geospatial Information

The provision of Law N.46 (I) / 2010 for the establishment of committees and working groups to support the implementation of the law by all the public authorities falling within the broad scope of the National Infrastructure for Geospatial Information, is the most effective way to coordinate such a large network of PAs and individuals.

An indispensable requirement is that these committees and working groups be staffed with the most competent staff and have direct contact with the conditions of generation and maintenance of geoinformation produced by each PA.

In this critical phase Cyprus is passing through it has become clear that most PAs are under - staffed because of the mass exodus of employees and due to the freezing on the recruitment of new staff which has been imposed. The multiple benefits arising from the implementation of the INSPIRE Directive and their direct positive effects on the economy should be emphasized once again. A detailed description of these benefits was made earlier.

It is understood that there is a continuous need for ongoing information and training of staff involved. In addition, constant monitoring of what is happening on the European scene, as well as active participation in meetings of working groups held in Europe is necessary.

8.2 Proposals for the effective development and operation of the National Infrastructure for Geospatial Information

The creation of the most modern infrastructures and web applications, without the participation of the producers of geospatial data, does not guarantee the success of the objectives of the INSPIRE Directive. Given that participation in the implementation of the INSPIRE program takes place in parallel with the development of the National Infrastructure for Geospatial Information, coordination and support from the Department of Lands and Surveys are of critical importance, but even more crucial is the participation of PAs and the opening of geospatial data by the competent producers.

The issue of awareness, on the part of data producers, of the benefits from the creation and availability of geoinformation has been raised by the Ministry of the Interior during conferences and international meetings and during meetings of the Management Council of INSPIRE and the Management Team.

On its part, the Department of Lands and Surveys in collaboration with the Department of Information Technology Services takes the necessary measures for gradual compliance with the requirements of the INSPIRE Directive and can support the PAs which not yet have the necessary expertise and infrastructure.

The preparation of a comprehensive Strategic Plan for overall compliance with the INSPIRE Directive is already underway. Guidance and technical tools for the interim period have already been provided through the operation and upgrading of the Land Information System. For the development and operation of the infrastructure there is need for the timely commitment of the bodies responsible for data producers within the scope of the law and the Directive, so that they will be supported, guided or compelled if necessary to share their data with the public sector and to bring their policy of making the data available to third parties in line with the provisions of the relevant legislation.

8.3 Proposals for the implementation of common use for facilitating the availability of geoinformation

In the context of the actions taken to upgrade the Land Information System, an agreement was signed between the Department of Lands and Surveys and HSDData, a local IT company having foreign partners from Europe (GEODAN and KPMG). In the framework of this project a comprehensive Strategic Plan and tender documents will be prepared for the development of a new Land Information System and also the development of the infrastructure and other geospatial data as well as the implementation of a pilot program. This project includes the creation of a Geoinformation Portal at the Department of Lands and Surveys. Through this system, geoinformation will be shared, and a large part of the requirements of the INSPIRE programme will be met. Furthermore, work for the preparation of the assignment of a Strategic Plan for a comprehensive response to the requirements of the INSPIRE Directive, as well as the creation of a Geoinformation Portal at the Ministry of Interior and the preparation of tender documents for other needs is already under way.

The Strategic Plan will cover all the requirements of the INSPIRE Directive and determine among others optimal ways of implementing common use and making geoinformation available, beyond the functionality offered by the LIS.

8.4 Analysis of the monitoring and reporting procedure and recommendations for improvement

Until the operation of the comprehensive system of the National Geoportal, the results of the monitoring and reporting procedures may present problems, mainly due to the fact that the procedures today are mostly manual and there is no direct access to all data.

This problem also occurs in the monitoring procedures applied by the European Commission. The Ministry of Interior is facing the same problem, which should be resolved with the operation of the information system of the National Geoportal and the tools for the automatic or semi - automatic monitoring of the implementation of the Directive.