

PRESENTATION TO SURVEYING AND SPATIAL INFORMATION VICTORIA SUMMIT – 17 SEPTEMBER 2008

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Words of introduction...

Introduction

In May this year, the Victorian Spatial Council published its first Victorian Spatial Information Strategy for the years 2008 to 2010.

In it, we have set out the key challenges the spatial information community is facing now and the strategic directions for addressing them in the next three years.

The Strategy sets out what the Council sees as important for achieving 'Spatial enablement', in other words 'embedding location information in everything we do'.

We are working in a landscape in which:

- People are deploying technology in new ways, and creating new ways of interacting with each other
- Spatial information and technologies will be key tools because we define many of our relationships by place
- Bandwidth, computer power and information creation are growing exponentially, and new developments based on them are being made by all sorts of developers – even individuals.

- These developments are not slowing down – but we will not realise their promise without the appropriate integrating frameworks and technologies.
- At the same time, none of the developments using spatial information are possible without the fundamental ingredient – the data.
- All of our responses must be underpinned by a robust and consistent approach to the management of that data to support its use

Such a management approach or framework, must ensure data is fit for purpose (including quality and accuracy), accessible and available.

The challenges posed by working in such a landscape are set out in the document, as is the Council's response in the following 4 integrated strategic directions.

1. Creating a framework in which the use of spatial information can flourish.
2. Adopting an inclusive approach to the management of spatial information.
3. Developing the spatial information community through collaboration and partnerships.

And in particular,

4. Maintaining the foundations for spatial information management – that is, ensuring that spatial data is being managed and made available in a way that facilitates and encourages its use.

One of the keys to this foundation is Position, so in the Strategy the Council recommends completion of a Positioning and Location Policy.

In my remarks today, I would like to outline the start we have made with regard to Positioning and Location, highlight the key principles set out in a recently completed draft positioning policy, and foreshadow the next steps the Council intends to take.

The trend toward positioning and location technologies

Why this interest in position and location?

VSIS highlights a series of ‘convergences’ that are creating new uses and markets for spatial data, including Location and the positioning infrastructure on which it is based, such as:

- Creation of new products and services based on the increasing connectivity of personal information devices (such as mobile phones and GPS units), digital knowledge management, and electronic commerce, and
- The convergence of GIS, GPS, remote sensing technologies, mapping, and other capabilities to create ‘location-based services’.

These ‘convergences’ are in turn being driven by what VSIS calls ‘forces’, such as:

- The digitising and instant availability of content
- Delivery of dramatically increased functionality into ever smaller devices
- Reductions in price arising from new communications technology and rapid deregulation of the global telecommunications industry
- The growth of digital bandwidth

Together these convergences and forces are contributing to the growth in the development and use of positioning and location, such as Wi-Fi, RFID, sensors, Ultra Wideband and other intelligent devices.

Here are 4 random illustrations of the extent to which positioning and location devices are making an impact:

- The number of RFIDs in use is exploding – according to the European Union, the global RFID market could be almost ten times the size that it was in 2007.
- The incorporation of positioning into mobile devices is facilitating growth in the tracking of increasing numbers of people – 60% of the worldwide cellular population by 2010 suggests Gartner Research.
- Spatial data and sensor technology will allow us to improve the way we manage our environment.
- And they will lead to significant improvements in the productivity of our agricultural sector and lessening its impact on the environment – as suggested by numerous studies reported by the Allen Consulting Group in the 2007 study *‘The Economic Benefits of making GPSnet available to Victorian agriculture’*.

We are seeing that people are increasingly capable of collecting positioning/location information themselves, and using them in a wide range of applications. And the availability of a growing number of GNSS satellite constellations – from the Europeans, Russians, Chinese and others – will accelerate take up and improve performance of the traditional positioning devices.

As a result, the numbers of applications to which positioning and location information can be put will grow – in health care, manufacturing, environmental monitoring and management, and agriculture.

Benefits

The Benefits of such capability are instinctively attractive: we can

- Track progress
- Measure what is happening and when at a location
- Guide vehicles
- Do things more accurately, cheaply, efficiently

And

- Reduce our impact on the environment

Key issues

But questions arise:

- What are the implications of these developments?
- How accurate is the positioning through technology – can we have confidence that the resulting measurements are fit for purpose?
- How are Privacy, OHS, and IR affected?
- Can the use of positioning information in legal and commercial environments be supported?
- Can we meet the differing requirements and expectations of an increasing range of users?

So, while the positioning technology is either mature, or maturing, what is currently lacking is a policy framework to allow the best use of this information.

The Challenge

As suggested by my preceding remarks, such a policy framework needs to

- provide for a range of positioning technologies
- allow integration of complementary technologies
- Meet a range of user requirements and expectations. For example surveying, construction, engineering and precision agriculture require high precision, while recreational activities such as bushwalking may be far less demanding.
- Provide 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.

The Council is developing a Positioning and Location Policy which will aim to provide a unified framework for the determination and use of positioning and location information to both support the development of Victoria's positioning network and the range of uses of the information derived from it, and address the implications of the increasing use of location technologies.

Positioning Policy

Development of a positioning policy began with the engagement of the CRC-SI in 2006-07, who were given a brief to prepare a policy, within Victoria's Spatial Information Management Framework, which provides a high-level, state-wide framework for the determination and use of position information.

The draft policy that has been developed addresses key principles under **‘positioning infrastructure’** and **‘fitness for purpose’** of derived locations.

In the policy,

- ‘Positioning infrastructure’ encompasses all of the components necessary for a positioning system to determine and make available the location of a target object.

This must include

- the certified reference markers to which the position is related, for example GDA and Regulation 13
- contextual data and user interfaces for utilising the location (such as maps and navigation instructions)
- the communications and regulatory requirements necessary for the system’s operation

And

- the positioning system itself (i.e. the technology) – including transmitters or reference markers, augmentation services to provide an indication of integrity and reliability, and receivers to ‘capture’ the positioning signals

‘Fitness for purpose’ focuses on those attributes considered essential to define a location’s suitability for its intended purpose.

In particular, a position’s quality is fundamental to its use, but quality will have a different definition for each user: to some it will relate to accuracy, while to others it will relate to the continuity and integrity of the service.

Ultimately, however, the quality of a position will help to define its suitability for a particular purpose.

In order to maximise the benefits of positioning and the enabling infrastructure, and provide assurance to users of the fitness for purpose of the position outputs, the draft policy proposes a number of principles to guide the determination and use of position information.

Starting with the *Positioning infrastructure*,

- Its function is to determine the position of target objects

And it should be

- domestically and internationally interoperable and together support all forms of positioning,
- implemented, monitored and maintained in such a way that they complement and are compatible with one another,
- the responsibility of a nominated custodian.

Fitness for purpose

Under fitness for purpose,

- Positions should be able to be relied upon with certainty (ie they should be authoritative, accurate, traceable)
- A user should be able to determine when and where he or she requires it and it should be accessible to users of all abilities
- Positions should be suitable for integration with other datasets, while positions generated from one positioning infrastructure should be compatible with those generated from another
- A calculated position should be close to its true position
- There should be consistency in repeated observations (under identical conditions)

- The positioning system's availability should be communicated, that is, it should provide warnings of errors/failures
- Those responsible for determining positions must ensure that the use or re-use of any position information conforms to the relevant legal, including privacy, guidelines

The policy has been prepared with a number of requirements in mind:

- It needs to be sufficiently broad to accommodate the wide array of positioning systems now available, such as those outlined earlier, encompassing all possible positioning technologies as well as the many and varied uses of position information.
- So that a wide variety of positioning uses can be supported, it is of key importance that various positioning infrastructures and their components are able to coexist without interference or degradation of individual services.
- Regulatory requirements (e.g. allocation of radio frequency spectrum for the transmission of a positioning system's information) must be accommodated in a positioning infrastructure.
- And both existing and future positioning systems must be supported.

The policy seeks to signpost opportunities and challenges that stem from the use of position information and in doing so endeavours to identify key issues that will require more attention in the future.

It is proposed that industry sectors will be responsible for developing policies, procedures and/or best practice guidelines to offer realisation of the principles outlined in the policy for their own circumstances.

Other issues

There are also other issues that emerge from the use of positioning information.

The policy we have been looking at so far deals with the technology. Other issues arising from the use of position information to monitor people's movements can have OHS, industrial relation and privacy implications.

These are not addressed by the current policy, but will need to be addressed over time.

One aspect that will be developed further by the proposed policy is the spectrum that starts with position and leads to 'location'.

For the present, we are treating 'position' and 'location' as separate, but related, concepts:

- 'position' will refer to measurement of x and y coordinates through the use of positioning technologies such as GPS or GNSS, while
- 'location' will refer to the derivative of a position.

Next steps

It is our aim to present a discussion on location, as well as the draft positioning policy, to a forum of invited stakeholders before the end of the year, to test the themes and commence a period of validation prior to publication of a final Positioning and Location Policy.

The Council recognises that the policy's principles will be of varying relevance to different industry sectors and applications (for example the necessity for the infrastructure to be open may have little applicability in a hospital environment where privacy and confidentiality are of key importance).

At the same time, it is anticipated that industry-specific policies, procedures and/or best practice guidelines will identify the principles of relevance to each industry sector, providing practical recommendations by which the overall policy's principles can be achieved.

It is intended that the final Positioning and Location Policy will form part of the Victorian Spatial Information Strategy and the Spatial Information Management Framework, to support our aim of realising Victoria's environmental, economic and social goals through the provision and application of spatial information, in this case locations generated by positioning systems.

Additionally, the process of developing the policy will aim to identify the opportunities and challenges that stem from the use of positioning and location information and as a result, identify key issues that will require more attention in the future.

I look forward to presenting the outcomes of this initiative – in the form of a Positioning and Location Policy for Victoria – to you in due course.

Thank you.