



VICTORIAN SPATIAL COUNCIL

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iTransport Submissions
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Dear Sir/Madam

SUBMISSION IN RESPONSE TO ITRANSPORT DISCUSSION PAPER

The Victorian Spatial Council (VSC) is pleased to make the following submission to the Victorian Government *iTransport Discussion Paper*.

The Victorian Spatial Council is Victoria's policy setting body for spatial information in Victoria.

It is a collaborative venture of the whole spatial information community (public, private and academic sectors) to provide a coordinated approach to policy and spatial information management, and facilitate opportunities for partnerships, collaboration, cooperation and education to develop spatial information and grow its use.

The Council develops the Victorian Spatial Information Strategy, which sets the strategic direction for spatial information and implementing policies and standards for the whole spatial information community, including Government.

Through its current 2008-2010 Strategy, the Council is seeking to support the creation of the conditions in which the right frameworks, standards and technical developments are in place to ensure that spatial information is accessible, and is managed and made available in a way that facilitates and encourages its use, and is clearly understood by users.

In relation to the matters raised in the discussion paper, the Council believes that policy frameworks governing positioning and information management are required to support making the best of ITS and the information that underpins it. Therefore it supports the view expressed in the Discussion Paper on the 'need for a policy-led approach to technology in the transport sector' (p.8).

The comments in the following pages set out proposed approaches for taking advantage of positioning and information management to improve their quality and usefulness, and how they may be applied to ITS and the objectives for iTransport outlined in the Discussion Paper.

The Council would welcome the opportunity to discuss its submission further should the opportunity arise, and to work with Government to develop appropriate guidelines and principles for positioning to support the Intelligent Transport Sector, and to apply its Spatial Information Management Framework to the management and delivery of the information described in the Discussion Paper.

In the meantime, further information about the Council and its activities is available from its web site at www.victorianspatialcouncil.org.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Olaf Hedberg'.

Olaf Hedberg, AM
Independent Chair

Victorian Spatial Council submission to the Victorian Government's *iTransport Discussion Paper*

Introductory Remarks

The *iTransport Discussion Paper* sets out a number of examples of how Intelligent Transport Systems (ITS) are being 'embraced' and the opportunities their evolution provides.

However, these opportunities also bring challenges. The Victorian Spatial Council has a particular interest in the underlying positioning infrastructure, and the management arrangements that ensure information is available and able to be used.

In relation to *positioning*, critical issues it has been considering, which are also relevant to the Discussion Paper, are the accuracy of positioning through technology, whether users can be confident that the resulting measurements are fit for their purpose, whether the use of positioning information in legal and commercial environments can be supported, meeting the differing requirements and expectations of an increasing range of users, and in the policies and standards needed to deliver positioning services to users.

For *information management*, the Council has developed a comprehensive foundation for spatial information management that will ensure that the data is being managed and made available in a way that facilitates and encourages its use, and is clearly understood by users.

The following pages outline the Council's current thinking on the issues associated with positioning and information management, and the responses it is pursuing.

They have direct relevance to, and can assist in addressing, the Discussion Paper's issues for consideration relating to Privacy, Standards and Specifications, Legal and Regulatory Aspects, and Managing Data and Information.

Both will ensure that the best use can be made of the technology and information proposals set out in the Discussion Paper to develop Victoria's transport network.

1. Positioning Infrastructure and Technology

The Victorian Government is already a leader in the development and management of positioning infrastructure and services and has already undertaken major work in this area with transport agencies.

(The Council notes that the discussion paper refers to GPS, however a growing number of other satellite constellations, under the collective title of Global Navigation Satellite Systems (GNSS), from the Europeans, Russians, Chinese and others, are becoming available. As they do, their availability will improve the performance of the traditional positioning devices and accelerate take up of positioning technologies.)

It manages and develops the Vicmap Position-GPSnet network of Continuously Operating Reference Stations (CORS) that provides positioning information for location based services applications, including ITS.

Vicmap Position-GPSnet provides state-wide GNSS satellite position correction data to users in real time and for post-processing.

The Department of Sustainability and Environment (DSE) has coordinated and facilitated the development of the network since 1996 in cooperation with industry, academia and the general community.

The GPSnet infrastructure generates a range of satellite position correction services including a Networked-RTK (NRTK) service with $\pm 2\text{cm}$ horizontal accuracy across Melbourne and environs, and a state-wide Networked-DGNSS service with sub-metre positional accuracy. By 2011, the NRTK service will be available throughout Victoria as a result of the Positioning Regional Victoria initiative (for further information, refer to the DSE web site: www.dse.vic.gov.au/GPSnet.)

The graphic presented in the Attachment illustrates the importance of positioning (and spatial information more generally) to a range of real world activities, including transport.

Current and future uses of positioning services in Victoria

Vicmap Position-GPSnet has already contributed to the completion of some Intelligent Transport related objectives in Victoria, such as the conduct of precise real time field surveys of crossings throughout the State as part of the recent rail crossing upgrades; and use of real time positioning services to support precise ‘as constructed surveys’ by VicRoads surveyors as a prelude to the Monash-CityLink-Westgate upgrade.

It is also providing high accuracy real time satellite guidance services for low speed dynamic platforms in the form of tractors for precision agriculture at below 2cm level and has also been used in the Channel Deepening project.

In addition, the Cooperative Research Centre for Spatial information (CRCSI) and DSE are considering undertaking a research initiative into the use of GPSnet for higher speed platforms such as vehicles and aircraft. (Further information on the CRCSI is available from <http://www.crcsi.com.au/>; it is also worth noting that two of the main GNSS industry manufacturers operating in Australia are represented on the industry consortium that is a partner in the CRC.)

In the future Vicmap Position-GPSnet real time and post processing services will be suitable for application in a range of areas such as the upgrading and management of the Westgate Bridge, assisted vehicle steering for ‘car platooning’ (reducing congestion and increasing safety on the roads), high accuracy road lane mapping, ‘virtual’ anywhere real time road tolling, ‘Smarter’ Bus solutions for lane keeping in mass transit only lanes, etc.

The requirement for legally traceable positions under Regulation 13 of the *National Measurement Act* also provides the opportunity to use Vicmap Position-GPSnet on iTransport applications that require legal status. For example, Point to Point cameras have and are increasingly being deployed to monitor vehicle speeds, while road legislation requires a legally traceable, curvilinear distance to be determined between the cameras. Vicmap Position-GPSnet can be used for this and similar applications.

Positioning Policy

While the positioning technology is either mature or maturing, as the examples above demonstrate, there is no policy framework to allow the best use of this information and address issues such as:

- the accuracy of positioning through technology and users' ability to be confident that the resulting measurements are fit for purpose
- the OHS, industrial relation and privacy implications of using position information to monitor people's movements
- whether the use of positioning information in legal and commercial environments can be supported
- meeting the differing requirements and expectations for quality and accuracy of an increasing range of users (for example transport, surveying, construction, engineering and precision agriculture require high precision, while recreational activities such as bushwalking may be far less demanding)

The Victorian Spatial Council has developed a draft policy 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. (The policy has also been taken up at a national level by ANZLIC-the Spatial Information Council as the basis for developing a National Positioning Infrastructure Policy.)

The key features of this policy are outlined below. In particular it

- provides for a range of positioning technologies,
- allows integration of complementary technologies,
- meets a range of user requirements and expectations, and
- provides for certainty (including legal traceability of both the measurements of position and the spatial datasets derived from them or used in conjunction with them)

Its principles are intended to be generic enough to be widely applicable, but supported by detailed policy and guidelines for relevant sectors, such as transport.

The use of positioning in ITS will require consideration of the capacity of the positioning *infrastructure* used and the *fitness for purpose* of the locations derived from that infrastructure.

The draft policy addresses key principles under both these categories.

Positioning Infrastructure

This encompasses all of the components necessary for a positioning system to determine and make available the location of a target object, including

- the certified reference markers to which the position is related and that ensure a position is reliable and legally traceable
- contextual data and interfaces that make use of the location, such as maps and navigation instructions
- the communications and regulatory requirements necessary for the system's operation
- the technology – including the receivers to 'capture' the positioning signals

The policy defines the infrastructure's function as being to determine the position of target objects, and that it should be

- able to support positioning systems of varying technologies and qualities
- domestically and internationally interoperable and together support all forms of positioning
- implemented, monitored and maintained in such a way that different forms of positioning complement and are compatible with one another, and
- the responsibility of a nominated custodian

Fitness for Purpose

This category focuses on enabling a user to define a location's suitability for the purpose to which he/she intends to put it.

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.

The policy and principles for this category are

- positions should be able to be relied on with certainty (ie they should be authoritative, accurate, traceable)
- a user should be able to determine when and where he or she requires a position 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 their use or re-use conforms to the relevant legal, including privacy, guidelines

The Council's Positioning 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
- various positioning infrastructures and their components should be able to coexist without interference or degradation of individual services so that a wide variety of positioning uses can be supported
- 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
- 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 intended to be a generic policy that can be applied broadly, and within which industry sectors can develop policies, procedures and/or best practice guidelines to realise its objectives for their own circumstances.

To that end, the Council would welcome the opportunity to work with the Government to adopt the Policy as the standard for the use of positioning in ITS, and develop the specific guidelines and principles to support the Intelligent Transport Sector.

2. Information Management Framework

In relation to data and information, the Council notes that the Discussion Paper states:

Continued advances in ITS mean more and more information is collected, stored and analysed, from a variety of sources. With such large quantities of information, good data and information management practices become particularly important. To maximise benefits, data needs to be managed in a way that allows its use in other applications.

The Council concurs with this conclusion.

It also agrees with the Paper's acknowledgement that

With such large quantities of information, good data and information management practices become particularly important. To maximise benefits, data needs to be managed in a way that allows its use in other applications.

The Discussion Paper also refers to the role of government being to

ensure data is made publicly available... A set of guidelines would be established to ensure the provision of data by public transport authorities and contractors.

Victoria has a mature policy and management framework that provides the basis for meeting these conditions. (While it has been created for spatial information, the framework can be equally applied to non-spatial information.)

The VSC has developed a Spatial Information Management Framework that is capable of addressing the concerns/aspirations raised in the Discussion Paper. (Full details are available from the Council's web site at <http://www.victorianspatialcouncil.org>.)

The following remarks set out the major features of this Framework and are intended to provide an illustration of a comprehensive management approach that can support the use of information as set out by the *iTransport Discussion Paper*.

The Spatial Information Management Framework sets out a core set of basic requirements for managing spatial information, representing 'best practice'. It can provide a basis for the information management requirements identified in the Discussion Paper. In particular, it incorporates policies and principles for custodianship of information; describing information and publishing associated

metadata; establishing and documenting quality requirements and levels; pricing and licensing requirements; and access and distribution of the information.

The critical principle is that of custodianship, under which all spatial datasets will have identifiable custodians who will maintain them according to the information management principles of data quality, metadata, awareness, access, pricing and licensing, and privacy.

Custodians will, *inter alia*,

- collect, as a minimum, core metadata elements, as defined by International Standards translated for use in Australia; include metadata with data distributed to users; and publish metadata for their dataset(s) in the appropriate spatial data directories
- raise awareness of their spatial data by publishing metadata and product specifications, and making their metadata available through the Victorian Spatial Data Directory (VSDD)
- price their spatial information according to a consistent pricing policy, and adopt standard licence conditions
- recognise privacy requirements in the management of their spatial information

They will also ensure that their data is capable of being made available and accessible through multiple access and distribution mechanisms.

The Framework supports rigorous information management, while also giving custodians the flexibility and confidence to release their data. It does this by:

- giving them tools to manage their information and meet growing demands for easily accessible data that is fit for purpose
- enabling information to be made available
- providing for standardisation so that duplication of information is reduced and authoritative sources can be created
- improving data management practices
- making information sharing possible – giving them confidence that sharing their data has benefits to them as well as users

The VSC believes that adopting this Framework will provide a mechanism to meet the goals for information availability set out in the Discussion Paper, such as

- making information available to users of the transport network
- linking data from different road operators and public transport companies
- generating reliable data, data processing and transmission of the resulting information to transport users, ie creating 'better informed transport users' (p.23)
- providing reliable and real-time information

The Council would welcome the opportunity to work with Government to apply this Framework to the management and delivery of the information described in the Discussion Paper.

ATTACHMENT – THE IMPORTANCE OF POSITIONING TO A RANGE OF REAL-WORLD ACTIVITIES – INCLUDING TRANSPORT

