

# Victorian Spatial Council

## Developing the Victorian Spatial Information Strategy 2008-2010

Information Paper – Background reading for Workshop series

The Victorian Spatial Council has been established under the Victorian Spatial Information Strategy 2004-07. The Victorian Spatial Information Strategy is a whole-of-Government strategy concerned with all aspects of Victoria's spatial information industry. It considers roles and requirements of the public and private sectors and academia in advancing Victoria's social, economic and environmental goals through the provision and application of spatial information.



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## CONTENTS

HOW TO READ THIS DOCUMENT .....	1
INTRODUCTION.....	2
WHERE WE ARE NOW .....	3
The Spatial Information Management Framework.....	3
<i>Spatial Data Infrastructure</i> .....	3
Summary of the Spatial Information Management Framework .....	5
ENVIRONMENT IN WHICH THE STRATEGY WILL BE DEVELOPED .....	6
Major issues.....	6
Government objectives .....	6
SIGNIFICANT EMERGING INFLUENCES– ISSUES, DEVELOPMENTS IN APPLYING SPATIAL INFORMATION, ETC.....	7
Introduction .....	7
<i>Themes</i> .....	7
DISCUSSION POINTS FOR MAJOR ISSUES/DEVELOPMENTS.....	8
Positioning - ‘Location Based Services’ .....	8
<i>Positioning Policy</i> .....	8
<i>Radio Frequency IDs</i> .....	9
<i>The Supranet</i> .....	10
<i>Policy and Legal issues</i> .....	12
<i>Address Management</i> .....	12
<i>National Address Management Framework</i> .....	12
Spatial Enablement .....	14
<i>Place based management</i> .....	18
eGovernment, eDemocracy .....	20
Re-use of Public Sector Information .....	22
<i>European Union directive on re-use of public sector information</i> .....	22
<i>Open content licensing</i> .....	23
<i>Creative Commons</i> .....	24
<i>GeoCommons</i> .....	26
<i>Digital Rights Management</i> .....	27
The nature of innovation.....	28
Web 2.0 and the Semantic Web.....	29
<i>Making Web 2.0 work</i> .....	30
<i>Online Notification and Edit (ONE)</i> .....	31
<i>The Semantic Web</i> .....	31
Growing technical power.....	33
<i>Information Management Environment</i> .....	33
Data content.....	35
Impact of new ‘business models’ .....	36
Institutions .....	39
<i>Roles and responsibilities</i> .....	39
<i>Cooperative Models</i> .....	39
VSC Forum.....	41
REFERENCES .....	42

## HOW TO READ THIS DOCUMENT

The following pages incorporate extracts from various readings to illustrate the kinds of issues and developments being discussed and to stimulate thoughts and discussion as part of developing Victoria's 2008-2010 Spatial Information Strategy.

New developments are occurring all the time, so this document can only provide a brief snapshot of developments that may shape the direction set out in the forthcoming Strategy.

The paper is a compilation of ideas and research by many individuals and published in a wide range of documents, including journals, blogs, websites and other papers in Victoria, nationally and internationally.

10 themes are considered – as listed on page 7.

The text in italics is taken directly from the source document and all references used are listed on the final pages. The numbers in square brackets (eg [1]) refer to the relevant document.

Links to web sites and reports are also provided in the body of the document so that readers can seek further information - just click on the footnotes at the bottom of the relevant pages, or highlighted URL in the text.

## INTRODUCTION

During 2007, the Victorian Spatial Council will lead the development of the Victorian Spatial Information Strategy 2008-2010.

The way in which spatial information is being delivered and presented is rapidly developing and is changing the way it is being perceived in the community.

The likes of Google Earth, Microsoft's Live Local product, and, closer to home, the Victorian Mapping and Address Service, are opening up the potential of spatial information to the non specialist user, who is now able to access it without the need for any specialised hardware, software or training.

Similarly, it seems that almost anyone can create 'spatial applications', such as the so-called 'mash-ups', which are using freely provided API software to draw maps and update them in real time.

Victoria's strategic framework is supporting the push toward greater availability of spatial information by stating explicitly that development of applications should enable data to be accessible by anyone anywhere; cater for all users; and enable data exchange, regardless of technology and formats.

But what does the pace of this change mean for the traditional spatial industry – the data producers, vendors, and GIS experts in government, the professions, business and academia? Is our existing spatial information management framework capable of supporting it? And what are the strategic and policy directions needed to meet these challenges, as well as the ongoing need to guarantee the quality of spatial information, improve the way in which it is managed and maintained, and to find national solutions to environmental, economic and social issues?

This paper aims to highlight some key themes around change/development in the spatial information environment to stimulate discussion for the development of Victoria's new strategy.

## WHERE WE ARE NOW

### The Spatial Information Management Framework

A decade and a half of strategic planning in Victoria, beginning in 1991, has seen the evolution of an information management framework based on a key set of principles to ensure spatial data is available, accessible and useable.

Today that framework has matured to the extent that it is now possible to define a set of core principles for spatial information management.

The necessity for such a framework is based on the premise that the successful application of spatial information in mainstream business activities should be supported by a sound underpinning management approach that guarantees that spatial information is available and able to be used.

The purpose of Victoria's Spatial Information Management Framework is to provide an enduring set of requirements for establishing and retaining a consistent approach to managing spatial information across the spatial information community. It proposes that there be a core set of requirements for managing spatial information representing a 'best practice' approach.

In its proposed form, the Framework provides a holistic approach to managing spatial information in Victoria, encompassing the:

1. institutional arrangements for developing spatial information;
2. requirements for creating and maintaining spatial information;
3. mechanisms for making spatial information accessible and available; and
4. strategic development of technology and applications.

It allows for the management of these elements in an integrated way to provide an environment for the effective use of spatial information.

### *Spatial Data Infrastructure*

The Framework is based on 11 core elements: governance, custodianship; framework and business information, data quality; metadata, awareness, access, pricing and licensing, privacy; and strategic development of technology and applications.

It is designed to take a holistic approach to developing all of the elements of a Spatial Data Infrastructure for Victoria (ie data, technology, policies, institutional arrangements and capacity building).

The key elements of this coordinated environment are shown below.

SDI elements	Framework components
Institutional arrangements for developing spatial information	Governance, Custodianship
Requirements for creating and maintaining spatial information	Framework and Business Information, Data Quality
Mechanisms for making spatial information accessible and available	Metadata, Awareness, Access, Pricing and Licensing, Privacy
Strategic development of technology and applications	Technology and applications

The focus for implementation of the Framework is the custodian of spatial information. It envisages a distributed network of custodians who will retain full

control of their respective datasets and commit to managing them according to the principles set out in the Framework and to making them available.

The principles of the Framework are summarised on the following page.

## Summary of the Spatial Information Management Framework

Information Management Components		Requirements
Institutional arrangements for delivering spatial information	Governance	<p>The VSC is responsible for policies and standards for spatial information across the spatial industry.</p> <p>The VSC develops and implements whole-of-industry spatial information policy and standards.</p>
	Custodianship	<p>Datasets managed by participants in the Framework will have designated custodians who will manage them according to the information management principles established by the Framework.</p> <p>Custodians will make their data available via the Victorian Spatial Data Directory (see Metadata).</p>
Creating and Maintaining Spatial Information	Framework Information	<p>Framework Information will be:</p> <ul style="list-style-type: none"> <li>▪ Maintained by custodians according to the Spatial Information Custodianship Guidelines and the Framework's information management principles, including data quality, metadata, awareness, access, pricing and licensing, and privacy.</li> <li>▪ Subject to periodic auditing to ensure that the component datasets continue to meet their published specifications.</li> </ul>
	Business Information	<p>Business Information will be:</p> <ul style="list-style-type: none"> <li>▪ Maintained by custodians according to the Spatial Information Custodianship Guidelines and the Framework's information management principles, including data quality, metadata, awareness, access, pricing and licensing, and privacy.</li> <li>▪ Subject to periodic auditing to ensure that the datasets continue to meet their published specifications.</li> </ul>
	Data Quality	<p>Custodians will develop data quality statements in consultation with users, and publish them in the product specifications and metadata for the respective datasets.</p>
Making Spatial Information Accessible and Useable	Metadata	<p>Each custodian will:</p> <ul style="list-style-type: none"> <li>▪ Ensure metadata is created as an integral part of datasets and associated products.</li> <li>▪ Collect, as a minimum, core 'Page 0' metadata elements, as defined by ANZLIC.</li> <li>▪ Include metadata with data distributed to users.</li> <li>▪ Publish metadata for their dataset(s) in the VSDD repository.</li> </ul>
	Awareness	<p>Custodians will publish metadata and product specifications, and make their spatial information available through the VSDD.</p>
	Access	<p>The VSDD will be the central access point for spatial information.</p> <p>Custodians of spatial information will publish metadata for their datasets in the VSDD.</p> <p>Multiple access and distribution mechanisms will be developed to make spatial information available to all types of users.</p> <p>A consistent approach to data licences and other agreements will be adopted.</p>
	Pricing and Licensing	<p>A whole of government pricing policy will be developed and adopted by all Departments.</p> <p>Pricing of spatial information developed and made available by Departments will be based on cost recovery, except where specifically exempted by the Department of Treasury and Finance or where a price is set down in statutes or regulations.</p> <p>Standard licence conditions will be adopted for all spatial information made available by Departments.</p>
	Privacy	<p>Custodians will recognise privacy requirements in the management of their spatial information.</p>
Strategic Development of Technology and Application		<p>Multiple access and distribution mechanisms will be developed for the delivery of spatial information.</p> <p>Distributed mapping resources based on OGC compliant web services will be the preferred approach to deliver spatial information, but where participants do not have the capability to implement this approach, multiple, redundant data stores will be developed.</p>

## ENVIRONMENT IN WHICH THE STRATEGY WILL BE DEVELOPED

### Major issues

Governments everywhere are dealing with major issues affecting the environment, society and economy. The most notable include

- Climate Change
- Water
- Emergency Management
- National Security

As well as the traditional objectives of providing health, education and social welfare.

All these issues require policy responses, which in turn relies on reliable and comprehensive information to support sound decision making.

### Government objectives

The Victorian Government's objectives are set out in *Growing Victoria Together* – its 'vision for Victoria to 2010 and beyond'.

The Victorian Government's **vision** is that by 2010 Victoria will be a state with:

- A thriving economy
- Quality health and education
- A healthy environment
- Caring communities
- A vibrant democracy

The Government has identified ten shared **goals** that will be a focus for setting Government priorities.

- More quality jobs and thriving innovative industries across Victoria
- Growing and linking all of Victoria
- High quality accessible health and community services
- High quality education and training for lifelong learning
- Protecting the environment for future generations
- Efficient use of natural resources
- Building friendly confident and safe communities
- A fairer society that reduces disadvantage and respects diversity
- Greater public participation and more accountable government
- Sound financial management

What role can spatial information play in addressing these objectives and issues?
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## **SIGNIFICANT EMERGING INFLUENCES– ISSUES, DEVELOPMENTS IN APPLYING SPATIAL INFORMATION, ETC**

### **Introduction**

The way we think about spatial information and its uses is changing. The topics covered in this information paper show how things are developing and where the challenges and opportunities lie.

There are initiatives occurring in non-spatial areas that will have an impact on spatial – our ability to deliver it; the widening uses to which it can be put; the legal and security challenges that may impact on the application of spatial information.

### *Themes*

10 areas of change/development are considered to stimulate discussion for the development of Victoria’s strategic direction for the period 2008 to 2010.

The themes that are considered in the following pages are as follows:

1. Positioning – including Location Based Services
2. Spatial Enablement – including Place based management
3. Re-use of public sector information – including pricing, digital rights management
4. The nature of innovation
5. The Semantic Web and Web 2.0 – an emerging ‘community of users’
6. Growing technical power – including grid computing
7. The content – quality, availability, being able to find it, applications being data driven
8. eGovernment and eDemocracy
9. Impact of new business models on ‘traditional’ government providers
10. Institutions

Are these issues relevant?

Should other issues be considered? Which ones?

What might be the strategic and policy implications of these themes?

## DISCUSSION POINTS FOR MAJOR ISSUES/DEVELOPMENTS

### Positioning - ‘Location Based Services’

Location based services are built on the convergence of network computing and wireless telecommunications with positioning technologies. [18]

LBS can be defined in many ways, such as

*Location Services deliver information about the geographic location of mobile telecommunications devices. This includes mobile telephones, mobile interactive browsers and devices attached to other moveable items such as people, packages and vehicles. Location Based Services deliver end-user applications based on Location Services.*

### Positioning Policy

Determining position using mobile devices is now a simple process, and is increasingly being used in government and the wider community. The positions determined are used in a wide range of applications including policing, vehicle fleet management, farming, and the collection of spatial information.

Positioning is provided by Global Navigation Satellite Systems (GNSS), such as the American GNSS, GLONASS, Galileo, QZSS and Compass. The availability of multiple GNSS constellations will accelerate take-up and improve performance.

There are also other positioning technologies emerging, including mobile phone positioning, and Ultra Wide band positioning.

The positioning technology is either mature, or maturing. What is currently lacking, however, is a policy framework to allow its best use. Such a framework must provide for a range of positioning technologies and also allow integration of complementary technologies, as environmental conditions mean that the solution preferred in any given context at any given time may vary. Receiver/handset functionality will also vary widely.

There will also be a range of user requirements and expectations — surveying, construction, engineering and precision agriculture require high precision, while recreational activities such as bushwalking may be far less demanding. There will be a range of intermediate requirements — asset capture, logistics, navigation, insurance, security. Addressing these permutations and combinations of platforms, technologies, receiver functionality, requirements and expectations will require an overall state wide framework policy and individual more detailed sector based elements.

There is also a need for certainty. Ultimately this includes legal traceability of both the measurements of position and the spatial datasets derived from them or used in conjunction with them.

Implementation of an effective policy will allow individual sectors to have confidence that: their measurements are fit for purpose, their spatial data are reliable, and use of positioning information in legal and commercial environments can be supported.

## Radio Frequency IDs

### Definition of RFID:

*'RFID is a form of automatic identification and data capture (AIDC) technology that uses electric or magnetic fields at radio frequencies to transmit information. An RFID system can be used to identify many types of objects, such as manufactured goods, animals, and people. Each object that needs to be identified has a small object known as an RFID tag affixed to it or embedded within it. The tag has a unique identifier and may optionally hold additional information about the object. Devices known as RFID readers wirelessly communicate with the tags to identify the item connected to each tag and possibly read or update additional information stored on the tag. This communication can occur without optical line of sight and over greater distances than other AIDC technologies. RFID technologies support a wide range of applications—everything from asset management and tracking to access control and automated payment.'*

Source: [Guidelines for Securing Radio Frequency Identification \(RFID\) Systems](#)<sup>1</sup>, published by the National Institute of Standards and Technology, April 2007 [17]

### 'Internet of Things'

The European Commission has been engaged in a major policy development and consultation exercise since 2006 on the use of RFID. In its March 2007 Fact sheet 54 [5] it says:

*'Looking into the future, RFID and smart tags will allow the creation of an "Internet of Things", where objects and locations may be directly related to one another. These objects will also be capable of increasingly "intelligent" interaction.'*

*From RFID to the Internet of Things: Pervasive Networked Systems*, Report of the Conference organised by DG Information Society and Media, Networks and Communication Technologies Directorate, March 2006 [6] describes the 'Internet of Things as

*'... a network of billions or trillions of machines communicating with one another. It is a major or dominant theme for the evolution of information and communications over the next few decades, and in its simplest form it is already here. There were 1.3 billion radio-frequency identification tags (RFIDs) and two billion mobile service users, worldwide, in 2005. The idea has grown from advanced concepts from the last twenty years:*

- *ubiquitous communications*
- *pervasive computing*
- *ambient intelligence'*

The European Commission has been considering RFIDs (Press Release, October 2006 [8]) because it:

*'... considers RFID as an emerging technology that has great potential for many economic operators in Europe as well as for Europe's citizens. Few new technologies have triggered so much attention from businesses, consumer*

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1. [http://csrc.nist.gov/publications/nistpubs/800-98/SP800-98\\_RFID-2007.pdf](http://csrc.nist.gov/publications/nistpubs/800-98/SP800-98_RFID-2007.pdf)

*organisations, data protection experts and politicians around the world as RFID Devices. The place taken by RFID in the public debate today largely derives from the fact that this technology is currently moving rapidly from the research lab to mass applications in a similar way to GSM mobile phones in the 1990s.'*

*'The RFID market is expected to grow rapidly over the next ten years. Cumulative sales worldwide of RFID tags for 60 years since their invention until the beginning of 2006 amount to 2.4 billion, with 600 million tags being sold in 2005 alone! The number of tags delivered in 2016 could be over 450 times the number delivered in 2006. If the main technical and economic challenges are resolved in the near future (e.g., yield vs. cost, frequency acceptance, required performance levels), the global RFID market might grow exponentially to be almost ten times the size in 2016 that it will be this year – the value of the total market, including systems and services, could reach 20.8 billion euro in 2016 from 2.2 billion euro in 2006.'*

The European Commission has recently published a communications paper (March 2007) on steps towards a policy framework on RFIDs [7] - [Radio Frequency Identification \(RFID\) in Europe: steps towards a policy framework](#)<sup>2</sup>

It believes RFID matters because it has the potential to provide many benefits:

*'... safety (e.g., food traceability, healthcare, anti-counterfeiting of drugs); convenience (e.g., shorter queues in supermarkets, more accurate and reliable handling of luggage at airports, automated payment); and accessibility (e.g., patients suffering from dementia and Alzheimer's disease). It is already used in different sectors with an impact on the lives of Europeans. In transport, RFID is expected to contribute to improved efficiency and security, and provide new quality services for mobility of people and goods. In healthcare, RFID has the potential to increase the quality of care and patient safety, and to improve medication compliance and logistics. In retail, RFID could help to reduce supply shortages, inventory levels, and theft. In many industries, including pharmaceuticals, medical devices, entertainment, consumer electronics, luxury goods, car parts, or retail, where counterfeiting is a significant source of products of unacceptable quality, the use of RFID may allow products to be recalled more efficiently and to prevent illicit goods from entering the supply chain or spot where these actually entered it. RFID tagging is expected to improve sorting and recycling of product parts and materials. This may result in a better protection of the environment and an improvement in sustainable development.'*

## *The Supranet*

A further development in this category is the 'Supranet'.

As discussed in the CRC-SI paper: 'Know, Think, Communicate – the key elements of Virtual Australia' [15] the idea of the Supranet is the creation of a parallel, or 'virtual', or 'mirror' world – every non-trivial object in this physical world having a virtual (digital) representation in the virtual (digital) world.

It provides the capacity to manage by location:

- Identity – who/what the object is
- Location – where it is

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2. [http://ec.europa.eu/information\\_society/policy/rfid/index\\_en.htm](http://ec.europa.eu/information_society/policy/rfid/index_en.htm)

- Time – when it is

Sensors or other intelligent devices (such as ‘smart dust’ or ‘motes’) embedded in the objects will facilitate collecting spatially related information about a location – ie what is happening there.

The billions of sensors form the ‘supranet’.

The Supranet is already becoming visible, as the New York Times reported in July 2005 in the article [‘Marrying Maps to Data for a New Web Service’](#) [19]:

*‘In 1991, David Gelernter, a computer scientist at Yale, proposed using software to create a computer simulation of the physical world, making it possible to map everything from traffic flow and building layouts to sales and currency data on a computer screen.*

*Mr. Gelernter’s idea came a step closer to reality in the last few weeks when both Google and Yahoo published documentation making it significantly easier for programmers to link virtually any kind of Internet data to Web-based maps and, in Google’s case, satellite imagery.’*

*‘Viewed broadly, the new services represent a shift to what is being described as “Web 2.0,” a new generation of Internet software technologies that will seamlessly plug together, much like Lego blocks, in new and unexpected ways.*

*“These are small pieces loosely joined,” said Tim O’Reilly, chief executive of O’Reilly Media, a publishing and conference company based in Sebastopol, Calif. “People are creating new functionality by combining these different services.’*

(For more on Web 2.0 as discussed in this paper, click on the following: [Web 2.0 and the Semantic Web.](#))

#### ‘CitySense’

Another example of the use of sensors is the ‘CitySense’ experimental network in Cambridge Massachusetts. This was reported in the article [‘A Wireless Sensor City’](#)<sup>3</sup> [4].

CitySense will provide ‘an open test bed on which anyone can run experiments’ using WiFi technology.

*For example, ‘A first batch of sensors will collect weather data such as rainfall, wind speed, and barometric pressure. Another set of sensors will measure pollution such as the amount of particles in the air. Researchers could use the weather data to understand how temperature or wind speed vary throughout the city, and doctors could use the pollution data to advise patients with asthma to stay away from certain areas at certain times of day. Eventually, more sensors could be incorporated: for example, motion sensors could measure traffic flow, and light sensors scattered throughout the city could monitor parking spaces; the data would be uploaded to the CitySense network. “With something like CitySense,” [Matt] Welsh [professor of computer science at Harvard] says, “we’re going to be able to blanket the city with sensors and get a much more complete sense of what’s going on.”’*

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3. <http://www.technologyreview.com/Infotech/18533/>

## *Policy and Legal issues*

While the technical feasibility of these location based networks has been demonstrated, there are wide ranging policy and legal concerns.

On the RFID, the European Commission states [7]:

*‘RFID is technologically and commercially ready, but several factors are holding back its takeup. Not least, a clear and predictable legal and policy framework is needed to make this new technology acceptable to users. This framework should address: ethical implications, the need to protect privacy and security; governance of the RFID identity databases; availability of radio spectrum; the establishment of harmonised international standards; and concerns over the health and environmental implications.’*

## *Address Management*

The previous examples illustrate forms of identifier management. Address Management is another, and a national initiative is underway to establish a framework for address management.

Address is the starting point because there are still a range of issues associated with privacy and confidentiality when considering identifiers (such as ABS collector districts, suburb, electorate, and parcel – as well as address).

Digital systems rely heavily on unambiguous identifiers, eg email must have a well structured system of unique addresses administered by a single central authority, because digital systems can't easily resolve ambiguity.

Contrast that with postal addresses – ambiguity is often resolved by local knowledge and experience – held by the postman.

The identifiers themselves and the relationships between them must be standardised and documented to effectively support on-line transactions.

Address is increasingly being used to better understand community demand for government services and the services it delivers (and how well it delivers them).

## *National Address Management Framework*

The National Address Management Framework initiative aims to establish a nationally consistent, standard approach to name and address management; and complete interoperability of name and address, both across jurisdictions and between levels of government.

It will incorporate:

- a single authoritative address data set (the Geo-coded National Address File);
- compliance with data semantics rules (AS4590) and a national standard XML schema for data interchange;
- a national standard (or compliance framework) for address parsing and validation;
- a common service (or compliance with that service standard) enabling rapid, reliable access to the common reference data set;
- a common service interface so that jurisdictions may directly validate addresses in their area on behalf of other requesting jurisdictions; and
- a common service (or compliance with that service standard) enabling rapid and reliable geo-coding and routing.

What might the strategic and policy implications of the themes described in the preceding pages be?

How will Victoria deal with the policy and legal implications of the development of location based technologies such as those described above?

## Spatial Enablement

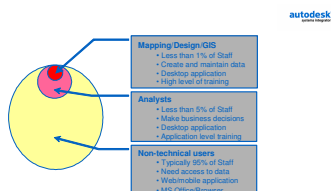
The focus of this idea is the expansion of the availability of spatial information beyond those who would normally be considered users (who are usually specialists).

Initiatives such as the Spatial Smart Tags/Victorian Mapping and Address Service (VMAS) attempt to provide access to spatial information to users via standard software.

VMAS grew out of the recognition that spatial information should be a fundamental tool for Government, but isn't, largely because it had been

- difficult to obtain (poor access and distribution)
- difficult to understand and apply (knowledge/expertise)
- expensive to process and apply (hardware, software, specialist staff)

This diagram has been used on many occasions to illustrate the way the use of spatial information is distributed. The three categories of user are: expert, analyst and non-technical.



Fewer than 1% of users can be classed as mapping/design/GIS 'experts'. Typically these users create and maintain data, have had a high level of training and use specialist GIS software as part of their day to day activities.

Analysts make up fewer than 5% of users. These users make business decisions, have usually had application level training and use specialist GIS software as part of their day to day activities.

The remaining 95% are typically non-technical users, who would access the data through the web or other mobile applications using browsers or standard desktop software (such as Microsoft Office).

### Examples of spatial enablement

#### New York Mayor's Management Report

The New York Mayor's Management Report (MMR) is extending the use of location information to understand the performance of the city's service delivery agencies. [9]

The web site described the purpose of MMR:

*It 'serves as a public report card about the way City services affect residents' lives. My Neighborhood Statistics lets City residents know how City services are performing in their neighborhood by viewing locally mapped performance statistics through the City's website. Citizens can make comparisons between the highs and lows in different neighborhoods, as well as cross-year and citywide comparisons. Data generated from the City's 311 Citizen Service Center is being used to validate agency performance, is included in the MMR, and is included on My Neighborhood Statistics for select services requested through 311. Additionally, the revamped Office of Operations' website includes direct links to the MMR and My Neighborhood Statistics, lists various monthly 311 Citizen Service Center call data, and is more interactive, providing the public with greater access to current and historical performance information.'*

Extracts from the MMR and My neighbourhood statistics

*The Mayor's Management Report (MMR.) ... serves as a public report card on City services affecting the lives of New Yorkers. The MMR is released twice a year.*

Extract from February 2007 preliminary MMR:



**Key Public Service Areas**  
 ✓ Perform forensic investigations.  
 ✓ Recover and identify remains of decedents following a mass fatality incident.

**Critical Objectives**

- Provide prompt issuance of death certificates, completion of autopsy reports, and response to requests for cremation.
- Provide timely and accurate forensic laboratory services.

**Preliminary Performance Highlights**

- The reporting period saw improved timeliness measures for OCME services that most directly affect members of the public. The proportion of death certificates issued within four hours rose, although remaining below target. The rate of autopsy reports ready within 90 days climbed to 86 percent, the highest level yet reported for this measure; and responses to cremation requests within 12 hours rose to 93 percent.
- Most measures of timeliness declined for OCME's toxicology lab, including the average time to complete a forensic toxicology case, although performance began to turn around by the end of the July-October reporting period. The Office is working to resolve procurement delays which affected performance during the summer.
- Construction difficulties have delayed the completion of OCME's \$285 million DNA laboratory, postponing planned opening of the facility from November 2006 to February 2007. Measures reflecting timeliness of DNA testing are expected to improve after operations commence at the new facility.
- OCME has recovered more than 20,000 human remains from the World Trade Center disaster since Fiscal 2002 and has identified nearly 11,000 of these remains. The Office has developed a comprehensive strategy to search the WTC site for all remains and continues to investigate.

**Scope of Agency Operations**

The Office of Chief Medical Examiner (OCME) is responsible for investigating deaths resulting from criminal violence; casualty or suicide; that occur suddenly, when in apparent good health; when unattended by a physician; in custody; or occurring in any suspicious or unusual manner. The Office also investigates deaths where an application for cremation is made. The Office provides additional forensic services, including DNA testing, to support criminal investigations. OCME is responsible for fatality management following a disaster and continues to work in the aftermath of the World Trade Center disaster to recover and identify the remains of the 2,749 persons reported missing. The Office also manages all functions of the City mortuary, including the retrieval and processing of deceased bodies, performance of autopsies, and body preparation for City burial.

**Performance Report**

- ✓ Perform forensic investigations.

Performance Statistics	Actual			September 2006 MMR Updated			4-Month Actual	
	FY04	FY05	FY06	FY07 <sup>1</sup>	FY07 <sup>1</sup>	FY08 <sup>1</sup>	FY06	FY07
Death certificates issued within four hours of autopsy completion (%)	89%	88%	NA	95%	95%	95%	62%	68%
Autopsy reports completed within 90 days (%)	72%	72%	78%	75%	75%	75%	70%	86%
Average cost of an autopsy (\$)	\$4,147	\$4,637	NA	*	*	*	Annual Only	
Cremation requests responded to within 12 hours (%)	93%	92%	92%	95%	95%	95%	92%	93%
Average time to complete a forensic toxicology case (days)	18	20	30	30	31	31	21	39
Fatality cases completed within 30 days using forensic toxicology (%)	82%	75%	62%	75%	75%	75%	65%	34%
DWI & sexual assault cases (non-fatality) completed within 30 days using forensic toxicology (%)	84%	90%	88%	90%	90%	90%	84%	85%

<sup>1</sup> Numerals: Target 311 related **Bold** - indicates revisions from the September 2006 MMR "NA" - means Not Available in this report

To read this page, and the full report click on: [Mayor's Management Report](#)<sup>4</sup>

4. [http://www.nyc.gov/html/ops/downloads/pdf/2007\\_mmr/0207\\_mmr.pdf](http://www.nyc.gov/html/ops/downloads/pdf/2007_mmr/0207_mmr.pdf)



*The 311 Citizen Service Center provides non-emergency government information and services. In order to improve the transparency of services being provided to the public, the Office of Operations and the Department of Information Technology and Telecommunications will regularly report 311-generated information to the public through this website.*

## **311 is New York City's New Phone Number for Government Information and Services**

**Whether you're a resident, business owner, or a visitor, all the resources of New York City are just a phone call away...**

Among the many services accessible through 311, you can:

- Find out if alternate side of the street parking is in effect;
- Get information on services for the aging;
- Report a loud noise or blocked driveway;
- Learn about volunteer activities in your neighborhood;
- Learn about programs designed for small businesses;
- Give the Mayor your opinion;
- Report a pothole or street light that needs to be fixed;
- Obtain your local garbage pickup schedule;
- And, much, much more.

All calls to 311 are answered by a live operator, 24 hours a day, seven days a week, and services are provided in over 170 languages. Dial 311 from within the City or (212) NEW YORK outside of the five boroughs. TTY service is also available by dialing (212) 504-4115.

311 provides New Yorkers with one easy-to-remember number to access non-emergency City government services.

**Remember, for emergencies dial 911.**

311 as described on their website [10]

*311 is New York City's phone number for government information and non-emergency services. Whether you're a resident, business owner, or a visitor, all the resources of New York City are just a phone call away...*

*311's mission is to:*

- *Provide the public with quick, easy access to all New York City government services and information while maintaining the highest possible level of customer service.*
- *Help agencies improve service delivery by allowing them to focus on their core missions and manage their workload efficiently.*
- *Provide insight into ways to improve City government through accurate, consistent measurement and analysis of service delivery Citywide.*

*Features of 311*

- *311 allows customers to call one easy-to-remember number in order to receive*

information and access to City government services.

- All calls to 311 are answered by a live operator, 24 hours a day, seven days a week.
- Immediate access to translation services in over 170 languages is available.
- 311 Call Center Representatives use a state-of-the-art database of information and services about City government. Information can be updated in real time, and 311 works closely with other City agencies to maintain the most current information.
- The 311 call center can quickly scale to meet City demands in an emergency situation.

Readers can view maps of the statistics compiled in the MMR and 311 on the ‘My Neighborhood Statistics web pages:



My Neighborhood Statistics lets New York City residents know how City agencies are performing in their neighborhood by viewing locally mapped performance statistics using a street address or intersection. Color-shaded maps also allow for easy comparisons of highs and lows in different neighborhoods.

The screenshot shows the 'My Neighborhood Statistics' web application. At the top, there is a navigation bar with links for Mayor's Office, City Agencies, Services, News & Features, City Life, and Contact Us. Below this is a search bar and a 'My Neighborhood Statistics' logo. The main content area features a map of Manhattan with a red star indicating the current location at '1 BROADWAY, MANHATTAN'. To the right of the map are several tool options: 'Click on a Tool Below', 'Zoom In', 'Zoom Out', 'Refresh Statistics', 'Redraw map based on:' (with options for Community Boards, Police Precincts, and School Regions), and 'Other Tools' (including New Location Search, Printer-Friendly Report, User Guide, and See Your Community Health Profile). Below the map is a horizontal menu with tabs for '311 Statistics', 'Health, Education and Human Services', 'Infrastructure, Administrative and Community Services', 'Public Safety and Legal Affairs', and 'Business and Cultural Affairs'. The '311 Statistics' tab is active, displaying a table of statistics for Manhattan Community Board #1. The table includes columns for 'Map', '% of City Total', and 'Fiscal YTD' for months from MAR\_07 to JUL\_06. The data rows include categories like 'Complaints Against Establishments Violating a Smoking Law', 'Complaints Regarding Blocked Driveways', 'Complaints Regarding Derelict Vehicles', 'Complaints Regarding Disorderly Youths', 'Complaints Regarding Illegal Parking', 'Complaints Regarding Noise', and 'Rodent Complaints'. A 'VIEW 311 HISTORICAL DATA' link is provided at the bottom of the table. A note at the bottom of the page states: 'Notes: - Neighborhood-level statistics may not add to citywide totals because addresses could not be determined for every case.'

Map	% of City Total	Fiscal YTD	MAR_07	FEB_07	JAN_07	DEC_06	NOV_06	OCT_06	SEP_06	AUG_06	JUL_06
Complaints Against Establishments Violating a Smoking Law	3.34%	165	6	15	18	10	8	9	6	23.82	11
Complaints Regarding Blocked Driveways (per 10,000 residents)	0.15%	18.3	1.16	2.61	1.74	3.2	2.03	2.91	1.74	0.87	2.03
Complaints Regarding Derelict Vehicles (per 10,000 residents)	0.21%	8.43	1.16	0.58	0.87	0.58	1.16	1.16	0.87	1.16	0.87
Complaints Regarding Disorderly Youths (per 10,000 residents)	0.32%	2.61	0.58	0	0.58	0	0.29	0.29	0.29	0.58	0
Complaints Regarding Illegal Parking (per 10,000 residents)	1.95%	149.33	18.88	13.36	14.53	19.76	21.5	21.5	21.79	3.2	14.82
Complaints Regarding Noise (per 10,000 residents)	0.52%	254.21	23.53	16.56	34.86	38.06	22.37	38.64	36.9	18.88	24.4
Rodent Complaints (per 10,000 residents)	0.92%	43.58	5.81	3.49	6.68	3.2	3.2	6.1	2.91	4.36	7.84

To view this page click on: [Neighbourhood report](#)<sup>5</sup>

Citywide indicator maps are provided in pdf form by clicking on the subject item in the list on the right hand side of the screen.

5. <http://gis.nyc.gov/ops/mmr/findlocation.jsp?street=1+Broadway&borough=Manhattan&geocodemode=1&rf=0.4711116453010572>

### 311 in Victoria

The Premier, Steve Bracks, has flagged an investigation into establishing a 311 service in Victoria as reported on the NineMSN website on 16 May 2007:

*‘Premier Steve Bracks has flagged the introduction of a 24-hour government phone service in Victoria after touring New York’s “311” call centre.*

*“This is a one-stop-shop phone line for residents of New York to call for all non-emergency government services or questions about city services, anytime of the day or night,” Mr Bracks said on Tuesday in the US.*

*“A number of other cities across the US and Europe are also implementing similar telephone lines and I believe this is something that warrants further investigation in Victoria.”*

*Mr Bracks said the 311 service had reduced the number of unnecessary calls made to New York’s 911 emergency line.*

*Victoria has a range of community phone services which could also be consolidated under one number, he said.’*

### Place based management

The idea of ‘Place based management’ is becoming more prominent. In Victoria it is taking a holistic approach to planning, developing and delivering services based on geographic regions.

Spatial data can be used to support planners in making better informed decisions around service planning, development, and delivery by providing a clear picture of where things are happening. The question becomes – what is the need/outcome being addressed and what resources are needed to help deliver that outcome.

Spatial information is a key resource in describing the characteristics of a ‘place’.

Good information about what a region looks like and expectations of what is going to happen enable

- a stronger emphasis on service planning and delivery at the local level
- targeting services to areas of need
- better matching of service to need
- services designed around the specific needs of the community

### Place, planning and public value

The importance of ‘place’ is described by the Demos Think Tank in its recent paper [‘Future Planners: Propositions for the next age of planning’](#)<sup>6</sup> [20]

While this paper is based on the British context, and focuses on the role of the planner, there are resonances for planning and place in Victoria.

*‘Not since the era of post-war redevelopment has the future of the built and natural*

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6. [http://www.demos.co.uk/files/Future\\_planners\\_final\\_web.pdf](http://www.demos.co.uk/files/Future_planners_final_web.pdf)

*environment generated such interest, or been so contested. Places, and changes to them, have taken on new political, economic and social significance for the private, public and third sector alike.*

*‘The centrality of place across these three sectors is clear. Real-estate is an increasingly essential direct and indirect economic engine; around 10% of GDP is now generated by the development sector itself. The report by economist Sir Nicholas Stern sees planning as central to combating climate change. Spatial planning as an emerging discipline taps the planning profession into the country’s most compelling social and political challenges. And our understanding of the cultural value of place, as a generator of social capital and neighbourliness has risen from academic nicety to policy imperative.’*

*‘The “public value” of a place emerges from a diverse range of interactions, from the choices individuals make in the high street, their informal relationships with neighbours and the people they live near, through to the investment and development decisions of businesses and developers. Change to the built and natural environment is not determined solely by the state – it is a product of these interactions. But that hasn’t negated the need for an expression of collective or public interest. It is the changes to the economy and society more broadly that has led to crucial shifts in how collective interest in a place can be expressed, legitimated and delivered.’*

#### **What is ‘Public Value’?**

*‘Public value in the built and natural environment is more than the aggregate of private and state interests. It describes collective interests that are determined by people’s attitudes to and decisions regarding a place. The way we understand public value starts with the idea that public services cannot take the underlying purpose of their institution, its legitimacy, or the value it creates for citizens to be self-evident, simply because they are public institutions whose mandate has been supplied by democratically elected governments.*

*‘We take “public value” to be the achievement of democratically legitimate sustainable development. In working towards it, public bodies need to increasingly, and constantly, engage across sectors and move out of their “silo”. The definition we are taking, in integrating environmental sustainability and social justice with economic growth, builds on the definition of sustainable development in the UK Sustainable Development Strategy (March 2005). This requires all to take a long term view. It demands a reassertion of the idea, long enshrined in Government policy that the planning system aims to pursue the public interest.’*

What contribution can the spatial information strategy make to this way of thinking about service delivery and performance?

What might the strategic and policy implications of the themes described in the preceding pages be?

How do we make spatial information an integral part of planning for place based management/development?

## **eGovernment, eDemocracy**

Egovernment, eDemocracy, are about ‘building better relationships between citizens and government’.

Two recent announcements from Gary Nairn, the Special Minister of State (Australian Government), illustrate the objectives of this form of interaction.

On the AGIMO web site, an initiative to support eDemocracy is reported as follows. [24]

*At the Australian Computer Science conference in March 2007, he announced a move towards the use of online eDemocracy techniques for the Australian Government.*

*The intention is to use Web 2.0 style of interactions between citizens and stakeholder organisations in the consultation phase of policy formation. The plan is to publish the comments from those that provide feedback on proposals and publications with their agreement in a discussion forum space from the main Australian government portal - [www.australia.gov.au](http://www.australia.gov.au).*

*To support such initiatives the Minister launched the Principles for ICT-Enabled citizen engagement at the conference.*

*Mr Nairn noted that in March 2006 the government made a commitment in its 2006 e-Government Strategy, Responsive Government: A New Service Agenda to “establish principles for online engagement” to support a consistent experience for everyone engaging with the government electronically.*

*The launch of these Principles supports this deliverable, and is a good practical example of the consultation advocated in the e-Government Strategy.*

*“By examining existing national and international approaches to citizen engagement using ICT, we have ensured our Principles will operate as a best practice guide,” Mr Nairn said.*

*The eight Principles are:*

- *commitment;*
- *community focus;*
- *community capability and inclusiveness;*
- *mutual respect, confidence and trust;*
- *interactivity and flexibility;*
- *responsibility and accountability;*
- *security and privacy; and*
- *evaluation and efficiency.*

*When applied to government and citizen consultative processes using ICT, the Principles will guide, facilitate and encourage a consistent approach for agency and citizen engagement using ICT.*

In another initiative, as reported in ZDNet on 2 May 2007 [16], the Minister gave an update to the CeBIT conference on progress with the 2006 eGovernment Strategy, *Responsive Government: A New Service Agenda*:

*“More and more people are accessing [government] information and services exclusively online,” he said.*

*“We now have one in five people only dealing with government online. That’s increased quite a bit in the last 12 months or so. We think it’ll go to one in three probably within a couple of years.”*

*The government has designated the australia.gov.au portal as the main entry point to online services.*

*The site currently attracted about 500,000 hits per month, said Nairn.*

*Key to the success of this site was the search capability developed by CSIRO spin-off Funnelback, he said. The improved search has helped citizens locate government services more easily. The search tool has been adopted by the Web sites of 20 other government agencies.*

*Nairn also reiterated the government’s plans to introduce user accounts to access online government services.*

*“Through australia.gov.au we want to eventually provide citizens with individual user accounts and simple access to government services available online through a single sign-on process,” he said.*

*“We also want to allow for the pre-population of forms so users don’t have to re-enter the same information. We want to cut out more red tape to let people comply with government requirements more easily.”*

What contribution can spatial information make to eGovernment, eDemocracy?

What might the strategic and policy implications of this theme be?

## Re-use of Public Sector Information

### *European Union directive on re-use of public sector information*

Re-use of Public Sector Information is considered in context of the commercial benefit that the availability of such information can provide, or to the public benefit eg through open licensing.

Re-use of public sector information (including spatial information) provides the following opportunities:

- ability to release more data for wider use
- greater opportunities for innovators to take it up and develop applications
- increasing an economy's GDP by facilitating its commercial exploitation

With the advent of the web, there have been moves to loosen the restrictions inherent in the copyright regime of 'all rights reserved'.

There has been much effort in answering the question of how best to free up public sector information for commercial exploitation.

The European Commission has examined the re-use of public sector information in its member countries in the brochure, [Exploiting the Potential of Europe's Public Sector Information](#)<sup>7</sup> (May 2004). [12]

Public sector information has a considerable economic value – in 2000 it was estimated that in Europe this amounted to €68 billion, of which 38% came from 'geographical' information.

The brochure argued that *'much of the information produced by the public sector has the potential for re-use in the market place. It can be the basis for new, added-value services created by private companies.'*

The following barriers to re-use were singled out:

- No culture of re-use – its possibility not being taken into account by public sector organisations
- Lack of information on public sector information available and conditions of re-use – it is hard to find out what information is available
- Competition issues – public sector bodies generally have a natural monopoly over the production of information – and put limits on access to it
- Different traditions and rules among member countries
- Language
- Lack of common standards and metadata – absence of common principles storing and describing information

In response, a [Directive on the re-use of public sector information was issued by the European Union](#)<sup>8</sup> (November 2003) [13]. Its principles include the following:

- Public sector bodies shall make their documents available through electronic means where possible and appropriate.

7. [http://ec.europa.eu/information\\_society/policy/psi/docs/pdfs/brochure/psi\\_brochure\\_en.pdf](http://ec.europa.eu/information_society/policy/psi/docs/pdfs/brochure/psi_brochure_en.pdf)

8 [http://ec.europa.eu/information\\_society/policy/psi/docs/pdfs/directive/psi\\_directive\\_en.pdf](http://ec.europa.eu/information_society/policy/psi/docs/pdfs/directive/psi_directive_en.pdf)

- Where charges are made, the total income from supplying and allowing re-use of documents shall not exceed the cost of collection, production, reproduction and dissemination, together with a reasonable return on investment.
- Any applicable conditions and standard charges for the re-use of documents held by public sector bodies shall be pre-established and published.
- Public sector bodies may allow for re-use of documents without conditions or may impose conditions, where appropriate through a licence. These conditions shall not unnecessarily restrict possibilities for re-use and shall not be used to restrict competition. Member States shall ensure that practical arrangements are in place that facilitate the search for documents available for reuse.
- The re-use of documents shall be open to all potential actors in the market.
- Contracts or other arrangements between the public sector bodies holding the documents and third parties shall not grant exclusive rights.
- However, where an exclusive right is necessary for the provision of a service in the public interest, the validity of the reason for granting such an exclusive right shall be subject to regular review.

### *Open content licensing*

Other mechanisms to facilitate re-use are being encouraged, such as free/open content licensing, particularly Creative Commons.

The quotes cited below (in italics) come from the *'Guide to Open Content Licences'* by Lawrence Liang, June 2005 [14]

Copyright has traditionally been an exclusive right that is granted to the owner of copyright to exploit her/his work.

Copyright is a default position – everything is presumed to be protected unless otherwise stated – whatever the intention of its creator might have been.

The philosophy behind free software (in the sense of 'freedom' not pricing) and open content licensing:

*'The free software model is predicated on the idea of a user-as-producer, a user who has the ability to contribute to the existing work and simultaneously become a producer as well.'*

*'[The model] argues that the very essence of cultural production has been about learning from copying and producing by creatively using works that exist in the public domain. It also moves away from the mythical notion of the originality of the work to recognize the value that various users contribute through their modifications and adaptations to an existing work, thus placing a higher premium on collaborative production than on isolated production.'*

*'The "public domain" could be understood as the body of works that we have access to, to create newer works.'*

*'This public domain has also often been referred to through the metaphor of the "Commons", resources that are not divided into individual bits of property but rather are jointly held so that anyone may use them without special permission.'*

What is the implication of considering spatial datasets, particularly those produced by government agencies, as being in the ‘public domain’?

*‘Free/open content is not inconsistent with the ability for [the author] to charge for it. The licensing model allows enough flexibility for [the author] to determine the manner in which [s/he] will license the use of [her/his] work. For instance while [s/he] may allow for academic uses and other not-for-profit use (or even charge for them), [s/he] could reserve the right for any commercial usage.’*

#### What kind of licence?

Open content licences are based on the author of the work having a valid copyright – this and the exclusive rights it grants means that the author can structure the licence in a way that gives her/him the ability to impose the kinds of rights and obligations involved in using the work. They cannot be used to violate copyright.

This helps ensure that derivative works that impose restrictive conditions cannot be created.

*‘The premise of an open content licence is that ... [it enables] users to have certain freedoms by granting them rights. Some of these rights are usually common to all open content licences such as the right to copy the work and the right to distribute the work. ... When choosing a licence, the first thing that [the author] will have to decide is the extent to which [s/he is] willing to grant someone rights over [her/his] work.’*

Open content licences do not necessarily stop authors from making a living from their work: *‘... even after releasing a piece of work on a non-commercial basis, authors may sell the copyright to a for-profit entity provided that there is no exclusion placed upon continuing non-commercial usage.’*

*‘There should be appropriate credits given to the author of the work. This procedure applies in two scenarios, the first is when the end-user distributes the work to a third party, then s/he should ensure that the original author is duly acknowledged and credited. It also applies when the end-user wants to modify the work or create a derivative work.’*

*‘... most open content licences have a standard clause which states that the work is being provided without any warranty or on an “as is” basis. The licensor cannot be in a position to provide any warranty on the work.’*

#### Creative Commons

Most creative commons licences are general – ie they can relate to any type of content or medium.

Creative Commons licences can be completely open – ie allow for all rights – or restricted – ie allow certain rights but impose restrictions as well.

Six types of licence are available (see the following page) and they are presented in three forms:

1. As a Common Deed – one page, plain language summary with relevant icons

2. Legal Code – formal licence in legal language
3. Digital Code – metadata translation of the licence for search engines.

*‘Every licence asserts copyright over the work, and then allows [the author] to determine the manner and extent to which [s/he is] willing to grant people freedoms to [her/his] work.’*

*‘Every licence requires licensees:*

- *To obtain [the author’s] permission to do any of the things that [s/he] may have chosen to restrict.*
- *To keep any copyright notice intact.*
- *Publish the licence with the work or to link to [the author’s] licence from copies of the work.*
- *Not to alter the terms of the licence.*
- *Not to use technology or any other means to restrict other licensees’ lawful uses of the work.’*

*‘Every licence allows licensees (provided they live up to [the author’s] conditions) to:*

- *Copy the work*
- *Distribute the work*
- *Display or perform it publicly*
- *Shift the work into another format as a verbatim copy.’*

*‘Every licence*

- *Applies worldwide*
- *Lasts for the duration of the work’s copyright*
- *Is non-revocable*

Types of Creative Commons licences (logo sourced from the Creative Commons website: <http://creativecommons.org/>; text from ‘*Guide to Open Content Licences*’ [14])



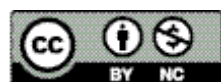
**Attribution:**

The broadest licence possible – it grants the user all the rights



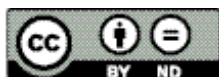
**Attribution-Share Alike:**

The user is granted all rights including the right to make commercial exploitation of the work as well as create derivative works. The only condition is that the same rights have to be granted by the user with respect to the derivative work that s/he produces.



**Attribution-Non commercial:**

All rights are granted, provided the user does not make any commercial use of the work without permission; the user however has the right to make derivative work.

***Attribution-Non commercial-No derivatives:***

The user is allowed to make commercial use of the work, but not allowed to make any derivative works based on the original work.

***Attribution-Non commercial-No derivatives:***

Grants the user no rights apart from the baseline rights, ie the right to use, copy, distribute and perform the work.

***Attribution-Non commercial-Share Alike:***

Similar to the Attribution-Share Alike licence, the only condition imposed here being that there is no commercial use of the work.

However, there is also an argument emerging that CC may not be applicable to spatial data created by government.

Creative Commons relies on the author having copyright in the work being licensed. In the case of spatial information created, maintained and provided by government, where does copyright actually reside?

If multiple agencies have a role in providing the data layers that make up a map, in who does copyright for the map lie?

Can the raw spatial data be copyrighted or only the maps that are produced using it?

European case law on ‘database right’ in spatial data is reviewed in the paper [‘Geospatial databases and the research and education sector in the UK. Designing a licensing strategy for sharing and re-use of data’](#)<sup>9</sup> [21]

The report reviews relevant European case law and concludes that no copyright subsists in the structure of a geospatial database under the European Database Directive (1996), but the contents of such a database are protected from unauthorised extraction and utilisation by the sui generis right in the contents of the database.

Would such a circumstance also apply to spatial information in Victoria?

***GeoCommons***

On 28 May 2007, the web mapping company FortiusOne, will launch GeoCommons, a ‘*place to explore, create and share intelligent maps and geographic data*’.

The data provided through the site will be available under a Creative Commons with Attribution licence. [27]

For further information on GeoCommons, see page 37.

9. <http://edina.ac.uk/projects/grade/gradeDigitalRightsIssues.pdf>

## *Digital Rights Management*

A significant issue for data providers is protection from liability:

*‘Whose responsibility is it if a map program steers a driver down the wrong road and they end up driving off an incomplete high overpass? And whose responsibility is it if an ambulance doesn’t reach an injured person because the destination address was misrepresented on a map?’* (‘Standards group approves geospatial rights model’, GCN, 16 April 2007 [11])

As reported in Government Computer News on 16 April 2007, the Open Geospatial Consortium has approved a Geospatial Digital Rights Management Reference Model.

In its press release OGC *‘defines the framework for Web service mechanisms and rights languages to articulate, manage and protect the rights of all participants in the geographic information marketplace, including the owners of intellectual property and the users who wish to use it.’*

*The OGC says it ‘is an important step toward giving geospatial-data providers the kind of legal protections they need if they’re going to open up their databases to end users.’*

A working group in OGC is looking at the issue of defining ‘quality’ of data. Carl Reed, head of OGC is quoted in the article as saying *‘When you get a map on the screen, what is it useful for? And how do you warn an end user not to use it for certain things and make decisions that may end up being wrong and result in injury?’*

*‘With the approval of the GeoDRM RM the next step is to actually create specific language for agreements. Once vendors and other data providers have the protection of such agreements, [Carl Reed] said, they are likely to be more open about offering the data in ways that it can be put to use.’*

Click on [Geospatial Digital Rights Management Reference Model](http://www.opengeospatial.org/standards/as/geodrrm)<sup>10</sup> to access the document.

What might the strategic and policy implications of the themes described in the preceding pages be?

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10. <http://www.opengeospatial.org/standards/as/geodrrm>

## The nature of innovation

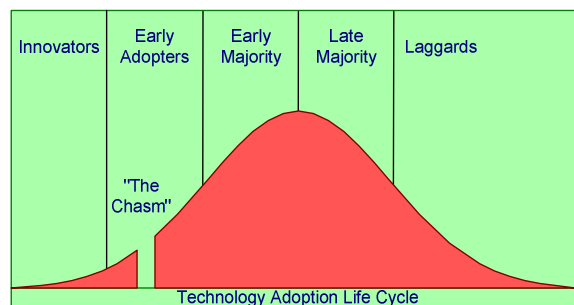
A number of articles have recently appeared discussing the nature of innovation. This has been stimulated by the arrival of innovations such as Google Earth and Microsoft Virtual Earth that have fundamentally changed the way we think about spatial information and how it is being delivered and used.

By understanding the nature of innovation, we can understand the possible ways new products and services may go and how they might affect us.

The CRC-SI's *Discussion paper: know, think, communicate — key elements of Virtual Australia* (September 2005) [15] notes that

*'technical or technological innovation by itself may fail (or the realisation of its benefits be substantially delayed or reduced) if institutional, economic and social impacts are not addressed.'*

Figure 1: Moore's Technology Adoption Lifecycle Model



[Reproduced from the CRC Discussion Paper]

The 'chasm' is a void where many technologies disappear before they enter the mainstream marketplace.

Evolution is described as a stop-start process, with little or no activity over long periods interrupted ('punctuated') by a few significant events.

Major advances in technology have been described as being the beginning of '*a prolonged process of improvements and modifications*'.

These periods of little or no activity, or modification and improvement, can be due to inertia, or economic or administrative factors, such as risk aversion or desire for quick returns on investment.

The two types of changes that impact technology have been described as 'sustaining' and 'disruptive'. The former improve the performance of established products. The latter change things substantially – functionality, delivery mechanisms, architecture; the characteristics of such changes are cheaper, simpler, more convenient to use.

What might the strategic and policy implications of this theme be?

How might the Victorian spatial information industry be affected by innovation, whether here or elsewhere? What will it mean? For whom – content providers, vendors, etc?

## Web 2.0 and the Semantic Web

‘Web 2.0’ is a term coined to categorise internet applications and business forming a ‘participatory’ web, such as blogs, wikis and social networking.

In Victoria, we are starting to consider developing the capacity for on-line editing of spatial data – providing for emerging ‘communities of users’.

The characteristics of Web 2.0, as outlined by Tim O’Reilly [2] appear to include:

- user participation in the way a web site/service develops – eg Wikipedia, blogging
- the web is seen as a platform
- the user controls his/her own data
- services – not software
- more use means greater improvement

Web 2.0 is ‘a system without an owner’, which is ‘tied together by a set of protocols, open standards and agreements for cooperation’.

A key principle is that the more people use a service, the more it automatically improves.

The article discusses the importance of data to Web 2.0 under the heading ‘[Data is the Next Intel Inside](#)’<sup>11</sup>.

*‘Every significant internet application to date has been backed by a specialized database: ... MapQuest’s map databases...’*

This leads to a key question – who owns the data?

O’Reilly argues that gaining business advantage via controlling key data sources is possible, especially if these data sources are expensive to create or amenable to increasing returns via network effects.

A failure to understand the importance of owning an application’s core data will eventually undercut its competitive position. *‘MapQuest pioneered the web mapping category in 1995, yet when Yahoo!, and then Microsoft, and most recently Google, decided to enter the market, they were easily able to offer a competing application simply by licensing the same data.’*

[Who did they licence the data from?]

The article contrasts MapQuest with Amazon.com:

*‘Like competitors such as Barnesandnoble.com, its original database came from ISBN registry provider R.R. Bowker. But unlike MapQuest, Amazon relentlessly enhanced the data, adding publisher-supplied data such as cover images, table of contents, index, and sample material. Even more importantly, they harnessed their users to annotate the data, such that after ten years, Amazon, not Bowker, is the primary source for bibliographic data on books...’*

*‘Imagine if MapQuest had done the same thing, harnessing their users to annotate*

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11. <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html?page=3>

*maps and directions, adding layers of value. It would have been much more difficult for competitors to enter the market just by licensing the base data.'*

*'The recent introduction of Google Maps provides a living laboratory for the competition between application vendors and their data suppliers. Google's lightweight programming model has led to the creation of numerous value-added services in the form of mashups that link Google Maps with other internet-accessible data sources. ...*

*'At present, these mashups are mostly innovative experiments, done by hackers. But entrepreneurial activity follows close behind. And already, one can see that for at least one class of developer, Google has taken the role of data source away from Navteq and inserted themselves as a favored intermediary. We expect to see battles between data suppliers and application vendors in the next few years, as both realize just how important certain classes of data will become as building blocks for Web 2.0 applications.*

*'The race is on to own certain classes of core data: location, identity, calendaring of public events, product identifiers and namespaces. In many cases, where there is significant cost to create the data, there may be an opportunity for an Intel Inside style play, with a single source for the data. In others, the winner will be the company that first reaches critical mass via user aggregation, and turns that aggregated data into a system service.'*

Can data providers in Victoria position themselves in this way?
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### *Making Web 2.0 work*

The [Wikinomics](#)<sup>12</sup> web site blog [1] makes the following comments about Governments' capacity to take up Web 2.0 in a big way.

Governments have been criticised for being too slow to embrace the potential of new communications technologies.

However, it is also recognised that it is a complex undertaking to move government and governance into the digital era.

There are entrenched cultures to deal with, complex institutional legacies, political wrangling, consensus decision-making, management hierarchies, silos of work practices and processes to overcome.

On the other hand, concerns around privacy, security, authentication, and accountability must also be taken into account.

Meanwhile, many efforts to move government services online amount to little more than developing interfaces over the old inefficient government structures and institutions. Citizens, for example, may be able to go to one website to renew their driver's license and pay their taxes, but the bureaucratic machinery behind the scenes remains largely unchanged.

There are many opportunities for governments to get started in leveraging the Web 2.0. For example, there are enormous opportunities to develop new public offerings that would require very few fundamental changes at all. Government

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12. [http://www.socialtext.net/wikinomics/index.cgi?wikinomics\\_beyond\\_business](http://www.socialtext.net/wikinomics/index.cgi?wikinomics_beyond_business)

agencies, for example, are one of the largest sources of public data, and yet most of it is under- or unutilised. This data could provide a platform for new services that would empower citizens to interact with their elected representatives and enable community groups to contribute to public welfare.

The blog gives [Scorecard.org](http://Scorecard.org) (a pollution information site) as an example. This was launched by the Environmental Defense Fund in the US in 1998 to aggregate hundreds of sources of public data to create a nation-wide tool for assessing environmental risks. Visitors to the site can type in their zip code and get instant access to information about pollution sources in their region.

*Online Notification and Edit (ONE)*

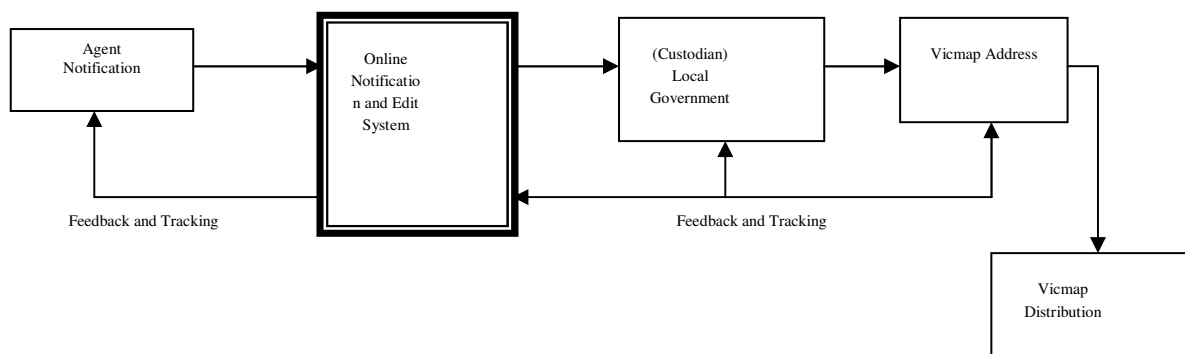
The ONE initiative is aimed at giving a greater role to custodians in approving changes to their digital data in an automated environment, and users the ability to directly report errors in data to custodians. It aims to provide the sort of participatory environment suggested by Web 2.0.

It has emerged out of the experience in trying to meet the growing use of spatial data in a variety of new applications, and its exposure to a much wider audience of users, many of whom are not from a traditional GIS background.

Such growing use is leading to increased demands for delivery of data in much shorter and more convenient timeframes than currently exist and for the quality of the data to be as complete and up-to-date as possible.

The idea behind ONE is an online system for notification and edit that will enable users to notify custodians of errors or inconsistencies in their data or products as well as enable the custodians to maintain their data through a centrally provided system. Over time, the system should deliver real time edit capability and be capable of tracking all transactions transparently for all stakeholders to monitor.

A simple outline of how ONE might work



*The Semantic Web*

Web 3.0 or the ‘Semantic Web’ is about computers becoming capable of analysing all the data on the web.

[Wikipedia](http://en.wikipedia.org/wiki/Semantic_Web)<sup>13</sup> describes it as follows [23]:

*‘Humans are capable of using the Web to carry out tasks such as finding the Finnish word for "car", to reserve a library book, or to search for the cheapest DVD and buy it. However, a computer cannot accomplish the same tasks without*

13. [http://en.wikipedia.org/wiki/Semantic\\_Web](http://en.wikipedia.org/wiki/Semantic_Web)

*human direction because web pages are designed to be read by people, not machines. The semantic web is a vision of information that is understandable by computers, so that they can perform more of the tedium involved in finding, sharing and combining information on the web.*

*‘For example, a computer might be instructed to list the prices of flat screen HDTVs larger than 40 inches with 1080p resolution at shops in the nearest town that are open until 8pm on Tuesday evenings. To do this today requires search engines that are individually tailored to every website being searched. The semantic web provides a common standard (RDF) for websites to publish the relevant information in a more readily machine-processable and integratable form.’*

It was described in an article by Tim Berners-Lee, James Hendler and Ora Lassila in the Scientific American in May 2001: [‘The Semantic Web’](#)<sup>14</sup> [22]

What might the strategic and policy implications of the themes described in the preceding pages be?

What does the idea of owning the core data mean for the traditional providers of data such as government?

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14. <http://www.sciam.com/article.cfm?articleID=00048144-10D2-1C70-84A9809EC588EF21>

## Growing technical power

### Information Management Environment

What are technology and the arrangement of it providing in terms of capability to store, manage, provide and use spatial information?

The CRC's Virtual Australia paper [15] describes a number of data management and technological developments that have the potential to further deliver quantities of spatial information and widen the application to which it can be put.

*'All developers of operational information systems (whether spatial or aspatial) face the challenge of providing complete, accurate and timely information.'*

*'Recent efforts have targeted solutions delivering the 'Real-Time Enterprise'... The objective is ... to create a system that provides complete, correct and current information for all relevant events and objects.'*

*'While IT has traditionally been viewed primarily as a tool for enhancing the efficiency of defined business processes, the Real-Time Enterprise focuses on information — the integration of business information as well as business processes.'*

*'Recent technology developments are enabling the realisation of the Real-Time Enterprise concept. The key areas are Data Integration, Mixed Workloads and Grid Computing. The key approaches to managing data in these three areas are Data Switches, Data Hubs and Data Suites.'*

- **Data integration:** advances are occurring that are enabling IT systems to integrate many different processes and data types (spatial and non-spatial) into a single management environment.

*'Real-Time Enterprise requires businesses to integrate both their processes and their information, so that business processes are not fragmented by technology boundaries that cause delays and devalue the information.'*

- **Mixed workloads:** such data integration can also facilitate the three types of computing workloads – transactions, analysis, collaboration – to be performed simultaneously against shared data (hitherto, data had to be copied from one system to another).

Victoria's approach is for data to be retained by custodians if they wish to continue to manage it themselves. Therefore more sophisticated methods of data management are needed. The CRC describes three types:

- **Grid computing:** enables mixed workloads to be performed against consolidated data using collections of low-cost hardware – replacing high cost dedicated servers and storage – providing scalability and capacity to handle larger quantities of data.
- **Data switches:** using the web to access distributed stores of spatial data without actually bringing the data together. The central switch only holds the metadata.
- **Data hubs:** using two way synchronisation between application and a centralised master database (or hub). Hubs facilitate migration to Data Suites (see below).

- **Data suite:** a network of two or more interconnected processors capable of storing parts of the same database running distributed applications in a grid arrangement.

What might the strategic and policy implications of this theme be?

How do we marshal resources to take advantage of these technical and information management advances to increase the use of spatial information to contribute to improving the way government and business manage their operations?

## Data content

The growing demand for spatial data is resulting in users' requirements for quality beginning to exceed existing standards for a range of spatial data. There is also great potential for this gap to widen further as reliance on spatial data grows correspondingly as its use becomes more widespread, and as it becomes increasingly applied in automated systems (such as emergency response).

With the greater availability of the technology that can deliver spatial information to an expanding user base, including the internet, the demand for immediately available and accurate spatial information will continue to increase.

The focus is also shifting to delivery of business solutions. For spatial information to become ubiquitous it must be integrated into mainstream technology.

Spatial information – particularly property and address – is vital to core services of state and local government.

Quality for these purposes is manifested in 'fitness for purpose', which in turn leads to a range of definitional issues – for whom is the data 'complete', 'current', or 'correct'? How are these to be measured for all users?

This poses serious questions for an organisation responsible for a dataset – how does it determine what that fitness is so that all types of users are catered for? Does it automatically respond to the highest and best use of the data? Does it compromise, and require more sophisticated customers to pay for the additional requirements they are seeking?

Addressing quality is also about relationships – between custodians and users, agreeing standards, and exchanging data according to those standards.

To support this, the focus is on establishing performance targets for the data to give users a basis for assessing the standard of the data.

As the ways in which spatial information is being delivered and the uses to which it is being put grow, users are demanding 'anywhere anytime' data of a quality that meets their needs. The pressure is on to maintain quality and supply the content for these new applications.

But there is an equally important need to educate users about the data – it is not necessarily capable of meeting each and every use to which it is being put. The growing demands for and use of spatial data mean that it is increasingly being asked to meet requirements it was not designed to meet.

Standards are facilitating the exchange of data, with the result that the range of users of spatial information is increasing.

There is also a view that this increasing use will help drive quality improvements.

Successful delivery of new applications to users, and meeting the challenges provided by the growth in spatial information providers, will be dependent on the quality of the data that underpins them.

What might the strategic and policy implications of the themes described above be?  
Has Victoria effectively dealt with the issue of data quality?

## Impact of new ‘business models’

Much spatial information was initially created by an organisation (primarily) government for its own needs, and still is.

Spatial information was not created initially for the purpose of developing value added products by the private sector. But this is now possible with digital spatial information and the internet – once created it can be shared many times over without being diminished.

However, Google and others are putting applications in the hands of users – the ability to create them and make new ones.

With the greater capacity to share spatial information, and for others to use it, greater demands are being placed on data managers.

How can they deal with this?

Are they being asked to do too much?

Is the core constituency in danger of being overtaken?

## Google My Maps

Google has introduced a new mapping feature – as outlined by the Google Maps Blog:

[My Maps](#)<sup>15</sup> enables users to create their own custom [Google Maps](#)<sup>16</sup> ‘just by pointing and clicking. You can add placemarks, draw lines and shapes, and embed text, photos and videos -- all using a simple drag and drop interface. Your map automatically gets a public URL that you can share with your friends and family, or you can also publish your map for inclusion in Google Maps search results. ... The user-created results include KML as well as maps made through My Maps.’

An on-line tutorial is provided:

<http://maps.google.com/help/maps/userguide/index.html>

## IBM ‘Many Eyes’

The article ‘*Sharing Data Visualization*’ [3] reports on IBM’s development of a web site called [Many Eyes](#)<sup>17</sup>, which teaches people how to build their own visualizations.

Its goal, as stated on the web site is to ‘*democratize visualization and to enable a new social kind of data analysis.*’

*‘It is that magical moment we live for: an unwieldy, unyielding data set is transformed into an image on the screen, and suddenly the user can perceive an unexpected pattern. As visualization designers we have witnessed and experienced many of those wondrous sparks. But in recent years, we have become acutely aware that the visualizations and the sparks they generate, take on new value in a social setting. Visualization is a catalyst for discussion and collective insight about data.*

15. <http://maps.google.com/help/maps/userguide/index.html>

16. <http://maps.google.com/>

17. <http://services.alphaworks.ibm.com/manyeyes/app>

*'We all deal with data that we'd like to understand better. It may be as straightforward as a sales spreadsheet or fantasy football stats chart, or as vague as a cluttered email inbox. But a remarkable amount of it has social meaning beyond ourselves. When we share it and discuss it, we understand it in new ways.'*

## GeoCommons

On 17 May 2007, the on-line Directions Magazine reported on the forthcoming release (by the company FortiusOne) of GeoCommons, 'a repository for geodata available for mashups'. The article, 'GeoCommons: Bringing Data and Mashups to Professionals and Citizens Alike' [27]<sup>18</sup>, further reports:

*'GeoCommons is quite a few things rolled into one. It's a website to:*

- *upload, download and search for spatial data*
- *easily create mashups by combining datasets*
- *tell stories that are best told with real data on real maps'*

*'The free site allows users to set up an account and profile, and upload their own datasets (after carefully reading the licensing information). Data must be public domain and can be uploaded in KML or shapefile format. (A future release will create these files from address information, that is, it'll do geocoding.) Datasets can be tagged and include a description, though no formal metadata tool is offered (at this time). Shapefile datasets are converted to KML, GeoCommons' "native" format. Alternatively, users can search for already loaded datasets based on geography and topic. Those datasets are fuel for mashups.'*

*'Saving a map involves giving it a name and description. At that point you can make the map public or private. Maps can be either, but datasets must be public, reinforcing the idea of a "commons." For now, registered users are provided with public URLs for their public maps. In the future, FortiusOne plans to add tools to embed maps in Web pages and blogs.'*

*'FortiusOne has two ways to monetize GeoCommons. One involves a sort of "higher level" fee-based membership for individuals or organizations that want to tell the story around their cause in more detail. An environmental organization might have such a profile to tell its story of conservation or a political group might use it in a campaign to highlight inequities. A second monetization option revolves around those with data they can't (or choose not to) share. They pay a subscription to use the tools of GeoCommons along with their proprietary data.'*

Adena Schutzberg, Executive Editor of Directions Magazine, also comments:

*'This is a truly unique addition to the Web 2.0 world of mapping. I can't think of a real competitor. This is not Google My Maps because you can upload your own datasets. ... It's not a global spatial data infrastructure since there's no government involved!'*

*'So what is it? It's a place to share – not just maps, but data. It's a place to tell stories – stories about the environment, politics, natural disasters, real world topics. And, it's a mapping tool aimed at regular people. Gorman explained that the team took out lots of the high-end geospatial analytical tools in an earlier beta*

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18. [http://www.directionsmag.com/article.php?article\\_id=2465&trv=1](http://www.directionsmag.com/article.php?article_id=2465&trv=1)

*because they confused non-technical users. The plan is to slowly add those in as users become comfortable with the application.'*

*'There are challenges. Will users upload datasets? FortiusOne hopes so and has been seeding GeoCommons with public datasets on its own. Will the data follow the public domain creed? Again, FortiusOne hopes so and has staffers to review datasets and remove them should they be inappropriate (not unlike YouTube). Will enough paying customers step up to fund the free version? FortiusOne is optimistic, especially after the Department of Homeland Security acquired its technology specifically because its non-technical users could combine and use data quickly and easily.'*

*'I suspect geospatial professionals will be very pleased with GeoCommons as it "bridges the gap" between social and consumer mashup tools and the data they create day in, day out. I think at the outset these professionals will be the largest group of data uploaders. Non-technical users, who may be less familiar with shapefiles and KML, will likely first look to existing datasets in GeoCommons to build their maps. There's a nice synergy there. Further, if datasets continue to be regularly uploaded, GeoCommons may become the single search hub for public domain data worldwide.'*

#### Other social networking sites

<http://socialight.com/>:

*'Socialight is a fun, new community that lets you connect in totally new ways - by creating, sharing, and discovering virtual Sticky Notes placed at specific locations using your mobile phone or the web.'*

*'Socialight is about is location-based information. Geeks call it "geo-tagging". With this service, you can create Stickies anywhere in the world for your friends, for everyone, or just for yourself. They can now contain text and photos, and soon you'll be able to add sound clips and video.'*

*'If you are, or fancy yourself to be, an editorial content provider, you can create your own channel. Publish content on our servers using a simple interface, then deliver Stickies to people when and where they're likely to be relevant as part of an opt-in channel.'*

*'As you walk around your city, or travel around the world, you can find Sticky notes that are tied to the places you go. Socialight can notify you on your mobile phone any time you're near a Sticky. As your phone buzzes, it will display the Sticky content, and also allow you to check out some background on the person who posted it. From there, you can instantly respond, leave your own Sticky, or just move on.'*

*'Our goal is to let people share their experiences and ideas from the real world in a new way that we think makes a lot of sense, and for people to build new connections around place.'*

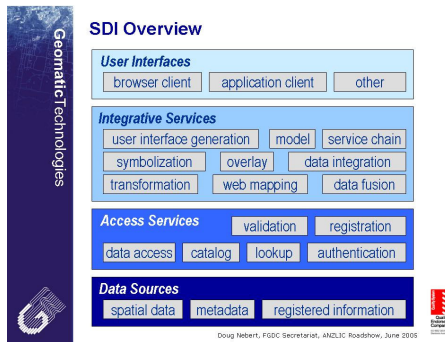
What might the strategic and policy implications of this theme be?

Can Victoria's spatial information strategy effectively respond to the new 'business models' emerging from the increasing capability of individuals to access and use spatial information?

## Institutions

Technological change is occurring rapidly – as evidenced by the examples in the preceding pages of this paper. How are our institutions, incorporating governance, relationships, roles and responsibilities, handling that change?.

At the [Victorian Spatial Council Forum](#)<sup>19</sup> in December 2006, Mark Judd from Geomatic Technologies presented a model for determining how the key players in the spatial information industry (business, government, and academia) can participate in developing the Spatial Data Infrastructure.



In this model (illustrated at left), SDIs have 4 levels – starting from the top: user interfaces; integrative services; access services; and data sources.

The question for each sector of the industry is where are they going to participate?

There will be both opportunities and threats associated with the decision.

Commoditisation, at the top layer (user interfaces) in particular, is starting to happen (eg Google Earth, Microsoft Virtual Earth).

What will this mean for the traditional industry participants?

## Roles and responsibilities

The Victorian Spatial Council has released a set of *Spatial Information Business Principles* that define the roles and responsibilities of the various sectors of the spatial information industry in Victoria in implementing VSIS.

In general, the primary roles of each sector within that overall framework are:

- Government – policies, standards, management framework and principles, management and provision of fundamental data, supporting development of new products by the private sector.
- Private Sector – developing value added products and services, developing markets, promoting new products, Research and Development, managing data according to the principles of VSIS.
- Academia – education, Research and Development.

## Cooperative Models

Two types of coordinating mechanisms feature in managing spatial information development and practice:

- Coordinating bodies – set up with formal mandates or by statute or directive, to set policy and standards, direct investment in data and systems, and/or facilitate access to data.
- Collaborative activities, between two or more organisations – such as joint initiatives to develop data or systems, or facilitate data sharing among the participants.

Coordinating bodies are those such as the Federal Geographic Data Committee in

<sup>19</sup> <http://www.land.vic.gov.au/Land/lnlc2.nsf/LinkView/3EC59FD269681B73CA2572890004751BFBDF6BAC5FF0C6BCA2571E000184EC4>

the US, which was established under OMB Circular No. A-16 (issued in 1992, updated 2002) as *'the interagency coordinating body for NSDI-related activities...'* [25]. The Circular enshrines a coordinated approach between *'federal, tribal, state, local government, and academic institutions, as well as a broad array of private sector geographic, statistical, demographic, and other business information providers and users'* to build *'an effective NSDI'*.

The Digital National Framework in the United Kingdom illustrates a collaborative approach. This initiative, which was launched in 2000, aims to *'to support greater connectivity across all kinds of business information managed by separate organisations, where that information has "location" as a common denominator.'* [26]

It is relying on participants having the incentive to join and, when they do so, being supported by *'enabling principles and operations rules that underpin and facilitate the integration of geo-referenced information from multiple sources': 'Implementation of this concept and principles requires collaboration across all GI sectors and beyond. The collaborators require some basic rules to assert a level of coherence and consistency in the implementation of the framework and in its operation; linking many distributed databases and supporting better information connectivity'. 'In securing further progress, it is not expected that there will be a need for a formal committee or expansive program structure...'*. Rather, it will continue to rely on collaboration, which *'will be even more important in the future'*.

What might the strategic and policy implications of this theme be?

How can institutions be given the capacity to act quickly in response to changes?

Can they be sufficiently flexible to adapt if need be?

Are innovative entrepreneurs pushing the boundaries faster than institutions can deal with?

Is our policy framework keeping up with innovation – what is driving what?

Should institutions limit their focus to standards and content, and let innovation take its course?

Have we got the level of cooperation right in Victoria? How could it be improved to meet the new challenges facing the spatial information industry?

## VSC Forum

In December 2006, the VSC's forum 'Where to next for the spatial information industry?' addressed the topic of how recent significant changes in the availability and delivery of spatial information might impact on the policy and strategic direction for Victoria.

The full proceedings of the Forum have been published on the VSC's web pages at [www.land.vic.gov.au/spatial](http://www.land.vic.gov.au/spatial).

The key topics raised in the Forum's open discussion session are summarised as follows.

*How do we integrate the potential multiple SDIs, and what's the role of an overarching strategy, such as VSIS, to bring them together?*

*Data – content and quality – will still be important elements of the forthcoming strategy. Users will be sceptical about the new applications unless the data that underpins them is of good quality, reliable and consistent.*

*Users do not always understand the limitation of the data they are using – whether the purpose for which it was created matches the use to which they want to put it.*

*We should be making data available – with all its limitations and 'imperfections', get it used by the maximum number of people, and from there be able to promote the message that further investment is required.*

*People still don't know what to look for. So access must be supported by 'awareness' and 'discovery'.*

*The industry needs to understand how the SDI hierarchy works to be able to know how it can participate in the ongoing development of spatial applications.*

*It will be the standards that underpin the SDI hierarchy and the links between the four levels.*

*The industry needs to understand the 'commodisation' of spatial information and what it means and what impact that will have.*

*Spatial information has to be utilised in a way that adds value and improves business outcomes, or government outcomes or community outcomes.*

*In lots of ways, users are only interested in getting what they want out of the applications/interfaces they access – they don't care about the spatial information and all that goes behind them as long as they get the results.*

## REFERENCES

- [1] [http://www.kurzweilai.net/news/frame.html?main=/news/news\\_single.html?id%3D6570](http://www.kurzweilai.net/news/frame.html?main=/news/news_single.html?id%3D6570)
- [2] Tim O'Reilly (2005), *What is Web 2.0?*, <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html>
- [3] Kate Green (2007a), 'Sharing Data Visualization', MIT Technology Review, 11 April 2007, <http://www.technologyreview.com/Infotech/18516/>
- [4] Greene, Kate (2007b), 'A Wireless Sensor City', MIT Technology Review, 13 April 2007, <http://www.technologyreview.com/Infotech/18533/>
- [5] European Commission (2007a), *Fact Sheet 54: Radio Frequency Identification RFID - The Internet of things*, March 2007, [http://ec.europa.eu/information\\_society/newsroom/cf/itemlongdetail.cfm?item\\_id=2513](http://ec.europa.eu/information_society/newsroom/cf/itemlongdetail.cfm?item_id=2513)
- [6] Buckley, John (2006), *From RFID to the Internet of Thing: Pervasive Networked Systems*, Report of the Conference organised by DG Information Society and Media, Networks and Communication Technologies Directorate, March 2006, <http://www.rfidconsultation.eu/workshops/from-rfid-to-the-internet-of-things-march-6-and-7/113.html>
- [7] European Commission (2007b), *Radio Frequency Identification (RFID) in Europe: steps towards a policy framework*, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, March 2007, [http://ec.europa.eu/information\\_society/policy/rfid/index\\_en.htm](http://ec.europa.eu/information_society/policy/rfid/index_en.htm)
- [8] European Commission (2006), *Radio Frequency Identification Devices (RFID): Frequently Asked Questions on the Commission's Public Consultation*, <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/06/378&format=HTML&aged=0&language=EN&guiLanguage=en>
- [9] New York Mayor's Office of Operations home page: <http://www.nyc.gov/html/ops/html/home/home.shtml>
- [10] New York Department of Information Technology and Telecommunications web site: [http://www.nyc.gov/html/doitt/html/about/about\\_doitt.shtml](http://www.nyc.gov/html/doitt/html/about/about_doitt.shtml)
- [11] Patrick Marshall (2007), *Standards group approves geospatial rights model*, Government Computer News, 16 April 2007,
- [12] European Commission (2004), *Exploiting the Potential of Europe's Public Sector Information*, Directorate General for the Information Society, May 2004, [http://ec.europa.eu/information\\_society/policy/psi/docs/pdfs/brochure/psi\\_brochure\\_en.pdf](http://ec.europa.eu/information_society/policy/psi/docs/pdfs/brochure/psi_brochure_en.pdf)
- [13] European Union (2003), *Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information*, [http://ec.europa.eu/information\\_society/policy/psi/docs/pdfs/directive/psi\\_directive\\_en.pdf](http://ec.europa.eu/information_society/policy/psi/docs/pdfs/directive/psi_directive_en.pdf)
- [14] Lawrence Liang (2005), *Guide to Open Content Licences*, v1.2, June 2005, Piet Zwart Institute, Willem de Kooning Academy Hogeschool Rotterdam, [http://pzwart.wdka.hro.nl/mdr/research/liang/open\\_content\\_guide](http://pzwart.wdka.hro.nl/mdr/research/liang/open_content_guide)

- [15] CRC-SI (2005), *Discussion paper: know, think, communicate — key elements of Virtual Australia*, Cooperative Research Centre for Spatial Information, September 2005, Bruce Thompson and Dr Tai On Chan
- [16] Steven Deare (2007), CeBIT: Nairn talks up govt blogs, ZDNet Australia, 2 May 2007, <http://www.zdnet.com.au/news/software/soa/CeBIT-Nairn-talks-up-govt-blogs/0,130061733,339275205,00.htm?ref=search>
- [17] Tom Karygiannis et al (2007), *Guidelines for Securing Radio Frequency Identification (RFID) Systems*, National Institute of Standards and Technology, Technology Administration, US Department of Commerce, Special Publication 800-98, April 2007, [http://csrc.nist.gov/publications/nistpubs/800-98/SP800-98\\_RFID-2007.pdf](http://csrc.nist.gov/publications/nistpubs/800-98/SP800-98_RFID-2007.pdf)
- [18] Jessica Smith, et al (2001), *Location Based Services – the Underlying Technology*, The Third International Symposium on Mobile Mapping Technology, January 3-5, Cairo, Egypt, [http://www.geom.unimelb.edu.au/research/SDI\\_research/publications/publisdi.php](http://www.geom.unimelb.edu.au/research/SDI_research/publications/publisdi.php)
- [19] John Markoff (2005), *Marrying Maps to Data for a New Web Service*, New York Times, 18 July 2005, <http://www.nytimes.com/2005/07/18/technology/18maps.html?ex=1178942400&en=f8826e1529afaf7&ei=5070>
- [20] Peter Bradwell et al (2007), *Future Planners: Propositions for the next age of planning*, Demos Think Tank, February 2007, <http://www.demos.co.uk/publications/futureplannersreport>
- [21] Charlotte Waelde, Mags McGinley (2007), *Designing a licensing strategy for sharing and re-use of data*, EDINA, March 2007, <http://edina.ac.uk/projects/grade/>
- [22] Tim Berners-Lee, et al (2001), *The Semantic Web*, Scientific American, 17 May 2001, <http://www.sciam.com/article.cfm?articleID=00048144-10D2-1C70-84A9809EC588EF21>
- [23] Wikipedia, *Semantic Web*, [http://en.wikipedia.org/wiki/Semantic\\_Web](http://en.wikipedia.org/wiki/Semantic_Web)
- [24] AGIMO (2007), *Nairn announces move towards eDemocracy*, 16 March 2007, [http://www.agimo.gov.au/media/2007/march/Nairn\\_announces\\_move\\_towards\\_eDemocracy](http://www.agimo.gov.au/media/2007/march/Nairn_announces_move_towards_eDemocracy)
- [25] OMB (2002), Circular No. A-16, Office of Management and Budget, Washington DC, [http://www.whitehouse.gov/omb/circulars/a016/a016\\_rev.html](http://www.whitehouse.gov/omb/circulars/a016/a016_rev.html)
- [26] Ordnance Survey (2004), *The Digital National Framework – evolving a framework for interoperability across all kinds of information*, A White Paper by Ordnance Survey, [www.ordnancesurvey.co.uk](http://www.ordnancesurvey.co.uk)
- [27] Adena Schutzberg (2007), *GeoCommons: Bringing Data and Mashups to Professionals and Citizens Alike*, Directions Magazine, 17 May 2007, [http://www.directionsmag.com/article.php?article\\_id=2465&trv=1](http://www.directionsmag.com/article.php?article_id=2465&trv=1)

