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**Invited papers on recent developments in geospatial information  
management in addressing national, regional and global issues**

**Institutional Arrangements In Geoinformation:  
Influence of Legal and Policy Issues \*\***

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**Institutional Arrangements In  
Geoinformation: Influence of Legal and  
Policy Issues**

**Prepared by the Centre for Spatial Law and Policy**

## **Executive Summary**

It has become clear that geospatial information (“geoinformation”) can play a critical role in spurring economic growth and productivity, enhancing governance and improving a citizen’s quality of life. As a result, governments around the world are striving to develop a policy and legal framework that addresses the collection, use, visualization, analysis, distribution, storage, and retention of geoinformation (collectively, “geoinformation management”). Such frameworks will become even more important in the future, as the cost of collecting, using, storing and distributing geoinformation decreases and geoinformation is used in applications such as intelligent transportation systems (ITS), smart grids and smart cities for critical, real-time decision-making.

A wide range of policy and legal issues impact geoinformation management. A comprehensive picture of the impact that these issues have on geoinformation management is beginning to emerge due to a recent survey conducted by the United Nations Global Geospatial Information Management (UN-GGIM) staff and the Centre for Spatial Law and Policy. An analysis of the survey results indicates that policy and legal issues present a major challenge to government agencies around the world as they try to collect, use and distribute geoinformation. These issues concern privacy, license and data sharing agreements, liability concerns and national security. Anecdotal evidence suggests that the private sector, non-governmental organizations (NGOs) and universities struggle with many of the same issues.

In order to improve geoinformation management, nations should consider a comprehensive review of the extent to which legal and policy issues impact the collection, use, storage and distribution of geoinformation within their respective countries. It is important to begin to address these issues now, because they will become more complex as applications involving geoinformation become more common and additional stakeholders emerge. Representatives from government, industry, universities and NGOs should be included in this process, since each group is both a provider and a consumer of geoinformation. Such a review should include all relevant potential sources including laws, policies, regulations, directives, procedures, court cases, license agreements, international treaties and agreements and even national constitutions.

Upon completion of the review, the stakeholders can begin to consider ways to address the issues within each nation’s existing legal and policy framework. In some cases this may simply require educating lawmakers, policymakers and lawyers on geospatial technology and the value of geoinformation management so they can make informed decisions and provide sound advice. Some nations may wish to create new laws and policies, while others may decide to

address the issues by clarifying how existing laws and policies will apply to geospatial technologies and/or applications that use geoinformation.

One of the most significant challenges will be to align the institutional arrangements within government to address these issues. These issues cut across both technology platforms and policy/legal/regulatory domains. As a result, they often fall under the remit of a number of different government agencies. For example, satellite imagery can be used in a number of ways, including monitoring the environment, protecting national security and for commercial purposes. However, earth observation satellites will often fall under the authority of one or two government agencies. One government agency's perspective on the benefits and risks associated with the distribution and use of satellite imagery will often differ from the perspective of another government agency. For example, an agency responsible for national security will often favor more restrictive measures on information sharing than an environmental agency. Similarly agencies responsible for data protection/privacy will often focus on the privacy risks associated with data collection and use, while agencies with large GIS departments will often focus on the potential benefits of being able to visualize and analyze a wide variety of data sets. Aligning these conflicting and often competing interests through institutional arrangements will be critical.

Moreover, government agencies are increasingly relying upon the private sector for geoinformation. Therefore, government agencies will need to understand commercial business models and related matters such as commercial licensing terms. In addition, crowdsourced data will become more important for a variety of governmental purposes. Institutional arrangements will need to address this new paradigm. For example, it will be critical to understand how efforts to regulate or restrict the collection of geoinformation by the private sector will impact the ability of government agencies to perform their missions. In addition, institutional arrangements should be put in place to consider the privacy of citizens and the intellectual property rights of the private sector.

## **Policy and Legal Challenges**

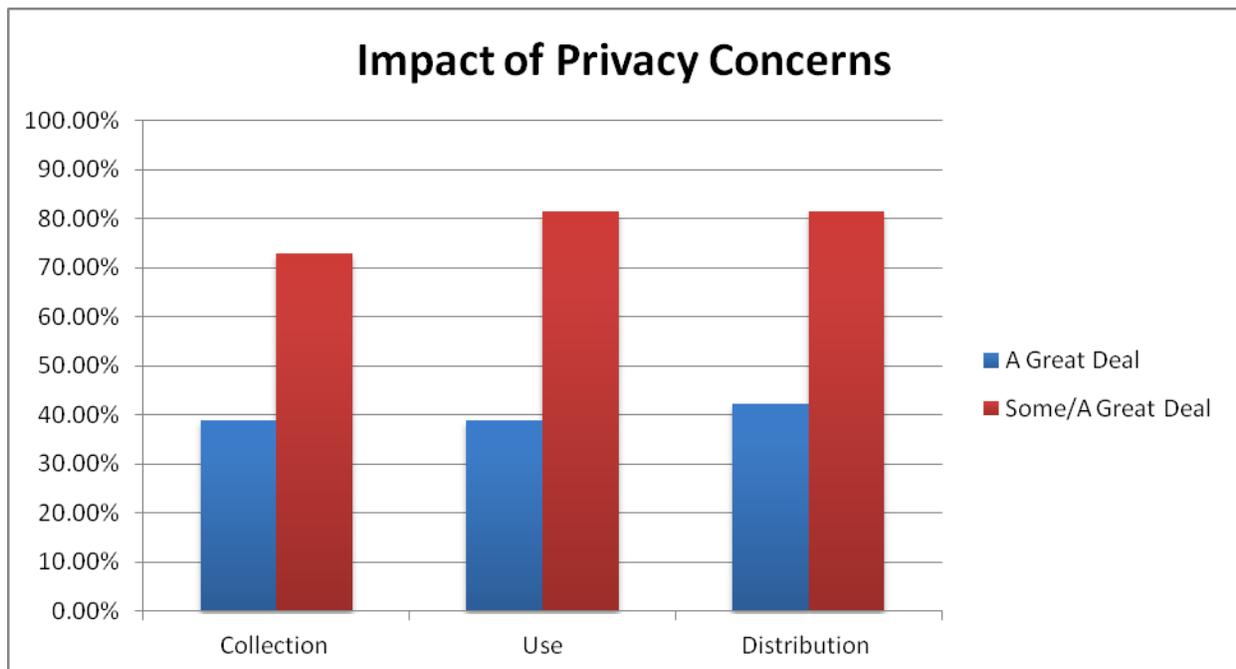
While a location-based society is now achievable from a technology standpoint, there are a number of legal and policy challenges that must be addressed by nations in order to maximize the benefits of geoinformation while still protecting governments, citizens and the private sector against potential risks. These challenges have arisen in part because the legal and policy communities have been unable to keep up with the rapid adoption of geospatial technology and growth of applications that utilize geoinformation. As a result, laws and policies that impact the collection, use, storage and transfer of geoinformation are often unsettled or unclear. Working through these issues will take time and cannot be addressed solely by government. Solutions will require the active participation of the broader geospatial community within a nation. Moreover, it is critical to begin addressing these issues now as they will become even more complex and difficult as new technologies and applications develop.

Recently, the UN-GGIM and the Centre for Spatial Law and Policy conducted a survey of the impact that legal and policy issues have on global geoinformation management (the “Survey”). As of June 3, 2013, approximately sixty members had responded to the Survey. The responses highlight the significant impact certain legal and policy issues are having on geoinformation management world-wide. Because the issues are so varied, addressing them will require more than implementing a single law, policy, and/or a directive. Rather, it will require understanding and addressing the full range of policies, laws and regulations that impact the collection, use, storage and distribution of geoinformation.

### **Privacy**

As the collection and use of geoinformation has increased, so have data protection and privacy concerns associated with geolocation information. Most data protection/privacy laws and regulations were introduced before geolocation information became widely available. It is proving very difficult to apply existing data protection and privacy laws to geoinformation. As a result, there is a great deal of uncertainty associated with what geoinformation should be protected, how it should be protected and who should be responsible for such protection. For example, in the United States a number of people expressed concerns over privacy when a newspaper published a map of gun owners even though records of gun ownership were publicly available information. Similarly, governments around the world are struggling with how to apply existing laws and policies to new geospatial technologies, such as unmanned aerial vehicles.

As the chart below indicates, this uncertainty regarding geolocation privacy makes it difficult for government agencies to collect, use and or distribute geoinformation products and/or services:



Developing a legal and regulatory framework around geolocation privacy will be an important aspect of geoinformation management. Such a framework must balance the benefits of geoinformation with risks associated with improper collection, use or sharing of geoinformation. Government agencies are – and should be - particularly sensitive to these issues because if citizens feel that their civil liberties are being violated by government’s improper use of their geolocation information, they will be unlikely to take full advantage of geospatial technology. This could hamper the development of “location-enabled” societies.

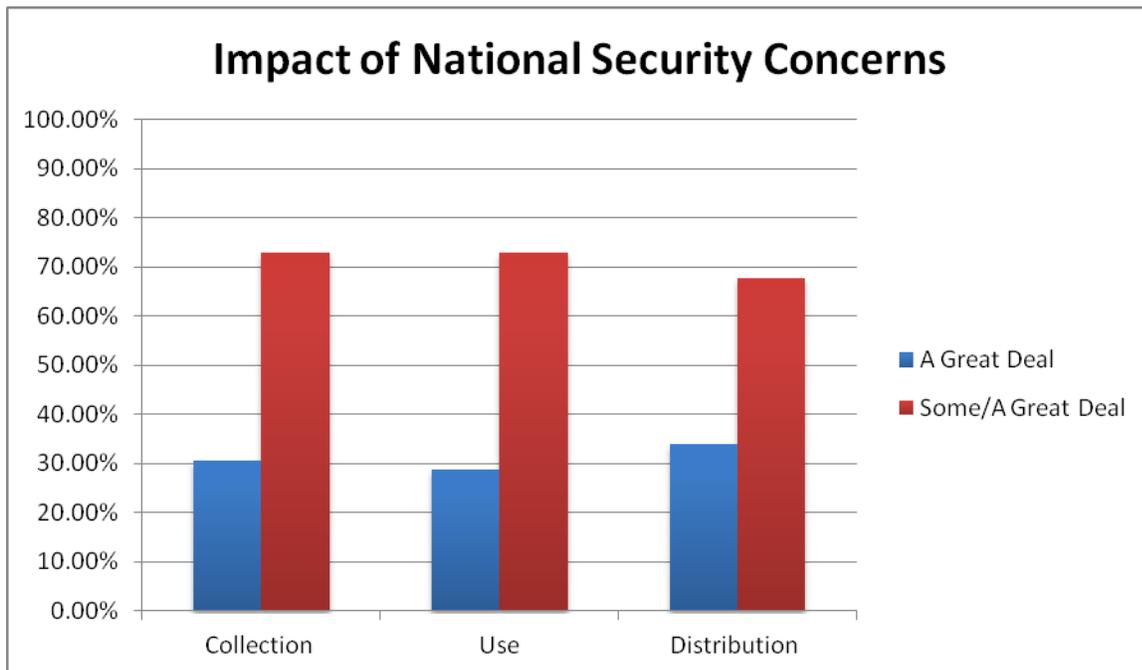
The challenge will be to develop a legal and regulatory framework that addresses these data protection/privacy risks while not making it unnecessarily difficult to collect, use, store or transfer geoinformation. An important first step will be to clearly define and articulate the privacy concerns. For example, the privacy concerns associated with the use of a tracking device to stalk an individual (and the legal mechanism for protecting against such acts) are often different than those associated with receiving unwanted advertisements on a mobile device based upon a person’s location. It will also be important to consider whether existing legal and regulatory privacy/data protection constructs are proper to protect geolocation information.

Moreover, such a legal and regulatory framework should consider the opportunity costs associated with not collecting geolocation information. For example, while someone may use the location of someone’s device to violate an individual’s privacy, a first responder or loved one may use that same information to find and/or communicate with them during an emergency. If

privacy/data protection policies make it too expensive or difficult to collect geolocation information for one purpose, it likely will not be available for other more beneficial purposes.

### National Security

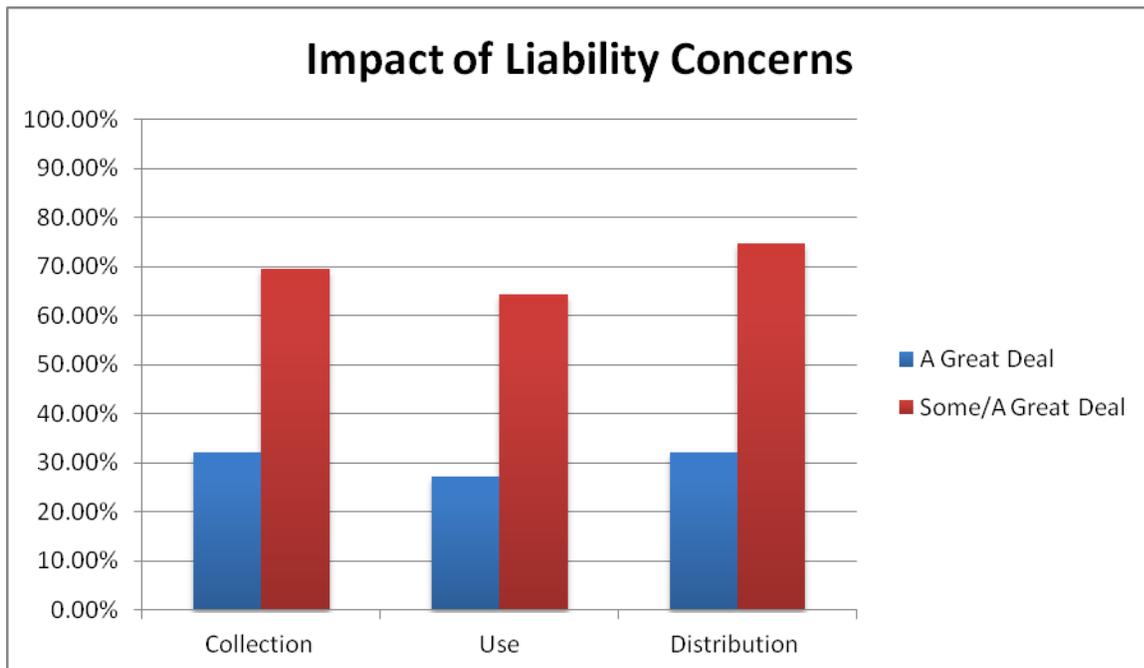
Defence and intelligence agencies world-wide have expressed concerns that certain geoinformation can be used to threaten a nation’s security. As a result, a number of nations have imposed restrictions on geoinformation management for national security reasons. These restrictions arise in variety of contexts. For example, some countries have placed resolution restrictions on commercial imaging satellites. Some restrict the right of citizens to update non-governmental maps with local knowledge. Others have placed restrictions on mapping activities or the export of geoinformation. According to the Survey results, these national security restrictions are having a considerable impact on geospatial information management by government agencies:



A geoinformation management legal and regulatory framework will need to balance the perceived national security risks with the growing economic and societal benefits associated with geospatial technology. While national security risks must not be discounted, the benefits of geoinformation are becoming clearer and must be considered. As a result, an appropriate legal and policy framework will minimize to the greatest extent possible the impact national security restrictions have on the broader collection and use of geoinformation.

### Data quality

One of the unique attributes of spatial data is its versatility; a single data set can be used for a number of different applications. However, the quality of the data (accuracy, timeliness, precision, completeness, etc.) may not be sufficient for all such applications. The potential liability issues associated with poor data quality become even more important as geoinformation is used for more critical, and increasingly real-time, decision-making. Unfortunately in most countries the law with respect to liability for data errors – particularly for digital products and services – is not well developed. This creates a great deal of legal uncertainty and as the chart below indicates, this uncertainty can have a chilling impact on the collection, use and distribution of geoinformation by government agencies.

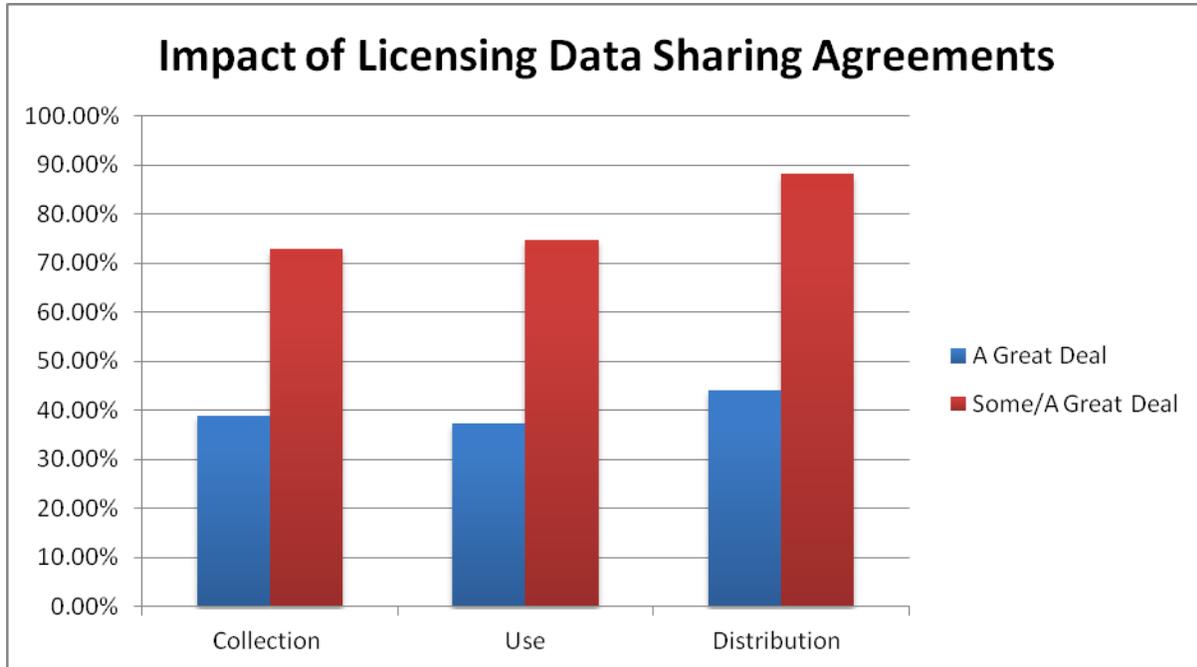


Some have explored legislation that would try to regulate data quality and impose penalties for poor data quality. However, a broad effort to legislate or regulate geoinformation data quality will be difficult, given the number of different types of stakeholders involved. Also, it will likely prove difficult to determine what level of data quality is required for a particular application, particularly since many applications are relatively new. As a result, the challenge will be to not impose overly burdensome data quality requirements on an emerging high growth industry.

### **Conforming Licensing/Data Sharing Agreements**

Increasingly geospatial products and services are created using data from many different sources. These data types may include government data, commercial and/or proprietary data and data collected by or from citizens. Geoinformation is often transferred between organizations through license or data sharing agreements. Often each data type will be subject to its own

licensing/data sharing agreements, with varying terms, restrictions and conditions. As the chart below indicates, abiding by the terms and conditions of these various licensing/data sharing agreements poses a significant challenge for government agencies in geoinformation management.



One of the primary purposes of license/data sharing agreements is the transfer of certain intellectual property rights in the data from one party to another. Licensing of geoinformation has become complex in part because of the challenge of protecting intellectual property in a digital world. In addition, determining the extent of intellectual property rights in data is not as straightforward as it is with other types of property. For example, determining the copyright protection afforded a database is more difficult than with computer software. Also, trying to conform legal terms such as “derived products” with geospatial terms such “geocoding” is a challenge. Such uncertainty increases the chance of disputes and even lawsuits, particularly as parties recognize the value of geoinformation databases. As a result, government agencies are often very cautious with geoinformation so as not to end up in court.

There are a number of initiatives to develop a single or series of standard license/data sharing agreements for the transfer of geoinformation. Some government agencies have begun to release government data under such agreements. While such efforts are praiseworthy, it is still too early to tell whether such license agreements will achieve broad adoption by both data providers and data users.

### **Developing the Proper Institutional Arrangements**

In order to address the issues described above, it will be necessary to align the institutional arrangements within nations. As discussed above, since these issues cut across both

technology platforms and legal/policy domains, the addressing them will often involve the participation of a number of different government agencies. For example, satellite imagery can be used for a variety of purposes. It is critical for weather forecasts and monitoring the environment. Satellite imagery is also critical for military and intelligence purposes. In addition, satellite imagery is now being used in a number of civil and commercial applications. However, often the budget and regulatory authority concerning the operation of earth observation satellites will fall under the domain of one or two government agencies. The perspective of these agencies on the relative benefits and risks of collecting and sharing earth observation data will often differ from the perspective of other government agencies. For example, an agency responsible for homeland security or collecting intelligence will often favor more restrictive measures on information sharing than an agency responsible for protecting the environment. Similarly government agencies with a primary responsibility for data protection/consumer privacy will often focus on the privacy risks associated with data collection while not fully appreciating the benefits associated using and aggregation geoinformation. Without informed and active coordination and communication between government agencies, there is a risk of overregulation or a failure to appreciate the unintended consequences of well-intentioned policies, laws and/or regulations.

Moreover, government agencies are increasingly relying upon the private sector for geoinformation. Therefore, government agencies will need to better understand commercial business models and related matters such as commercial licensing terms. In addition, crowdsourced data will become more important for a variety of governmental purposes. Laws and policies will be needed to address this new paradigm. For example, it will be critical to understand how efforts to regulate or restrict the collection of geoinformation by the private sector will impact the ability of government agencies to perform their missions. Overly restrictive measures with respect to private industry would inevitably reduce the availability of geoinformation for government purposes. In addition, institutional arrangements should be put in place to consider the privacy of citizens and the intellectual property rights of the private sector. If proper policies and laws are not put in place, citizens and industry will be unable or unwilling to collect geoinformation or share it with the government.

To begin addressing these issues, governments should consider a comprehensive review of the legal and policy issues that impact the collection, use, and distribution of geoinformation within their respective nations. Representatives from government, industry, universities and non-governmental organizations (NGOs) should be included in this process, since each is both a provider and consumer of geoinformation (often simultaneously). Such a review should include all potential sources, including laws, policies, regulations, directives, procedures, court cases, license agreements, international treaties and agreements and even national constitutions.

Upon completion of the review, the stakeholders can begin to develop the property institutional arrangements to address these issues within its legal and policy framework. The

best approach for each nation will depend upon a number of factors. For example, some nations will have a mature private sector and a vibrant NGO community, while in other nations geoinformation may still reside primarily within government agencies. It will also depend upon the type, complexity and maturity of the existing legal and regulatory system. These factors will have a direct impact on the type and speed with which institutional arrangements can develop.

It is important for nations to begin addressing these issues now as the issues will become even more complicated and difficult to resolve with the adoption of new technologies and more stakeholders. Moreover, given the growing appreciation of the power of geoinformation, if nations do not initiate such reviews themselves, other organizations are likely to do so.<sup>1</sup>

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<sup>1</sup> See e.g. “Viewpoint: We need ground rules for geo-information” (<http://www.bbc.co.uk/news/business-21624799>) (June 10, 2013)