Spatial Data Infrastructures in *The United Kingdom:* State of play 2011

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Report meta-information

Title	Spatial Data Infrastructures in The United Kingdom: State of play 2011
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Date Issued	2010-09-01
Subject	INSPIRE State of Play
Publisher	K.U.Leuven (SADL + ICRI)
Description	This report is summarizing the review of SDI in the UK
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Format	MS Word 97/2000
Audience	INSPIRE stakeholders
Identifier	rcr11UKv122
Language	EN
Coverage	Summer 2010 – Spring 2011

Version number	Date	Modified by	Comments
1.0	2002-12-12	Catharina Bamps (SADL) & Peter Beusen (ICRI)	First version
2.0	2002-12-20	Jos Van Orshoven (SADL)	Completion & harmonization with 31 other country reports
3.0	2003-08-05	Catharina Bamps (SADL)	Consolidation and integration of comments received from Mr. K. Murray and Mr. Earnshaw (Ordnance Survey GB) Addition of : - Report meta-information - Executive summary - Abbreviations/acronyms
4.0	2003-08-14	Jos Van Orshoven (SADL)	Harmonisation with 31 other country reports
5.0	2004-07-09	Katleen Janssen (ICRI)	General review, correction and update of legal framework
6.0	2004-07-09	Catharina Bamps	Integration of comments from

		(SADL)	Mr. Connelly, Russell, Policy Co-ordinator OSNI (Response OSNI)', Mr Mark Linehan, director AGI and from limited review of web sites. General review, correction and update Addition of table pointing to changes with regard to Version 4
7.0	2004-07-23	Jos Van Orshoven (SADL)	Consolidation
8.0	2005-06-01	Neil Sutherland	Update the status for 2005
8.1	2005-08-04	Danny Vandenbroucke	Review and consolidation of the 2005 update
8.2.	2005-08-05	Katleen Janssen (ICRI)	General review, correction and update of legal framework
8.3	2005-09-26	Danny Vandenbroucke	Final report based on comments from the EC
9.0	2006-12-22	Katleen Janssen (ICRI)	General review, correction and update of legal framework
9.1	2006-12-29	Danny Vandenbroucke	Review and consolidation of the 2006 update
9.2	2007-01-17	Danny Vandenbroucke	Add information on Scottish SDI
10.0	2008-03-27	Katleen Janssen (ICRI)	Correction and update legal and organizational framework
10.1	2008-07-23	Danny Vandenbroucke (SADL)	Metadata and final changes
11.0	2010-03-18	Dimitrios Biliouris (SADL)	Review of the 2009 update
11.1	2010-06-02	Katleen Janssen (ICRI)	Review of the legal framework
12.0	2011-02-17	Katleen Janssen (ICRI)	Review and update
12.1	2011-09-02	Danny Vandenbroucke	Modify metadata, data and services sections
12.2	2011-09-20	Danny Vandenbroucke	Final Review

Executive summary

UK Location is a pan-government initiative to improve the sharing and re-use of the public sector geo-information. Established following the publication of the UK Location Strategy, it incorporates the implementation of the strategy and the EC INSPIRE. Coordination is through the Location Council. The Department of Environment, Food and Rural Affairs (DEFRA) is the main responsible organisation for the implementation of the UK Location Stategy.

The UK Location Strategy will be delivered through a multi-year programme of work – the UK Location Programme. This is intended to deliver a significant change in the management of location information – one that introduces a new, innovative, and joined up service for government, business and citizens – not only from within the UK but also across the European Union.

Furthermore, UK has set an implementation strategy by the UK Location program setting a roadmap on how the INSPIRE will be implemented in the UK. The central funding for implementation amounts to £10million over 5 years (2009-14) and it comes from the National Government. Business as usual thereafter for central co-ordination is estimated at £1million per annum. Data providers must provide funding for their own work in complying with the INSPIRE regulations and joining up with the UK Location Infrastructure (SDI).

The Ordnance Surveys of Great Britain and Northern Ireland and Association for Geographic Information are generally considered to have a central role in the elaboration and execution of this policy. At the same time each of the devolved administrations (N. Ireland, Scotland, and Wales) is implementing their Geographic Information Strategies.

Ordnance Survey (Great Britain) is the national mapping agency of England Scotland and Wales. It provides the underpinning reference framework and infrastructure. The environmental sector is playing an important role with initiatives to implement components of the SDI, especially for the environmental part of it. DEFRA, apart from leading the UK Location Council is also developing and/or involved in several initiatives to build those components in order to make environmental data more accessible: SPIRE, WIYBY and MAGIC are the most important examples.

The service based architecture is further evolving with services focusing on discovery and viewing, some of them being free, while others are paying services. In 2011 a single access point for governmental data and information, including spatial data, became operational.

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Abbreviations and acronyms

AGI	Association for Geographic Information
AHL	Admiralty Holdings Ltd
BGS	British Geological Survey
BS	British Standard
BSI	British Standards Institute
CEN	European Committee for Standardization
CLG	Communities and Local Government
CSV	Comma Separated Values
CT	Core Thematic Data
DCLG	Department for Communities and Local Government
DEFRA	Department of Environment, Food and Rural Affairs
DFP	Department of Finance & Personnel
DNF	Digital National Framework
DTM	Digital Terrain Model or
DWG	Data Working Group
eGIF	e-Government Interoperability Framework
EOF	Environmental Observation Forum
ESDIN	European Spatial Data Infrastructure
ESUs	Elementary Street Units
FIR	Further Investigation Required
FOISA	Freedom of Information (Scotland) Act
GEMINI	Geo-spatial Metadata Interoperability Initiative
GI	Geographical Information
GINIE	Geographic Information Network in Europe
GIS	Geographical Information System
GIS-MO	Getting Information Simply – Mapping Online
GMIS	Geographical Management Information Solutions
GML	Geography Markup Language
GNSS	Global Navigation Satellite Systems
GPS	Global Positioning System
HMSO	Her Majesty's Stationary Office
IFTS	Information Fair Trader Scheme
IGGI	Intra-Governmental Group on GI
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
ISO	International Organization for Standardization
LPS	Land and Property Services agency
MDIP	Marine Data and Information Partnership

MOLAND	Monitoring Land Cover / Use Dynamics
NAG	National Address Gazetteer
NDPB	non-departmental public bodies
NERC	Natural Environment Research Council
NGDF	National Geospatial Data Framework
NGO	Non-Governmental Organizations
NHS	National Health Service
NICS	Northern Ireland Civil Service
NIGIS	Northern Ireland Geographic Information System
NIMA	Northern Ireland Mapping Agreement
NIMSA	National Interest Mapping Services Agreement
NLIS	National Land Information Service
NLPG	National Land & Property Gazetteer
NPIA	National Policing Improvement Authority
NREIS	Networks for Rural and Environmental Information for Scotland NSAI National Spatial Address Infrastructure
NSDI	National Spatial Data Infrastructures
NSG	National Street Gazetteer
NTD	National Topographic Database
NUAG	National Underground Assets Group
ODPM	Office of the Deputy Prime Minister
OPSI	Office of Public Sector Information
OS	Ordnance Survey
OSGB	Ordnance Survey of Great Britain
OSMA	One Scotland Mapping Agreement
OSNI	Ordnance Survey of Northern Ireland
PGA	Pan Government Agreement
PSI	Policy and legislation on access to public sector information
PPP	Public-private partnerships
REF	Reference data
RIA	Regulatory Impact
SDIC	Spatial Data Interest Community
SDI	Spatial Data Infrastructures
SNS	Scottish Neighbourhood Statistic)
SPIRE	Spatial Information Repository
SSL	SeaZone Solutions Ltd
TNA	The National Archives
TOID	TOpographic IDentifier

UKHO	UK Hydrograhic Office
UKLII	UK Location Information Infrastructure
UKLP	UK Land & Property
UKSGB	United Kingdom Standard Geographic Base
UPRN	Unique Property Reference Number
VLA	Valuation & Lands Agency
VORF	Vertical Offshore Reference Framework
WIYBY	What's in your backyard?

1 GENERAL INFORMATION

1.1 Method

This report summarizes the review of the national SDI in the United Kingdom, and aims at reflecting the degree to which the SDI-situation is similar to the ideas set out in the INSPIRE position papers[1], the INSPIRE scoping documents and the INSPIRE implementing rules.

The 2002 report was based on the analysis of various documents, project references and web sites readily accessible. The 2005 report was completed by integration and consolidation of comments received from representatives of the Ordnance Surveys (GB in 2003 and NI in 2004 – both updated in 2005) and through interviews organized in the State-of-Play project in May-June 2003. The update of 2006 was based on input received from Mr. Neil Sutherland (Ordnance Survey), Mr. Russel Connelly (OSNI) and Mr. Cameron Easton (Scottish Executive). Presentation during the EC GI&GIS workshop gave additional information which was used for that update. In 2007, new information was gathered regarding the legal and pricing/funding issues through various channels. No information was received from UK authorities regarding data sharing practices (survey) and the data sets/services (templates).

For the 2009 SoP the questionnaire answered by the UKLP was used, along with information found in conferences and on the web. At the same time, obsolete information from the previous versions was removed, while a conclusion paragraph regarding the status of each indicator was added for each component. For the new report of 2011, new information was sought in various policy and technical documents, web sites, and conference material. This version of 2011 has been restructured and simplified in order to remove overlapping and repeating information.

1.2 The GI- and NSDI-scene in the UK

The UK has a unique political and administrative structure. It is made up of the three nations England, Scotland and Wales, and the province of Northern Ireland. Scotland has a specific legal system for particular aspects, reflected e.g. in the land registry which is different from the HM Land Registry in England and Wales.

1.2.1 The UK Location Strategy

Between 2006 and 2008, the Geographic Information Panel developed the UK Location Strategy, setting out the objective for the United Kingdom to maximise the value of geographic information to the public sector, the private sector and the public (see http://location.defra.gov.uk/wp-content/uploads/2009/12/uk-location-strategy.pdf).
Following this strategy, the UK Location Programme was set up as a multi-year programme to implement INSPIRE and the Location Strategy, and to build and develop

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

the UK Location Information Infrastructure for the re-use and sharing of location information.

Earlier, the Scottish government had already adopted a geographic information strategy 'One Scotland, One Geography'. The progress of the implementation of the 2005 strategy was reviewed in 2009 (see http://www.scotland.gov.uk/Topics/Government/PublicServiceReform/efficientgovernment/OneScotland/Implementation/Q/editmode/on/forceupdate/on). In Northern Ireland, a new strategy was adopted for 2009-2019, building on the 2003 Geographic Information Strategy (http://www.gistrategyni.gov.uk/gi_for_ni_strategy_09-19_web.pdf). The Geographic Information Strategy for Wales was launched in 2003, which was evaluated in 2008-2009 (http://www.agi.org.uk/storage/regions/agi-cymru/locationwales.pdf).

The UK Location Strategy will be addressed more in detail further on in the report. In this section, only a short overview of the Geographic Information Strategies of Northern Ireland and Scotland are given.

1.2.2 Geographic Information Strategy Northern Ireland

In 2008, a new Geographic Information Strategy for Northern Ireland was created for the period from 2009 to 2019 (Masser 2010). This strategy builds upon the previous GI Strategy governance structure and aligns it with the UK Location Strategy governance structure. The Strategy aims to further develop an infrastructure to ensure effective use of locational information in Northern Ireland. The aim is that by 2019 Northern Ireland has become a spatially enabled society in which government is using GI as a decision making tool, businesses are using GI to increase efficiency, and the public are actively using GI—all on a daily basis (Northern Ireland Geographic Information Strategy 2009–2019 "Effectively using in formation on location").

A key component of the strategy is the development of GeoHub NI®, which provides a platform for discovering and sharing spatial data (www.geohubni.gov.uk). Geohub enables access to geographic information for every public servant in order to facilitate policy development and evaluation, administration, and service delivery online.

The GI Strategy work in Northern Ireland is funded by the Northern Ireland Mapping Agreement (NIMA) which came into force in 2006. Under the terms of this corporate supply agreement all Northern Ireland public servants can use geographic information produced by Land & Property Services free at the point of use. Therefore funding as a major constraint to the use of spatial data is removed (Masser 2010).

Ordnance Survey Northern Ireland's (OSNI) own full product range is available via a map-enabled e-commerce website at https://maps.osni.gov.uk/. LPS via OSNI also maintains the UK's only common address database, Pointer, which cross matches and validates the address data from the Royal Mail, Valuation and Lands Agency, OSNI and local authorities, and georeferences each address, as well as giving it a unique identifier.

1.2.3 The Scottish initiative: One Scotland, One Geography

One Scotland - One Geography was launched at the Annual Convention of the Highlands and Islands on the 7th of November 2005. This Strategy has been produced in a wider UK, European and global context, including the Public Service Reform agenda. Progress of the Strategy was reviewed in September 2009 (see http://www.scotland.gov.uk/Topics/Government/PublicServiceReform/efficientgovernment/OneScotland/Implementation).

The One Scotland Mapping Agreement (OSMA) is a unique agreement between Scottish Government and Ordnance Survey covering Central and Local Government bodies and continues to grow with the inclusion of a growing number of NHS bodies. Significant progress has been made with the linkages between One Scotland Gazetteer and e-Planning, that has been facilitated by the Strategy. The Strategy has also provided the framework necessary to bring Geospatial Information within Scottish Government's Efficiency and Transformational Government policy area, which in turn has provided a focus for future cost savings.

2 Details of the NSDI-situation in the UK (UK Location Strategy)

2.1 General Information

In the April 2006 Transformational Government Implementation Plan, the Cabinet asked the Geographic Information Panel to create a UK Geographic information Strategy. The Location Strategy was adopted in 2008, and has the objective of maximizing the sharing of geographic information and increase the benefit for the public, government and the private sector. It intended to provide a framework to assist European, national, regional and local initiatives (Place Matters: the Location Strategy for the United Kingdom, *www.communities.gov.**uk**/documents/.../doc/1092704.doc*).

As was mentioned earlier, the UK Location Strategy will be implemented through the UK Location Programme. During this programme, a UK spatial data infrastructure will be developed, referred to as the UK Location Information Infrastructure (UKLII).The Location Programme intends to deliver a range of business services for data holders to publish location information and web services, in compliance with the INSPIRE directive. These services will be accessible through a portal hosted at data.gov.uk, while access via other entry points (national or local) may also be possible.

The UKLII is defined through a Conceptual Design, laid down in a Conceptual Model, a Blueprint (with supplement), and a Roadmap (see http://location.defra.gov.uk/programme/conceptual-design/). The Conceptual Model and the Blueprint were submitted to a public consultation before the final version was prepared. The conceptual model provides a general overview of what the UK LII should become, which is elaborated in more detail in the Blueprint.

The Roadmap defines the actual process and timing for the delivery of the UKLII. The approach to the implementation is based on a number of general principles, including an incremental approach that reflects possible funding constraints and allows the adaptation of the infrastructure to new external developments; the use of end user pilots and early adopters at an early stage; an open approach to data publishing that encourages publication of location information into the UKLII, even outside the INSPIRE themes; and the use of community expertise and collaborative processes (see http://location.defra.gov.uk/wp-content/uploads/2009/12/UKLII-Roadmap-20100208-v1-3.pdf).

2.2 Component 1: Coordination and organizational issues

The traditional producers of reference and core thematic spatial data in the UK are:

- Ordnance Survey Great Britain (OSGB), the national mapping agency of England, Scotland and Wales, providing the underpinning reference framework and infrastructure for Great Britain.

(http://www.ordnancesurvey.co.uk). Ordnance Survey is a non-ministerial government department and an Executive Agency responsible to the Secretary of State for Communities and Local Government (CLG). It operates as a Trading Fund under the Government Trading Funds Act 1973 and The Ordnance Survey Trading Fund Order 1999. Ordnance Survey launched its enhanced web-mapping portal, OS OpenSpace®, and provides a key component of the national georeferencing infrastructure through the delivery of a single consistent base of OS MasterMap®. OS MasterMap is a seamless geographic database, compatible with accepted web standards and ordered through a web interface. Ordnance Survey actively participates in the UK Location Council.

- Land and Property Services (LPS): On 1st April 2007, Land & Property Services (LPS) was established as an executive Agency within the Department of Finance and Personnel for Northern Ireland. In different phases, it merged Ordnance Survey of Northern Ireland, Land Registers Northern Ireland, the Valuation and Lands Agency and the Rate Collection Agency. It is responsible for the mapping, the underpinning reference framework and infrastructure for Northern Ireland. (http://www.lpsni.gov.uk/index/gi.htm).

- Royal Mail, the producer and maintainer of the postal address file.

Other important players include:

- DEFRA: the Department for Environment, Food and Rural Affairs chairs the Location Council and has the lead in the implementation of the UK Location Programme.

- The Association for Geographic Information (AGI) (http://www.agi.org.uk) which brings together over 1.000 members from public and private sectors, data producers and users. Following the devolution or decentralisation, national groups were set up in Scotland (AGIS), Wales and Northern Ireland. AGI is a member of the UK Location Council, and an INSPIRE Spatial Data Interest Community (SDIC). It administers the British Standard's Committee for Geographic Information (IST36) and manages and runs the national geographic metadata service (gigateway (http://www.gigateway.org.uk/). Gigateway is a web service aimed at increasing awareness of and access to geographic information in the UK and is funded by the UK Government through the UK Location Programme. Gigateway will be replaced by a new service, under the UK Location Programme in 2010/11.

- The Intra-Governmental Group on GI (IGGI), representing central government departments;

- The Improvement and Development Agency for Local Government (http://www.idea.gov.uk);

- The Cabinet Office, through its direct-government Unit (http://www.direct.gov.uk/en/index.htm) in respect of e-government policies, and through the National Archives in its role of stimulating and supporting information management.

- Communities and Local Government, which are responsible for local governments, regional development; and planning http://www.communities.gov.uk/newsroom/about/ ;

- In Scotland the Scottish Executive fulfils much the same role as the Office of the Deputy Prime Minister (ODPM) in England. http://www.scotland.gov.uk ;

- In Wales the National Assembly fulfils much the same role as the ODPM in England. http://www.wales.gov.uk ;

The UK Location Programme is led by the UK Location Council, a cross-government group consisting of senior representatives from local, devolved and central government organisations, appointed as the coordination body for the INSPIRE implementation in UK. Detailed information about its composition can be found at: http://www.DEFRA.gov.uk/location/uklc-report-08-09.pdf. The Location Council provides leadership and strategic direction for the implementation of the Location Strategy and the INSPIRE directive, and it is responsible for the delivery of the UK Location Programme. The Location Council is chaired by DEFRA and holds representatives from Ordnance Survey, UK Statistics Authority, LPS Northern Ireland, the Scottish Executive, Ministry of Defence, the Cabinet Office, Department of Treasury, Land Registry, the British Geological Survey, Communities and Local Government, the National Archives, the Environment Agency, the Welsh Assembly Government, AGI and the private sector. In this way, participation of the many important data publishers, Scotland, Northern Ireland, Wales and the private sector is ensured.

Next to the Location Council, several other bodies are involved in the governance model, including:

- Ministerial Committees: these committees have non-executive responsibility for the strategic oversight of the Location Programme.

- Location Delivery Group: an operational delivery coordination group;

- Location User Group: advisory group that monitors the UK Location strategy implementation programme in order to ensure that the user needs and priorities are met;

- Location Interoperability Board: this board makes the decisions on technical and business interoperability and the publishing of deliverables. It is responsible for the policy and standards.

- Co-ordination Unit: this unit will take care of the ‘business as usual”, taking over from the UK Location Programme Unit.

(See http://location.defra.gov.uk/wp-content/uploads/2009/11/UKLC-Governance-Arrangements-v10.pdf).

2.2.1 Conclusions of Component 1

The approach and territorial coverage of the SDI is truly national and a number of the SDI components have reached a significant level of operationality. The initiative goes beyond one single organisation. In addition, the regional developments in Scotland and Northern-Ireland remain important. DEFRA is leading the Location Council, in wich many data publishers, the regional governments and AGI are represented. Mainly public sector producers are participating in the SDI while there is a very small involvement of non-public sector actors.

Based on these conclusions we score the indicators as follows:

- The approach and territorial coverage of the SDI is truly national
- One or more components of the SDI have reached a significant level of operationality (5)
- The officially recognised or de facto coordinating body of the SDI is a NDP, i.e. a NMA or a comparable organisation (No)
- The officially recognised or de facto coordinating body for the SDI is an organisation controlled by data users (Partially)
- An organisation of the type 'national GI-association' is involved in the coordination of the SDI
- Producers and users of spatial data are participating in the SDI
- Only public sector actors are participating in the SDI (No)

2.3 Component 2: Legal framework and funding

2.3.1 Legal framework

Before the development of the UK Location Strategy, no encompassing policy on the coordination of the provision and dissemination of GI existed at the level of central government. A legal framework for the NSDI in the UK was not developed. The Location Strategy is the general strategic document on which the set-up and implementation of the UK NSDI is based.

As a part of the Location Strategy, the INSPIRE directive was transposed by the INSPIRE regulations in December 2009. The final text has been published at http://www.opsi.gov.uk/si/si2009/uksi_20093157_en_1. The development of the legal text was preceded by a consultation on the policy principles on which the regulations were based. The consultation showed the need for a further assessment of the costs and benefits, and a need for communication and guidance (see Explanatory Memorandum to the INSPIRE Regulations 2009).

Sub-national legislation also exists for Scotland.

(See http://www.opsi.gov.uk/legislation/scotland/ssi2009/ssi_20090440_en_1)

2.3.2 Public-private partnerships (PPPs)

An important 'flagship' project with respect to public-private partnership in the GI-sector is lead by the National Land Information Service (http://www.nlis.org.uk). This project is providing a service through which it is now possible to search for property details online. The National Land and Property Gazetteer can also be considered as a form of PPP. This is the national address list that has to be updated by the local authorities in England and Wales. The NLPG is a partnership between Local Government Information House, the Improvement and Development Agency, Intelligent Addressing and Local Government Association.

General statements about PPP related to GI have not been found.

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

The UK Parliament broadly signalled its position with regard to the accessibility of public sector information by passing a Freedom of Information Act in 2000, which came into full force in January 2005. The Act has received considerable criticism from many politicians across the political spectrum and NGOs as being insufficient and weaker than the existing code of practice. In June 2002, the Scottish Parliament approved a Freedom of Information bill that is regarded as stronger than the English Freedom of Information Act. It also will not go into effect until 2005. Free access by the citizen to information on

the environment has however been specified since 1992 by a Statutory Instrument, which was replaced by new Regulations in January 2005.

The Re-use of Public Sector Information Regulations 2005 (Statutory Instrument 2005 No. 1515), transposing Directive 2003/98 on the re-use of PSI came into force on 1 July 2005. The regulations do not impose a general obligation on the public sector bodies to make their documents available for re-use. A public sector body may permit re-use, and if it decides to do so, it has to comply with the regulations.

The Office of Public Sector Information (OPSI), which has a regulatory function for PSI holders has merged with The National Archives with effect from October 2006. The merger created a stronger centre for information management in the public sector, enabling a more responsive approach to the challenges of new technology. The combined organisation will be known as The National Archives, which will continue to operate as a government department and as an executive agency of the Secretary of State for Constitutional Affairs (http://www.opsi.gov.uk).

A number of studies have been done in the UK to show the value of availability of public sector data under non-restrictive conditions and at a charge of marginal costs or lower (e.g. the Office of Fair Trading's report on Commercial Use of Public Information, the Power of Information Report, the Cambridge Report on Models of Public Sector Information Provision via Trading Funds). These studies paved the way for initiatives of the Office of Public Sector Information and other public bodies to start opening up data. In June 2009, Prime Minister Gordon Brown enlisted Sir Tim Berners-Lee to help move the British public sector towards opening up its data (Cabinet Office 2009). Following this initiative, the data.gov.uk website was launched in January 2010, with currently over 3,000 datasets that are available for re-use, free of charge and without use restrictions. During 2010, the Public Sector Transparency Board was established by the Prime Minister with the objective to drive forward the Government's Transparency Agenda and promoting the opening up of government data.

2.3.4 Legal protection of GI by intellectual property rights

Part I on copyright of the Copyright, Designs and Patents Act 1988 extends to England and Wales, Scotland and Northern Ireland. It came into force on 1 August 1989. Chapter X of Part I of this Act has some special provisions on Crown and Parliamentary copyright. This 1988 Act provided a major updating of copyright law but the process has continued since then with a number of amendments.

EU Directive 96/9/EC of 11 March 1996 on the legal protection of databases was implemented by the Copyright and Rights in Databases Regulation 1997, coming into force on 1 January 1998. The Copyright (Computer Programs) Regulations 1992 came into force on 1ste January 1993. Both Regulations made amendments to the above Copyright, Designs and Patents Act 1988. The amendments to the Copyright Act that transposed the 2001 directive on copyright in the information society into English law came into force on October 31st, 2003.

In the UK, government geo-information is strongly protected by far reaching Crown copyright. No other country has a system quite like it. Crown copyright is defined in the above Act as a work made by Her Majesty or by an officer or servant of the Crown in the course of his duties. It covers a wide range of material, including legislation, government codes of practice, Ordnance Survey mapping, government reports, official press releases, government forms and many public records.

There are however public sector copyright owners other than the Crown, such as local authorities and non-departmental public bodies (NDPB). These are thus not subject to Crown copyright control. The UK system of Crown copyright does however apply to Ordnance Survey (http://www.ordnancesurvey.co.uk), which holds a strong market position as far as geographic products is concerned. It is responsible for mapping at all the scales. The Ordnance Survey therefore exercises a virtual monopoly in the provision of mapping through the enforcement of Crown copyright.

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

The Parliament approved the Data Protection Act in July 1998, which came into force on 1 March 2000. This Act updates the 1984 Data Protection Act in accordance with the requirements of the EU Directive 95/46/EC. The 1998 Act covers records held by government agencies and private entities. It provides for limitations on the use of personal information, access to and correction of records and requires that entities that maintain records, register with the Information Commissioner (http://www.informationcommissioner.gov.uk). The Office of the Information Commissioner is an independent agency that maintains the register and enforces the Act.

Directive 2002/58 on privacy and electronic communications has been transposed into English law.

2.3.6 Licensing framework

Public sector information regulated by Crown Copyright is licensed by the Controller of Her Majesty's Stationery Office (HMSO) at The National Archives (TNA) but for many geographic datasets, the data providers have their own licensing policy, e.g. Ordnance Survey, British Geological Survey, Environment Agency, and Met Office. However, TNA works with these agencies (and with local authorities and other public bodies) to harmonise licensing policies, by giving advice, providing guidelines and by managing the Information Fair Trader Scheme.

The Information Fair Trader Scheme (IFTS) ensures that re-users of public sector information can be confident that they will be treated reasonably and fairly by public sector information providers. All Crown bodies that have a licensing delegation from the Controller of OPSI (such as Ordnance Survey) must join the Scheme, but it is open to public sector organisations to join voluntarily. Public bodies that are accredited under the scheme include Ordnance Survey, Ordnance Survey of Northern Ireland, British Geological Survey, Registers of Scotland and the UK Hydrographic Office.

In June 2009, Prime Minister Gordon Brown enlisted Sir Tim Berners-Lee to help move the British public sector towards opening up its data (Cabinet Office 2009). Following this initiative, the data.gov.uk website was launched in January 2010, with currently over 3,000 datasets that are available for re-use, free of charge and without use restrictions under the Open Government Licence. The only conditions involve attribution (see http://www.nationalarchives.gov.uk/doc/open-government-licence/open-government-licence.htm). The UK Location Data Sharing Operational Guidance establishes the UK Government Licensing Framework as the basis for licensing the use of datasets that are part of UK Location. When the location data is available without further restrictions, conditions or charges, the Open Government Licence will be used as the default licence. For other data, new licence models are being developed. (UK Location, UK Location Data Sharing Operational Guidance Part 2 – Licensing and Charging, http://location.defra.gov.uk/2011/03/data-sharing-operational-guidance/).

In March 2010, Ordnance Survey decided to make some of its datasets openly available under the OS Open Data Licence, using the same licence terms as the data.gov.uk website. See http://www.communities.gov.uk/news/corporate/1529556). Since November 2010, a new licensing and pricing model was launched for the Ordnance Survey data that was not subject to the OS Open Data Licence (see http://www.ordnancesurvey.co.uk/oswebsite/business/licences/2010-model.html). Next to its regular licensing policies, Ordnance Survey also has a number of Collective Licensing Agreements, for instance with the National Health Service, and with central bodies under the Pan-Government Agreements. Since April 2009, Ordnance Survey and Landmark have launched a new version of the Pan-Government Agreement for 4 years, providing national bodies with access to a broader set of data at an affordable price (see http://www.ordnancesurvey.co.uk/oswebsite/business/sectors/health/NHSagreement/NHSagreement.html;http://www.agi.org.uk/POOLED/articles/bf_newsart/view.asp?Q=bf_newsart_309178).

2.3.7 Funding model for SDI and pricing policy

The UK has no mechanism for the central funding of pan-government initiatives. Funding has to be obtained collectively, across public sector bodies. This will have most impact on those areas of the approach that would benefit from the use of ‘seed funding’, e.g. end user application pilots and the deployment of third party products and services. These will need to be funded entirely by the contributing organisations. With regard to the implementation of the UK Location Strategy, prevailing funding constraints may also have a major impact on the ability of data publishing organisations to implement the changes that they will need to apply to their own internal processes and systems (UK Location Programme Conceptual Design). A budget has been foreseen for implementation of the UKLII, with investments of 10.0 million £ over 5 years, with 1.0 million £ for coordination.

A number of the large providers of geographic data in the UK have the status of a Trading Fund, requiring them to gain a return on investment on their activities and make a profit. Therefore, many of these organisations have a tradition of cost recovery. For instance, since April 1999, the Ordnance Survey (GB) operates as a Trading Fund (the

user pays funding model) and has as such greater responsibility for its own finances and planning, extra freedom to develop new initiatives. Under the 2004 framework document, the financial management of Ordnance Survey is underpinned by 3 principles:

- The Trading Fund model is one of breaking even one year with another after allowing for operating costs, investment needs, loan repayments and agreed levels of dividend'';
- In the event that Ordnance Survey is more profitable than forecasted after investing in national interest and customer driven improvements, surpluses in excess of those needed to sustain future development can be avoided by lowering prices;
- Revenue shortfalls will be compensated, where possible, by an appropriate combination of increased productivity, efficiency savings, reduced costs, lower dividends and curtailing loss-making, on-core activities.

In 2009-2010, the total turnover was £ 114.3 million, and the trading surplus amounted to £16.6 million.

The consultation on the business model of the OS at the end of 2009 showed that OS would need to rethink some of its working principles. Now that OS is making a considerable part of its datasets available free of charge, the Government has committed itself to provide ongoing funding to support this (see http://www.ordnancesurvey.co.uk/oswebsite/media/news/2010/April/OpenData.html)...

Pricing

According to the 2005 Re-use of PSI Regulations, a public sector body may charge for allowing re-use. The total income from any charge cannot exceed the sum of the cost of collection, production, reproduction and dissemination of documents and a reasonable return on investment. Where a public sector body charges for re-use, so far as is reasonably practicable, it has to establish standard charges. Where a standard charge for re-use has not been established, the public sector body shall specify in writing the factors that will be taken into account in calculating the charge if requested to do so by an applicant.

The GI sector has developed within a robust commercial framework, with central government also adopting a policy of cost recovery for some of its data resources. Funding thus falls upon the users, which ensures that the products are customer driven and that the data is maintained. The UK government directs its agencies to recover costs through charges and other income-generating activities, for instance, under the 2004 Framework document, Ordnance Survey prices are determined by a number of factors:

- Value to customers;
- Information content relative to other Ordnance Survey products;

- Effect of competitive forces and existing pricing structures in the marketplace;
- Investment funding required to continue to meet customer requirements and
- The need for the Trading Fund to achieve its long-term financial and investment targets and generate a return on its assets.

Under the initiative set up by Gordon Brown and sir Tim-Berners Lee in 2009, increasingly datasets held by the public sector are made available free of charge. On 1 April 2010, Ordnance Survey launched OS Open Data, an online portal providing free and unrestricted access to a large range of its datasets (See http://www.ordnancesurvey.co.uk/oswebsite/media/news/2010/April/OpenData.html).
The available datasets include:

- OS Street View;
- 1: 50 000 Gazetteer;
- 1: 250 000 Colour Raster
- OS Locator
- Boundary-Line
- Code-Point Open
- Meridian 2
- Strategi
- MiniScale
- Land-Form PANORAMA
- OS VectorMap District.

The new Data Sharing Operational Guidance from UK Location promote as good practice that charges for location data are kept to a minimum. Any charges should take into account the developing Government strategy to allow more open access to public data; the necessary quality and supply of location data sets and location data services; the Government's commitment to release more publicly held data; the need to develop a more efficient or a more usable service; the need to cover marginal costs; and any requirement on an authority to be self-financing.

2.3.8 Conclusions of Component 2

There is no true NSDI legislation in the UK, but the INSPIRE regulations provide for a partial legal framework and the Location Strategy is a strategic document that guides the

development of the NSDI. A small number of true PPPs exist. GI can be specifically protected by Crown Copyright, but initiatives are being taken to make data more freely available, such as the data.gov.uk initiative which made over 3000 datasets available for re-use, free of charge and with very limited use restrictions.. This was followed by the Ordnance Survey decision to make some of its data freely available. At the moment there is no long-term financial security of the SDI-initiative, but a budget is foreseen for the development of the UKLII, with investments of 10.0 million £ over 5 years, with 1.0 million £ for coordination.

Based on these conclusions we score the indicators as follows:

- There is a legal instrument or framework determining the SDI-strategy or –development
- There are true PPPs or other co-financing mechanisms between public and private sector bodies with respect to the development and operation of the SDI-related projects (partial)
- There is a freedom of information (FOI) act which contains specific FOI legislation for the GI-sector (partial)
- GI can specifically be protected by copyright
- Privacy laws are actively being taken into account by the holders of GI (partial)
- There is a framework or policy for sharing GI between public institutions (partial)
- There are simplified and standardised licences for personal use
- The long-term financial security of the SDI-initiative is secured (partially)
- There is a pricing framework for trading, using and/or commercialising GI (partial)

2.4 Component 3: Data for themes of the INSPIRE annexes

2.4.1 Data sets of different resolutions covering the INSPIRE and other themes

The scale levels supported by the various data producers in the UK cover the:

- large scale (1:1.250, 1:2.500),
- mid- scale (1:10.000, 1:25.000),
- small scale (1:50.000 and smaller).

The main data providers are Ordnance Survey (GB and NI). OS provides its data via its webpage (http://www.ordnancesurvey.co.uk/oswebsite/products/) and its OS Open data application (http://www.ordnancesurvey.co.uk/oswebsite/opendata/index.html), while OSNI information is available in the GeoHub NI website (http://www.geohubni.gov.uk/index/geohubni_datasets.htm). They are also the main producers of geographical names datasets, and addresses.

At the same time geodatasets with maritime features (coastal zone and offshore) are produced by the UK Hydrographic Office. Land and Property data are held by Her Majesty's Land Registry, Registers of Scotland and the Land Registers of Northern Ireland. Socio-economic data are held by from the Office of National Statistics, and the Scottish statistical service (General Register Office for Scotland). Geological databases are held by the British Geological Survey. Other important datasets include transport networks, protected sites, land cover, land use, utilities, environmental monitoring and species distribution. For the environmental data sets, many agencies are involved: e.g. Centre for Ecology & Hydrology, Environmental Agency, English Heritage, Natural England, Scottish Natural Heritage, etc.

In addition there are several important data resources available from the private sector, for example historical maps, imagery, and geodemographic classifications, and from local government.

A detailed description of the available mapping products exists on the Ordnance Survey website (http://www.ordnancesurvey.co.uk/oswebsite/products/), the OSNI map shop (https://maps.osni.gov.uk/) as well as in the Scottish SDI initiative (http://www.scotland.gov.uk/Publications/2010/05/06161701/5)

2.4.2 Geodetic reference systems and projections

Great Britain: The Transverse Mercator Projection is used by the Ordnance Survey to provide a clearly defined spatial reference system in Great Britain for any place or entity whatever the map scale.

Local horizontal and vertical coordinate system definitions and transformations to/from ETRS89 (OSTN02 and OSGM02 respectively) are available from www.gps.gov.uk. Previous to OSTN02, the horizontal mapping coordinate system of Great Britain (OSGB36) was still defined by the National Grid positions of the old triangulation points. Since 2002, OSTN02 has defined OSGB36 National Grid in conjunction with the ETRS89 positions of the National GPS Network stations.

All maps of Northern Ireland published since 1955 are based on a Transverse Mercator (Gauss Conformal) projection designed to cover the whole of Ireland and known as the Irish Grid. The projection parameters are:

- **True Origin** Lat 53 30' North, Long 8 00' West of Greenwich;
- **False Origin** 200 000 metres West and 250 000 metres South of true origin;
- **Scale Factor on central meridian** 1.000 035 **Approximate scale factor at Eastern and Western extremities**: 1.000 525;
- **Unit of Length** International metre.

The Northern Ireland primary triangulation station co-ordinates may be obtained from Ordnance Survey of Northern Ireland based on the following Datums ;

Ireland (1975)	Geographical co-ordinates
OSGB (SN) 70	Geographical co-ordinates
OSGB (SN) 80	Geographical and Cartesian co-ordinates
ED50	Geographical co-ordinates
ED87	Geographical and Cartesian co-ordinates
WGS84	Geographical and Cartesian co-ordinates

2.4.3 Quality of the data

The UK Location Programme followed the PRINCE2 standard for quality assurance. The quality assurance is subject to challenge by independent reviews from the Office Of Goverment Commerce. UKLP is working with the data providers and the users on procedures and quality criteria, and is planning to implement Memorandums of Agreement with data providers on the self-validation of metadata, and Service Level Agreements for the resources that are published.

Information on the update frequency is available for the different data products from Ordnance Survey via http://www.ordnancesurvey.co.uk/oswebsite/products/index.html

2.4.4 Interoperability

The UK Location Programme will create a common framework for the adoption of common standards and protocols. (see UKLI conceptual model). ISO standards are not widely used, but the medata standard has been adopted through UK Gemini (UKLI Blueprint). Specific standards had already been developed within specific thematic or other communities, e.g. e-Government Interoperability Framework (eGIF), the development of street and address datasets to the BS7666 standard by local government, and the metadata standard for the Marine Environmental Data and Information network.

Many UK data custodians are involved in data interoperability and harmonization efforts in thematic fields such as geology and hydrography (One Geology), nature protection (Nature-SDI+), topographic reference data (ESDIN), soils (GS Soil), etc.

Formats provided by the Ordnance Surveys include GML, NTF, DXF, ASCII, DWG, MAP INFO, TIFF.a

UK Location is working actively on linked data issues and has organised a number of workshops on the importance of linked data and the semantic web for UK Location.

2.4.5 Language and culture

Metadata and documents are provided in English. In addition, Ordnance Survey has adopted a Welsh Language Scheme that enshrines the principle of treating the English and Welsh languages equally when conducting business in Wales. Contact in Welsh is welcomed and many documents, including a version of the corporate web site, are available in Welsh.

Geographical names within Great Britain are generally managed in English. In Wales and parts of Scotland, names are collected bilingually when they are so defined by those responsible for naming.

2.4.6 Geographical names

A Gazetteer with around 250,000 entries of all names appearing on the Landranger map series (1:50,000 scale) is available.

Gazetteer of Place names: An ASCII list of 330 main cities, towns and villages of Northern Ireland appearing on the 1:250.000 map is available. Irish Grid references, to a precision of 100 metres are incorporated.

The national street Gazetter operates in three levels:

The level 1 specification consists of streets described by their name, classification or general description and provided with a unique street reference number. In addition each street is given a spatial location through a national grid reference to its start and end points along with the names of the locality, town and administrative area.

The level 2 specification consists of street references with Elementary Street Units (ESUs) and their attributes.

The level 3 specification consists of the level 1 and level 2 attributes but has additional attributes and shaping vertices relating to the geometry of the street as defined by its ESUs.

The NSG is structured according to BS7666 part 1. The NSG dataset comprises a set of local street gazetteers in compressed Comma Separated Values (CSV) format - one file for each local Highway Authority area, Government Operational Region or country as requested. (http://www.thensg.org.uk/iansg/link.htm?nwid=82).

Conclusions of Component 3

Geodatasets exist that provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components. The geodetic reference system and projection systems are standardised, documented and interconvertable. No documented data quality control procedure at the level of the SDI has been found. The UK's concern for interoperability is dealing with data exchange formats such as GML, NTF, DXF etc., but many data custodians are also involved in data harmonisation efforts through European projects (e.g. One Geology, ESDIN, Nature-SDI+). The language used is English.

Based on these conclusions we score the indicators as follows:

- Geodatasets exist which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components
- The geodetic reference system and projection systems are standardised, documented and interconvertable
- There is a documented data quality control procedure applied at the level of the SDI (Partially)
- Concern for interoperability goes beyond conversion between different data formats
- The national language is the operational language of the SDI
- English is used as secondary language

2.5 Component 4: Metadata

2.5.1 Availability

Metadata are produced by most data producing organizations. A significant part of geodatasets has metadata of some form.

From all the 422 reported spatial data sets ande services under INSPIRE MR, 81% have metadata. Of all the spatial data sets of annex I and annex II, only a few have no metadata. For the annex III data sets, this is much lower (46%).

2.5.2 Metadata catalogues availability + standard

Metadata are catalogued by the three Ordnance Surveys, by AGI and others.

A document has been produced in 2009 describing Metadata guidelines for Geospatial Datasets in the UK with the use of UK Gemini2, available at: http://location.DEFRA.gov.uk/wp-content/uploads/2010/03/MetadataGuidelines2.pdf.

UK GEMINI specifies a core set of metadata elements for use in a geospatial discovery metadata service. The first version GEMINI, (v1.0) was published in 2004 and is used in the GIgateway metadata service. GEMINI2 is a revised version, meeting the requirements of the INSPIRE metadata Implementing Rules.

GEMINI 2 will be used as the basis for the new UK geospatial discovery metadata service under the UK Location Programme.

The metadata elements are as follows:

Element number Element name

1. Title
2. Alternative title
3. Dataset language
4. Abstract
5. Topic category
6. Keyword
7. Temporal extent
8. Dataset reference date
9. Lineage
10. West bounding longitude
11. East bounding longitude

12. North bounding latitude
13. South bounding latitude
14. Extent
15. Vertical extent information
16. Spatial reference system
17. Spatial resolution
18. Resource locator
19. Data format
20. Responsible organisation
21. Frequency of update
22. Limitations on public access
23. Use constraints
24. Additional information source
25. Metadata date
26. Metadata language
27. Metadata point of contact
28. Unique resource identifier
29. Spatial data service type
30. Coupled resource
31. Resource type
32. Originating controlled vocabulary
33. Conformity
34. Specification

Use is made of the Dublin core for documenting data but it is not clear to what extent this also applies to GI.

Next, there are multiple standardised metadata catalogues available covering more than one data producing agency, such as SPIRE from DEFRA, which is primarily a data repository for geospatial environmental information while it offers a range of search, view and download services for the DEFRA Network and other authorised users. Similarly, MAGIC is a web mapping site targeting the public offering information about coastal and marine resources, habitats inventories, etc. It offers similar search, view and download facilities to SPIRE, but with its own data management processes and data storage.

2.5.3 Metadata implementation

A UK Location metadata editor has been developed under the Location Information Programme by Ordnance Survey and is provided either online of via download. Both format have functions that support the creation of UK GEMINI v2.1 xml metadata records:

- UK GEMINI 2 Data and Service Metadata templates
- UK GEMINI 2 View and labelling
- Form tips on the completion of UK Location discovery metadata for data and services
- XML rule-based validation (Schematron)
- Import of UK GEMINI 1 records
- Templates configurable for addition of standard text and ISO 19115 extensions to UK GEMINI 2 Metadata

(http://location.defra.gov.uk/resources/discovery-metadata-service/metadata-editor/)

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- Import of UK GEMINI 1 records
- Templates configurable for addition of standard text and ISO 19115 extensions to UK GEMINI 2 Metadata

(http://location.defra.gov.uk/resources/discovery-metadata-service/metadata-editor/)

2.5.4 Conclusions of Component 4

Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes as confirmed by the MR results (more than 75% of the data sets of annex I and II have metadata. This is only 40% for the data from annex III).

There are multiple standardised metadata catalogues available covering more than one data producing agency, such as SPIRE from DEFRA, which is primarily a data repository for geospatial environmental information while it offers a range of search, view and download services for the DEFRA Network and other authorised users. Similarly, MAGIC is a web mapping site targeting the public offering information about coastal and marine reoruces, habitats, etc. It offers similar search, view and download facilities to SPIRE, but with its own data management processes and data storage. Moreover, there is an initiative by UK location programme, the GEMINI 2 that will be used as the basis for the new UK geospatial discovery metadata service to be introduced in 2010/11.

Based on these conclusions we score the indicators as follows:

- Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes

- One or more standardised metadata catalogues are available covering more than one data producing agency

- There is a coordinating authority for metadata implementation at the level of the SDI (partially)

2.6 Component 5: Network Services

Regarding the three INSPIRE annexes addressing the 34 spatial data themes, the UK is providing discovery and view services for most of them while a number of them can also be downloaded.

2.6.1 Geoportal

A UK geoportal is operational since Spring 2011: http://data.gov.uk. The idea is opening up government to the citizens by giving them access to governmental data and information in order to help people understand how government works and how policies are made. Some of this data is already available, but data.gov.uk brings it together in one searchable website. Citizens can search for particular information (e.g. all protected sites). There are also several applications available, e.g. to find the closest pharmacy. Problems in a particular area can be reported, e.g. for a particular postcode (FixMyStreet). It is also possible to visualise and download data sets. Late August 2011, 858 UK Location metadata records were made available on data.gov.uk from 35 data providers across the UK.

2.6.2 Network services

2.6.2.1 Discovery services

From April 2011, the discovery service Gigateway is replaced by the UK Location Programme metadata discovery service.

Next, EDINA provides distributed geospatial information services for the education and research sector, in collaboration with JISC and others. The principle platform is Go-Geo. This provides a discovery service against a number of existing Metadata, Catalogues, including the GI-Gateway (for which EDINA provide hosting services) and NERC.

2.6.2.2 View services

View services are available for SPIRE and MAGIC. MAGIC is a DEFRA-led project provides a one-stop shop for rural and countryside information, bringing together definitive rural designation boundaries and information about rural land-based schemes into one place. Over 60 datasets are organized into 7 frameworks from the Environmental Agency, the Forestry Commission, the Ordnance Survey, English Nature, English Heritage and the Countryside Agency. It incorporates the Coastal and Marine Resources Atlas and is linked with the National Biodiversity Network. Some of the datasets are downloadable for example: agricultural land classification, nuclear power stations, national parks and trails, marine pollution control zones, etc.

By the end of August 2011, view services were in place for 84 INSPIRE datasets (42%) and even more for non-INSPIRE data (in May 2011 only 13 were reported in the INSPIRE MR).

2.6.2.3 Download services

Some examples are:

- Maps on Tap led by ODPM
- The Spatial Information Recovery (SPIRE) programme led by DEFRA; SPIRE is primarily a data repository for geospatial environmental information. It offers a range of search, view and downloads services for the DEFRA Network and other authorised users.
- MAGIC: offers similar search, view and download facilities to SPIRE, but with its own data management processes and data storage. (http://www.magic.gov.uk/).
- Seazone, a commercial service, provides access to hydrographic and other marine and coastal data in digital form for direct use in Geographical Information Systems. Data products are supplied to international standards and come complete with metadata. SeaZone delivers Hydrospatial harmonised with Ordnance Survey land mapping (Mastermap Topography Layer) for the Thames Estuary to UK Government under SeaZone's Coastal Mapping Improvement Programme.

2.6.2.4 Transformation services

No information was found.

2.6.2.5 Invoking services

No information has been found.

2.6.3 Spatial data services and other services

Ordnance Survey provides a number of spatial data services. For instance, OS OnDemand is a web map service that delivers mapping directly over the web at different scales. OS OpenSpace is an application programming interface allowing the mapping of OS to be displayed on webpages or online application. A free service is available for non-commercial websites and a paid-for service is available for businesses intending to charge for access, track access or build international applications.

A key on-line data access service is the National Land Information Service **(**http://www.nlis.org.uk) through which it is now possible to search for property details online. NLIS provides electronic access to all the official sources of land and property information, across the whole of England and Wales, via a number of competing channels. NLIS users can access electronic information from a range of data providers including, 410 Local Authorities, national parks, Land Registry, the Coal Authority, the

Environment Agency and water companies. Since it went live in early 2001, NLIS has processed over 18 million searches in support of the home-buying public.

The Digital National Framework enables and promotes the integration and sharing of location-based information from multiple sources. It supports the objectives of the UK Location Strategy and the rollout of the UK Location Programme (http://www.dnf.org/).

The National GPS Network (http://www.ordnancesurvey.co.uk/oswebsite/gps/) is a web-based service that provides an essential resource for the Global Positioning System (GPS) user in Great Britain. It is intended for GPS-equipped surveyors (land, hydrographic and engineering surveyors), recreational users and for geographical information systems (GIS) developers who work with Ordnance Survey mapping. The national GPS network offers commercial and free services.

Two of the free services are:

- **OS Net RINEX data server** : OS Net comprises over 100 continuously operating GNSS reference stations spread over the whole of Great Britain.
- **Coordinate transformer** This facility allows users to precisely transform between ETRS89, GPS derived, coordinates and Ordnance Survey National Grid coordinates and heights above mean sea level (Ordnance Datum Newlyn for mainland Britain).

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Two of the free services are:

- **OS Net RINEX data server** : OS Net comprises over 100 continuously operating GNSS reference stations spread over the whole of Great Britain.
- **Coordinate transformer** This facility allows users to precisely transform between ETRS89, GPS derived, coordinates and Ordnance Survey National Grid coordinates and heights above mean sea level (Ordnance Datum Newlyn for mainland Britain).

2.6.4 Conclusions of Component 5

There are more than one discovery services allowing to search for data and services through metadata (e.g. Gigateway, BGS, Edina (replaced in April 2011 by the UK Location discovery metadata service), BGS). View and download services are available. No information was found regarding middleware services allowing data services to be invoked or on transformation services.

Based on these conclusions we score the indicators as follows:

- There are one or more discovery services making it possible to search for data and services through metadata
- There are one or more view services available for visualising data from the themes of the INSPIRE annexes
- There are one ore more on-line download services enabling (parts of) copies of datasets
- There are one or more transformation services enabling spatial datasets to be transformed to achieve interoperability (Not Known)
- There are one or more middleware services allowing data services to be invoked (Not Known)

2.7 Component 6: Thematic environmental data

Environmental data are provided mainly by DEFRA, the Environment Agency and by the Scottish Environmental Protection Agency. Thematic environmental data is a component in the UK modernising government agenda and hence they are part of the UK Location Programme. MAGIC provides an interactive map service for bringing together environmental information from different departments and agencies across government. Defra is the custodian of MAGIC with Natural England managing the service under the direction of a cross-government Steering Group.

Most of the INSPIRE data themes are covered, but some important themes in the INSPIRE MR are still missing (e.g. habitats & biotopes, biogeographical regions, energy and mineral resources).

2.7.1 Conclusions of Component 6

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

- Thematic environmental data are covered by the described SDI-initiative or there is an independent thematic environmental SDI (Partially)

2.8 Standards

SDI-players in the UK adhere quite firmly to ISO/TC 211 and CEN/TC287 and other standards. The use of TOID and the Unique Property Reference Number (UPRN) illustrate the importance given to standardization at the data level.

The British Standards Institute (BSI) has developed many standards of relevance to GI with the support of the user community represented by the AGI. In particular BS7666 is the national standard for street addresses. OS MasterMap is based on a set of standards for national georeferencing called the Digital National Framework (DNF). The DNF (www.dnf.org) brings together all the essential components that make up the essentials of an SDI, reusing existing standards where that is possible. Some of the development has been in collaboration with Ordnance Survey of Northern Ireland and Ordnance Survey Ireland as part of a joint programme to harmonise standards across the three organisations for the benefit of pan-national customers DNF is currently determining its role going forward, within the context of the establishment of the UK Location Programme and development of the UKLII. It is likely to remain a focal point for feature catalogue development and interoperability. GML standards have been adopted by some organisations (OS) and the metadata standard ISO 19115, at least at the discovery level, through UK GEMINI.

The UK Location Programme with its UKLII Blueprint describes in detail the different types of standards as well as the existing collaborative initiatives.

- The e-Government Interoperability Framework (eGIF) provides the standards framework to improve the interoperability of government IT systems
- The DEFRA GI Strategy and SPIRE Programme Data Working Group (DWG) is the corporate shared spatial information services. Common SPIRE Data Standard (extension of UK GEMINI standard etc).
- The National Underground Assets Group (NUAG) is responding to the need to better coordinate and record underground infrastructure – with potential for very significant cost savings
- Atlantis is adopting the DNF principles where each organisation adjusts its own data to better „fit" with others in the initiative so that users can increasingly use the data "out of the box
- The UK Environmental Observation Forum (UK EOF) is developing standards and services for environmental monitoring data.

  The National Policing Improvement Authority (NPIA) is developing information standards for police service information systems in England, Wales and Northern Ireland.

2.8.1 Conclusions of Component 7

Developments of international standards are followed closely and applied. Specific standardisation initiatives occur as well. E.g. Common SPIRE Data Standard (extension of UK GEMINI standard)

Based on these conclusions we score the indicator as follows:

- The SDI-initiative is devoting significant attention to standardisation issues

2.9 Use and efficiency of SDI

The positive outcomes of the cost-recovery and even profit oriented policy on GI and SDI in UK have been the creation of detailed and advanced national geographic databases, with funding by users ensuring that the products are customer driven and that the data is maintained. However, there has also been criticism that such commercially-lead policy is hampering informed governance and the further development of value-added services in the private sector.

Under the e-government initiatives, a clear tendency towards more coordination is present, i.e. the evolution in the direction of a more centrally managed SDI, in which the Ordnance Surveys of Great Britain and LPS of Northern Ireland play a key role.

Two examples are:

The national infrastructure for addresses and streets across the whole of local government in England and Wales. The two major national data-sets behind this infrastructure are the National Land and Property Gazetteer (NLPG) and the National Street Gazetteer (NSG). Based on ISO 19112 and the British Standard (BS) a common specification was designed for both the national and the local implementations. The dataset and processing software also uses other standards such as xml, the UK Metadata standard which is currently being updated for INSPIRE and a set of national standard Data Entry Conventions (de Groot et al., 2009).

Dudley Metropolitan Borough Council's GISMO's SDI provides an internet/intranet based GIS which serves geographic information to different business uses. Access to geographic information is provided through 'Getting Information Simply – Mapping Online', or GIS-MO, an intranet-enabled version of the council's geographical information system (GIS). The SDI is managed by Geographical Management Information Solutions (GMIS) unit – part of Dudley's ICT services. (Schmid and Kemp, 2009).

Other developed services include the National Land Information Service **(**http://www.nlis.org.uk) through which it is now possible to search for property details online. NLIS provides electronic access to all the official sources of land and property information, across the whole of England and Wales, via a number of competing channels. NLIS users can access electronic information from a range of data providers including, 410 Local Authorities, national parks, Land Registry, the Coal Authority, the Environment Agency and water companies. Since it went live in early 2001, NLIS has processed over 18 million searches in support of the home-buying public.

Another example of an end-user application is 'What's in your backyard?" from the Environment Agency. This provides mapped information on the state of the environment at any postcode.

3 Annexes

3.1 SDI addresses & contacts for the United Kingdom

Table: SDI contact list			
	Web address	Organisational mailing address	Over-all contact person: tel./fax/e-mail
AGI - Association for Geographic Information	http://www.agi.org.uk	5 St Helen's Place, Bishopsgate, LONDON, EC3A 6AU, UK	Tel.: +44 (0) 20 7036 0430 Fax + 44 (0) 20 7036 030 Email : info@agi.org.uk Director and CEO : Chris Holcroft Email: Chris.Holcroft@agi.org.uk Tel: +44 (0) 20 7036 0437 Fax: +44 (0) 20 7036 0301 Email: info@gigateway.org.uk
Ordnance Survey Great Britain	http://www.ordnancesurvey.co.uk/	Customer Contact Centre Ordnance Survey Romsey Road Southampton SO16 4GU	Tel. 0845 408 1895. for all business enquiries; Callers from outside Britain should dial +442380792912 Fax : +44 (0) 23 8079 2615. Email:customerservices@ordsvy.gov.uk
Land and Property Services	http://www.lpsni.gov.uk/index.htm	Land & Property Services 1st Floor, Lincoln Building 27-45 Great Victoria Street MALONE LOWER Belfast BT2 7SL Northern Ireland	T: +44 028 90251515 F: +44 028 90251659 Email: LPSBallymena.CIC@dfpni.gov.uk Chief Survey Officer and Director of Operations: Iain Greenway T: +44 (0)28 9025 5702. Email: Iain.Greenway@lpsni.gov.uk mailto:

3.2 List of references for United Kingdom

References used to compile the Country Report	
Web sites:	http://www.privacyinternational.org/survey/phr2002/phr2002-part3.pdf

	http://www.shef.ac.uk/~scgisa/spoleto/craglia.pdf http://forum.europa.eu.int/Members/irc/jrc/eesdi/library?l=/document_repository/spatial_infrastructure&vm=detailed&sb=Title http://wwwlmu.jrc.it/ginie/doc/SDI_final_en.pdf http://www.ec-gis.org/reports/policies.pdf http://www.opsi.gov.uk http://www.ordnancesurvey.co.uk http://forum.europa.eu.int/Members/irc/jrc/eesdi/library?l=/working_groups/policy_legal_aspects/reference_documents&vm=detailed&sb=Title http://forum.europa.eu.int/Members/irc/jrc/eesdi/library?l=/working_groups/standards_architecture&vm=detailed&sb=Title http://www.iggi.gov.uk/achievements_deliverables/wwoinfo.htm http://www.ordsvy.gov.uk http://codazzi4.igac.gov.co/gsdi5/documentos/Uta_Wehn_paper.pdf http://www.gisdevelopment.net/policy/gii/gii0004.htm http://forum.europa.eu.int/Members/irc/jrc/eesdi/library?l=/document_repository/spatial_infrastructure&vm=detailed&sb=Title http://forum.europa.eu.int/Members/irc/jrc/eesdi/library?l=/comments_orientation/ireland&vm=detailed&sb=Title http://www.agi.org.uk/ http://www.ngdf.org.uk/ http://www.cabinet-office.gov.uk/innovation/2002/privacy/report/annex-d.htm http://www.osmaps.org/ http://www.gps.gov.uk/ http://www.gigateway.org.uk/metadata/pdf/gemini_position_paper_final v2.pdf http://www.agi.org.uk/members/reports/pdf/inspire/agiupdate160204_final.pdf http://www.gigateway.org.uk/metadata/pdf/GEMINI_Metadata_Standard_1_Apr_04.pdf

	http://www.ordnancesurvey.co.uk/oswebsite/media/news/2004/july/frameworkdocument.html http://www.ordnancesurvey.co.uk/oswebsite/aboutus/reports/frameworkdocument2004.pdf http://www.publications.parliament.uk/pa/cm/cmhansrd.htm Ordnance Survey (Corporate Plan 2004–07 and Business Plan 2004–05): http://www.publications.parliament.uk/pa/cm200304/cmhansrd/cm040721/wmstext/40721m03.htm#40721m03.html_sbhd7 IDEA 2008): Dudley's got a GIS-MO: project case study. Case http://www.idea.gov.uk/idk/core/page.do?pageId=8428184 http://location.DEFRA.gov.uk/wp-content/uploads/2010/03/MetadataGuidelines2.pdf
Publications:	GINIE: Geographic Information Network in Europe. Spatial data infrastructures: Country Reports FINAL D 5.3.2(b). September 2002. Cameron Easton. One Scotland, One Geography: a Spatial Data Infrastructure for Scotland, Defining the Framework, pp.25, 2006.
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	UK Location Programme Blueprint 2009 108 pages
	K., de Groot, Z., Britt, and S., Brandwood. Achieving a national infrastructure for addresses and streets across government in England and Wales using standards and sound information management principles. The development of the National Land and Property Gazetteer (NLPG) and the National Street Gazetteer (NSG). GSDI 11, 2009.
	G., Schmid and A., Kemp. Implementation of SDIs in the public and private sector: A comparison of opportunities and challenges. GSDI 11, 2009 (Available at: http://www.idea.gov.uk/idk/core/page.do?pageId=8428184)