

## The EU INSPIRE Directive: a Suitable Mechanism to Make Spatial Data (More) Available?

Prof. Dr. Lesley Jane Smith, LL.M.  
University of Lueneburg,  
Faculty of Law and Business,  
Wilschenbrucher Weg 69  
21335 Lueneburg.  
Tel: +49/ 421 63 93 60  
Email: ljsmith@barkhof.uni-bremen.de

Catherine Doldirina, LL.M Eur,  
University of Bremen,  
Admiralstrasse, 136  
28215 Bremen  
Email: kdoldyrina@yahoo.com

### Abstract

Spatial information plays an increasingly important role in the decision-making process at global and European level, particularly in the field of environmental protection. Access to such kinds of information and the compatibility of information storage systems are becoming extremely important issues.

Their importance is currently demonstrated by the development of European initiatives such as GMES and GALILEO that derive their legal bases in part from the Directive on public access to environmental information<sup>1</sup> and the Directive on the re-use of public sector information.<sup>2</sup>

The new Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)<sup>3</sup>

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<sup>1</sup> Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC *OJ L* 41, 14.2.2003, 26–32.

<sup>2</sup> Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information *OJ L* 345, 90–96.

<sup>3</sup> *OJ L* 108/1–14, 25.04.2007. Hereinafter referred to as Directive.

represents a further step in merging and streamlining policy-relevant spatial data and information, with a view to exploiting its full potential in the information society and “space age”.

This paper analyses the provisions and regulatory regime set by of the Directive. It focuses on the interaction between the differing European mechanisms regulating degrees of access to spatial data, including the possible impact of INSPIRE Directive on the availability of spatial information. It concludes with an assessment of the Directive’s practicability in achieving its immediate goals.

The paper analyses the degree to which a restrictive tendency towards accessing spatial information and data is perceivable in Europe’s space policies, particularly through reliance on intellectual property rights (whether belonging to state or private actors). The authors conclude with a few suggestions as to how current and future regulation within the field of accessing information might even be improved.

### Introduction to the Directive: political incentives, drivers, and concerns

As a first step, it is useful to analyse the Recitals of the Directive's Preamble with a view to understanding the background to its drafting and the goals set by the European decision-makers for the Directive.

One of the most crucial incentives of the Directive is to secure storage, maintenance and making available of spatial data within the European Community at the most appropriate level. Furthermore, the Directive aims at establishing a technical means to consistently combine spatial data from different sources and to share them between several users and applications. Some of the other important incentives behind adoption of the Directive are: promotion of unrestricted extensive use of spatial data, facilitation of metadata availability, as well as provision of conditions for use of spatial data.

The following factual incentives and issues led to its adoption. Firstly, the forces behind the Directive are aware that there are a number of problems regarding the availability, quality, organization, accessibility and sharing of spatial information<sup>4</sup> that need to and can potentially be solved by implementation of the Directive itself. Secondly, certain impediments to the full exploitation of the spatial data, such as loss of time and resources in searching for existing spatial data or establishing whether it may be used for a particular purpose,<sup>5</sup> serve as drivers to set up a European spatial data infrastructure that will provide extensive metadata regarding available information, data sets and services.

In order to solve the existing problems regarding the availability, quality,

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<sup>4</sup> Recital (2) Directive.

<sup>5</sup> Recital (15) Directive.

organization, accessibility and sharing of spatial information the Directive is designed to follow certain goals. First of all, given the European Community's aim to integrate environmental protection requirements, the Directive's primary goal is therefore, to "establish a measure of coordination between the users and providers of the information so that information and knowledge from different sectors can be combined".<sup>6</sup> The most important objectives of the Directive are:<sup>7</sup>

- ✓ the most appropriate level of spatial data storage, availability and maintenance;
- ✓ the possibility to combine and share data from different sources;
- ✓ the availability of spatial data "under conditions which do not unduly restrict their extensive use";
- ✓ the availability of metadata that assists evaluation of existing data's suitability for the purpose and provides the conditions applicable to its use.

Furthermore, the infrastructure<sup>8</sup> set up by the Directive will provide interoperability of data generated within different initiatives on the European level (Galileo, GMES, European pollutant emission register, European Transport Policy Information System, etc.) by creating a suitable framework for their storage and sharing.<sup>9</sup>

### **Structure and Analysis of Directive's provisions**

The Directive is divided into 7 Chapters with 3 Annexes.

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<sup>6</sup> Recital (1) Directive.

<sup>7</sup> Recital (6) Directive.

<sup>8</sup> Hereinafter referred to as INSPIRE.

<sup>9</sup> Recital (11) Directive.

The first Chapter “General Provisions” lays down general provisions regarding set-up of INSPIRE. According to Article 1 Directive, its purpose is to lay down general rules in order to establish INSPIRE – European infrastructure for spatial information “for the purposes of Community environmental policies and policies or activities that may have an impact on the environment”. To understand what an infrastructure for spatial information is, a useful definition is provided in Article 3: “metadata, spatial data sets and spatial data services; network services and technologies; agreements on sharing, access and use; and coordination and monitoring mechanisms, processes and procedures, established, operated or made available in accordance with this Directive”. In other words, the availability and access to data has to be constructed as a network.

It is, therefore, clear that INSPIRE is a geographic information system, which in turn constitutes an automated mapping and analysis system that enables the collection, integration and interrogation of vast amounts of data concerning the location of physical entities and of events or activities.<sup>10</sup>

As the Directive is not aimed at encompassing the whole range of information and data sets that (might) exist,<sup>11</sup> Article 4 narrows the subject-matter indicated in Article 1, by laying down cumulative conditions for a data

set to meet, in order to be covered by the Directive, namely that it:

- (a) relates to an area where a Member State has and/or exercises jurisdictional rights;
- (b) is in electronic format;
- (c) is held by or on behalf of a public authority (that has produced, received or is managing or updating it), or a third party to whom the network has been made available in accordance with Article 12 Directive (i.e. their spatial data sets or services comply with the implementing rules);
- (d) relates to one or more of the themes listed in Annex I, II or III Directive.

Article 2 lays down an important principle that will be returned to later in this analysis – the Directive does not affect the existence or ownership of public authorities’ intellectual property rights.

Article 3 gives the list of definitions of the most important terms used by the Directive: as mentioned above “infrastructure for spatial information” and “spatial data set”, “spatial data”, “spatial data services”, “spatial object”, “metadata”, “interoperability”, “INSPIRE geo-portal”, “public authority” and “third party”. These will be introduced during the analysis in context, but the last two are particularly important in that they demarcate questions of ownership, regulation and finally access to information, data sets and services. For this reason, they are given separate treatment below.

The term ‘public authority’ includes three groups of subjects: any government or other public administration, as well as public

<sup>10</sup> Frost & Sullivan, Executive Summary: World Geographic Information Systems (GIS) Software and Service Markets 1-3 (1994), cited in Harlan J. Onsrud & Robert I. Reis, Law and Information Policy for Spatial Databases: A Research Agenda, 35 *Jurimetrics Journal* 377-393 (1995).

<sup>11</sup> INSPIRE may be, nevertheless, used for other than environmental purposes and in other fields of data applications. See Explanatory Statement.

advisory bodies, at all levels;<sup>12</sup> any natural or legal person performing public administrative functions under national law; and any natural or legal person having public responsibilities or functions, or providing public services relating to the environment under the control of either above. The “third party” notion encompasses all other subjects that cannot be regarded as public authorities.

The second Chapter “Metadata” is devoted to the issues related to metadata, which is information that describes spatial data sets and services, thus “making it possible to discover, inventory and use them”. Article 5 imposes an obligation on the Member States to ensure creation and update of metadata. Its second paragraph indicates what metadata shall include content-wise:

- (a) the conformity of spatial data sets with the Directive’s implementing rules;
- (b) conditions of access to and use of spatial data sets and services; as well as corresponding fees in relevant cases;
- (c) the quality and validity of spatial data sets;
- (d) the public authorities responsible for spatial data sets and services;
- (e) limitations on public access and their reasons.

Article 6 thereafter sets the timetable for creating metadata: 2 years for the items listed in Annexes I and II, and 5 years for those from Annex III.

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<sup>12</sup> Member States may provide that when bodies or institutions are acting in a judicial or legislative capacity, they are not to be regarded as a public authority for the purposes of the Directive.

The third Chapter “Interoperability of Spatial Data Sets and Services” deals with interoperability, which according to Article 3 (7) Directive is “the possibility for spatial data sets to be combined, and for services to interact, without repetitive manual intervention, in such a way that the result is coherent and the added value of the data sets and services is enhanced.” It lays down the most important milestones regarding the interoperability of data, the technical aspects of the infrastructure set-up, as well as the implementing rules.

The fourth Chapter “Network Services” lays down the legal framework of the network services that have to be provided according to the Directive. A spatial data service is deemed to be an operation “which may be performed, by invoking a computer application, on the spatial data contained in spatial data sets or on the related metadata”.<sup>13</sup> Article 11 lists the services, an operation network for which has to be established: discovery, view, download and transformation services, as well as services allowing spatial data services to be invoked. Article 13 lays down the restrictions on access to spatial data sets and services (under Article 11) that are to be interpreted restrictively, taking into account the public interest in the provided services. Access to the viewing services can be restricted if it would adversely affect international relations, public security or national defence. In addition to this condition access to all other services can be restricted in any of the following cases:<sup>14</sup>

- (a) the confidentiality of the proceedings of public authorities, of commercial or industrial

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<sup>13</sup> Article 3 (4) Directive.

<sup>14</sup> The numbering here does not correspond to that in the Article.

information, as well as of personal data and/or files relating to a natural person, when provided for by law;

- (b) the course of administration of justice;
- (c) intellectual property rights;
- (d) the interests or protection of any person who supplied the information requested on a voluntary basis without being under, or capable of being put under, a legal obligation to do so, unless that person has consented to the release of the information concerned;
- (e) the protection of the environment to which such information relates (e.g. the location of rare species).

Article 14 imposes the obligation on Member States to ensure that discovery and viewing services are available to the public free of charge. Its second paragraph, though, allows the Member States to charge fees to secure maintenance of spatial data sets and data services, “especially in cases involving large volumes of frequently updated data”. Beyond this, viewing services may be presented in a form preventing commercial re-use of the data sets viewed. Article 15 obliges the Commission to establish an INSPIRE geo-portal at Community level (in the form of a web-site that would provide access to relevant services), through which also the Member States shall provide services.

The fifth Chapter “Data-Sharing” regulates the issue of data-sharing between the public authorities of Member States. Its Article 17 states that the Member States shall adopt measures that will enable public authorities and private persons acting on their behalf to

gain access to spatial data sets and services, to use and exchange them, when performing public tasks. Simultaneously, its paragraph 3 allows Member States to introduce charges for exchange of data sets and services among public authorities, although these have to be kept at an absolute (required) minimum, and are not applicable to the reporting obligations of the public authorities under the Community legislation relating to environment.

Chapters six (“Coordination and Complementary Measures”) and seven (“Final Provisions”) regulate the institutional set-up and the interrelationship between the state and Community authorities, as well as set deadlines of implementation and reporting. The reports Member States will have to submit to the Commission have to contain following information:

- (a) the coordination of public sector providers, users and intermediary bodies; relationship with the third parties and the quality assurance organisation;
- (b) authorities’ or third parties’ contribution to the functioning and coordination of INSPIRE;
- (c) information on the use of INSPIRE;
- (d) data-sharing agreements between public authorities;
- (e) the costs and benefits of implementing this Directive.

The Annexes list the spatial data themes that have to be included into INSPIRE, such as coordinate reference systems, geographical grid systems, geographical names, administrative units, transport networks, digital elevation models for land, ice and ocean surface, physical and biological cover of the earth’s surface, geo-referenced image data of the Earth’s surface (from satellite and airborne sensors), statistical units, soils and subsoil characteristics, land use

information, human health and safety, environmental monitoring facilities, agricultural and aquaculture facilities, natural risk zones, meteorological geographical features, habitats and biotopes, mineral resources, etc.

After the previous introduction to the incentives behind the Directive's adoption and a brief look at its more detailed provisions, the following section provides an analysis of their combined effectiveness.

### **Correlation of the goals set up within the Directive and the tools provided to achieve them**

As previously indicated, the main aim of the Directive is to create a legal framework for the establishment and operation of INSPIRE. The objective of the infrastructure is to make "more and better spatial data available for Community policy-making and implementation of Community policies in the Member States at all levels".<sup>15</sup> This section attempts to analyse whether the mechanisms the Directive provides for the establishment and maintenance of the INSPIRE will suffice to ensure availability, quality, organization, accessibility and sharing of spatial information.

Work on the draft Directive and consultation procedures took almost five years.<sup>16</sup> In the final stages of the negotiations on the draft of the Directive the main issues discussed by the

<sup>15</sup> Explanatory Statement, A6-0021/2007, January 31, 2007. Hereinafter Explanatory Statement.

<sup>16</sup> The process was initiated in 2002, see INSPIRE Memorandum of understanding between Commissioners Wallström, Solbes, Busquin, 11 April 2002, D (02) 330523, available at <http://www.ec-gis.org/inspire/reports/MoU.pdf>.

European Parliament and the Council were: "intellectual property rights and costs; exemptions from obligations to provide data; type of data provision services and access to these; meta-data and data definition; scope of the Directive; deadlines for its implementation".<sup>17</sup> Sadly enough, the main points of dispute (level of charges for data and intellectual property rights) were not resolved during the debates. This is clearly seen in the text of the Directive adopted: in regard to intellectual property regime it operates only with the references to the substantive laws of the Member States;<sup>18</sup> with regard to charges, it only mentions that these must "be kept to the minimum required to ensure the necessary quality and supply of spatial data sets and services together with a reasonable return on investment".<sup>19</sup>

Given its aim to remove practical obstacles to information availability<sup>20</sup> the Directive empowers the Commission *inter alia* to adopt implementing rules laying down technical arrangements for the interoperability and harmonisation of spatial data sets and services, alongside rules governing the access conditions to data sets and services.<sup>21</sup> The latter are being criticised as giving the Commission too much leeway to establish uniform charges for accessing data and obtaining services under the infrastructure.<sup>22</sup>

The Directive further lays down – in regard to conditions of access to spatial

<sup>17</sup> Explanatory Statement.

<sup>18</sup> See Art. 2, 4 (5), 13 (1) (e) Directive, more to that see below at.

<sup>19</sup> See Art. 17 (3) Directive.

<sup>20</sup> Recital (21) Directive.

<sup>21</sup> Recital (33) Directive.

<sup>22</sup> See Modifying the INSPIRE Directive, Public Geo Data Report, available at [http://space.frot.org/docs/inspire\\_directive.html](http://space.frot.org/docs/inspire_directive.html).

information and data sets – that a minimum number of services within INSPIRE: services for discovering information and viewing spatial datasets (subject to certain specific conditions), must be made available to the public free of charge.<sup>23</sup> This is, however, considered to be insufficient, given that in a lot of cases, the information is effectively useless where it cannot be downloaded.<sup>24</sup> Moreover, the “certain specific conditions” of data availability under these services are not spelt out in the Directive’s provisions.

With regard to charges’ issue, the initial wording of Article 14 that allowed imposition of charges for viewing and discovery services only in case of their indispensability for the operation / maintenance of data sets has been dropped. This turn follows the tendency also in existence in the USA, where local governments undermine open record laws by selling publicly-held geographic information and services.<sup>25</sup>

The Directive does not impose duties requiring the collection of new or future data,<sup>26</sup> with the result that data not readily available, but nevertheless required for the effective operation of INSPIRE, can only be acquired through other projects that authorise generation of data.

The Directive is further lacking, in that it contains no provisions relating to how licences of information and data sets, as well as services, are to be handled. It

merely states that Member States may impose licences, including click-licences and disclaimers in case of providing e-commerce services for charged services under Article 11(1) (b), (c) or (e).<sup>27</sup> But the definition of INSPIRE includes “agreements on sharing, access and use”,<sup>28</sup> which would normally require license sharing provisions to be incorporated into the legal document governing such an infrastructure.

### **Directive and the regime of information protection in the EU**

The Directive does not aim to regulate the intellectual property rights regime applicable to the data sets, information and services that will become available once the infrastructure is established. This is because the Directive has no influence on the existence or ownership of public authorities’ intellectual property rights.<sup>29</sup> It reiterates the principle that, if the spatial data is obtained by a public authority from a third party, holding intellectual property rights in respect of such data, the public authority may use these data only with the consent of that third party.<sup>30</sup>

Such an approach to regulation presupposes the application of Community and national legislation on intellectual property rights such as exist in the data sets and information included into INSPIRE. Therefore, provisions of such Directives as Copyright Directive,<sup>31</sup>

<sup>23</sup> Recital (20) Directive.

<sup>24</sup> See Modifying the INSPIRE Directive, Public Geo Data Report, note 22.

<sup>25</sup> H.B. Dansby, A Survey and Analysis of State GIS Legislation, *GIS LAW*, Spring 1992, at 7-13. H.J. Onsrud, In Support of Open Access for Publicly Held Geographic Information, *GIS LAW*, Spring 1992, at 3.

<sup>26</sup> Recital (13) Directive.

<sup>27</sup> Article 14 (4) Directive.

<sup>28</sup> Article 3 (1) Directive.

<sup>29</sup> Recital (9) Directive.

<sup>30</sup> Article 4 (5) Directive.

<sup>31</sup> Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society *OJ L* 167/10, 22.6.2001.

Rental and Lending Rights Directive,<sup>32</sup> Term Directive,<sup>33</sup> Computer Programmes Directive,<sup>34</sup> as well as Database Directive will be applicable to the acts (such as making information available, sharing and re-use) regarding spatial information and data sets. Industrial property Community legislation<sup>35</sup> may be also applicable

Although there is extensive Community legislation relating to intellectual property rights, none of its rules provide for an overall harmonised regulation of this sphere. This is principally due to the limited powers of the European Union to regulate substantive aspects of intellectual property rights: the Community institutions can only lay down harmonised rules regarding modes and patterns of intellectual property rights use, but, following Article 295 EC Treaty,<sup>36</sup> may not regulate their existence at national levels. The legislative technique employed in the

majority of Directives does not generally prescribe full implementation of all provisions into national legislation, but leaves Member States with a degree of freedom in deciding the scope of implementation of non-mandatory norms of the Directives. The Copyright Directive perfectly illustrates this technique: the exhaustive list of exceptions and / or limitations on the rights of authors and other rightholders it contains does not have to be fully implemented by the Member States.<sup>37</sup> The only mandatory exception concerns the right of reproduction and covers transient or incidental temporary acts of reproduction.<sup>38</sup>

The Directive operates with the term “spatial data set”, never using the term “database”, although the definition of the “data set” – “an identifiable collection of spatial data”<sup>39</sup> – is very close to that of “database” – a “collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means”.<sup>40</sup> The decision not to use the traditional term “database” is surprising, as it questions the protection granted to creators and/or owners of databases under the Database Directive.<sup>41</sup> If the provisions of the Database Directive are applicable to INSPIRE, it may well fall within the definition of database and be eligible for protection under the *sui generis* database right:<sup>42</sup> this does not

<sup>32</sup> Directive 2006/115/EC of the European Parliament and of the Council of 12 December 2006 on rental right and lending right and on certain rights related to copyright in the field of intellectual property (codified version) *OJ L* 376, 27.12.2006, 28–35.

<sup>33</sup> Directive 2006/116/EC of the European Parliament and of the Council of 12 December 2006 on the term of protection of copyright and certain related rights (codified version) *OJ L* 372, 27.12.2006, 12–18.

<sup>34</sup> Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs *OJ L* 122, 17.5.1991, 42–46.

<sup>35</sup> E.g for trademarks – Council Regulation (EC) No 1992/2003 of 27 October 2003 amending Regulation (EC) No 40/94 on the Community trade mark to give effect to the accession of the European Community to the Protocol relating to the Madrid Agreement concerning the international registration of marks adopted at Madrid on 27 June 1989 *OJ L* 296, 14.11.2003, 1–5.

<sup>36</sup> Treaty Establishing the European Community, Consolidated version *OJ C* 325, 24.12.2002.

<sup>37</sup> Article 5 (2)-(4) Copyright Directive.

<sup>38</sup> Article 5 (1) Copyright Directive.

<sup>39</sup> Article 3 () Directive.

<sup>40</sup> Article 1 (2) Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases *OJ L* 331E, 31.12.2002, 313-318. Hereinafter Database Directive.

<sup>41</sup> See note 37 for reference.

<sup>42</sup> Chapter III Database Directive.



necessarily facilitate access to information, which a database contains, nor to its sharing, or especially its re-use. The latter would seem to hold true because of the high level of protection given by a broad right of database makers “to prevent extraction and/or re-utilization of the whole or of a substantial part, evaluated qualitatively and/or quantitatively, of the contents of that database”.<sup>43</sup>

As INSPIRE has not yet been established, it is difficult to assess whether such limitations on rights will in fact facilitate access to information and data sets under INSPIRE, or whether the utilisation practice will lead to the interpretation of the data sets as databases in the sense of the Database Directive. But the absence of substantial intellectual property rights’ regulation and the reference of the Directive to the existing copyright laws suggest that such an interpretation is possible: the Database Directive is part of the relevant *acquis*.

The question of what intellectual property regime will be applicable to the information and data sets contained in INSPIRE is a vital one, as protection of maps was never an easy issue.<sup>44</sup> Digitalisation of the spatial information within INSPIRE makes the problem even more difficult to solve from the theoretical point of view, as digital form does not enjoy a well-defined protection as property. Finally, “resolving rights in spatial databases implicates the theoretical shortcomings of copyright law both as applied to geographic

representations and to computer representations.”<sup>45</sup>

It is, however, clear, that the inability of the Directive to regulate existence of copyright and other intellectual property rights leaves both data-generators and users with the problem of protecting information in practice, an issue unresolved by existing European and national laws. The operation of the INSPIRE will involve extensive use of non-copyrightable, but essential information, data sets and services. It does seem that a solution should be found to the paradox of technical availability of data, yet legal obstacles to accessing it only against payment.

### Conclusion

Given that the Directive was only adopted in May 2007 it is hard to predict whether the new regime of operation subsequent to implementation will be successful or not. INSPIRE will be operative only as from 2009. The first implementation reports of the Member States are due to be submitted to the Commission by May 15, 2010. They will illustrate whether the most disputed provisions of the Directive – concerning intellectual property rights and charges for the services provided in the framework of INSPIRE – can be solved in practice, and if so, then in what way. In the meantime, at least those spatial data interest communities (SDIC) and those legally mandated organisations (LMO) that have registered their interests are preparing to cooperate and

<sup>43</sup> Article 7 Database Directive. The database has to meet requirement of a substantial investment set by this Article to be protected under the *sui generis* regime.

<sup>44</sup> Dennis S. Karjala, Copyright in Electronic Maps, 35 *Jurimetrics Journal* 395 (1995).

<sup>45</sup> Onsrud H.J, Reis R.I., Law and Information Policy for Spatial Databases: A Research Agenda, 35 *Jurimetrics Journal* 377-393 (1995).

develop the implementing rules.<sup>46</sup> Whether, however, such a technical structure to what is in principle an area of information organisation, archiving, and accessibility will at the end fulfil the objective of making such information easily accessible, remains a high hurdle to clear.

Reports by Member States on the implementation, as well as operation, phases<sup>47</sup> will shed more light with regard to the effectiveness of the legal basis that the Directive provides for INSPIRE. Provided implementation and operation monitoring are carried out, the empirical data on implementation may be available for analysis even before the reports are submitted to the Commission.

What has not yet been clarified is the degree to which information and information services gathered and delivered by public hand should be subjected to copyright at all. Giving access to information with one hand and taking it away by demanding licenses is nothing more than straight business rather than legal logic for access in the information society. The theoretical question, whether the public interest will be best served by letting governments charge for information or allow its maximum flow into commercial sector, will remain practically unanswered until substantial experience in handling these matters is gained. Political and legal basis for either of the approaches has to incorporate regulation with regard to such issues as publicly-generated

information availability and economic necessity of charges.<sup>48</sup>

As research shows,<sup>49</sup> the problem of protection is an agenda item but has not found its effective resolution for at least past 15 years. In any case, leaving a gap in the regulation of spatial infrastructures' regime by not addressing issues of information access and re-use conditions is not an approach to be recommended for wholehearted adoption, either in Europe or elsewhere.

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<sup>46</sup> The open call for registration was launched on March 11, 2005. More info at <http://www.ec-gis.org/inspire/ir/index.cfm>.

<sup>47</sup> Although first of them are due first not later than May 15, 2013.

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<sup>48</sup> D. Rhind, Data Access, Charging and Copyright and Their Implications for GIS, in EGIS 91 929-45, reprinted in 6 *International Journal of Geographical Information Systems* 13 (1992); H.J. Onsrud, In Support of Cost Recovery for Publicly Held Geographic Information, *GIS LAW*, Summer 1992, at 1. See also H.J. Onsrud, In Support of Open Access for Publicly Held Geographic Information, *GIS LAW*, Spring 1992, at 3.

<sup>49</sup> See note 48 above. The articles were written in the beginning of nineties, but the issues they raise are still not properly addressed.