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Presented Paper

Converging Paths to an Australian SDI

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Abstract

Australia has been pursuing a national Spatial Data Infrastructure (SDI) since 1996. Much has happened, but the original view of a single approach to an “ASDI” has given way to a multi-path approach. Current efforts are based on incremental progress being achieved through a number of initiatives. These initiatives differ through their implementation by various sub-national jurisdictions, communities of practice and application areas.

Existing initiatives include State-based SDI, a national data integration and marketing body and national frameworks for street address, elevation and land conveyancing systems. New projects have emerged that address the need for spatial information in national policy agendas such as public safety, social inclusion and climate change.

While pragmatic, will this approach address the fundamental issues at the core of delivering sustainable governance, best practice and access that define a national SDI? Will the paths converge? This paper gives an overview of progress and tries to draw conclusions about creation of a national SDI through this approach.

Keywords: SDI, national, policy, applications

Disclaimer: The commentary provided in this paper is meant to elicit discussion and debate. It does not necessarily represent the views of any particular body.

1. WHERE ARE WE HEADING?

The Australian Spatial Data Infrastructure (see <http://www.anzlic.org.au/asdi/asdimain.htm>) concept is designed to empower users by facilitating ready access to spatially referenced information, no matter where it is held. The Australian national, State and Territory governments, under the auspices of ANZLIC–The Spatial Information Council, initiated the concept in 1996.

ANZLIC is the peak intergovernmental council for spatial data in Australia and New Zealand. It has facilitated the ASDI and demonstrated how it can break down institutional, policy and technological barriers and provide highly valued spatial information services directly to users. It also pointed to improved efficiencies and cost savings to users of spatial information through interactions with the ASDI. This is of particular value to addressing whole-of-government and inter-jurisdictional issues, including those relating to environmental sustainability, natural resources management, community safety and disaster management.

Since 1996, there has been considerable discussion and effort to develop the ASDI concept. Some elements have been implemented, including best practice guidelines, action agendas and tools such as the Australian Spatial Data Directory (ASDD). It is fair to say that most action has been focussed on the government sector. ANZLIC has sought to align where possible the significant investment in spatial data infrastructures being developed at sub-national level by the eight State and Territory governments, while mobilising support and active involvement from all spatial information players including the commercial and academic sectors and all users of spatial resources.

Relationship management through institutional and partnership building has been a characteristic of the spatial information industry in Australia for the last decade. Emphasis has been on developing both formal and informal partnership arrangements and where possible, consolidating these arrangements by creating sustainable structures, institutions or programs. Key ongoing arrangements at national level have included:

- Creating fundamental national data sets derived by integrating those held by individual government agencies and pursuing value adding by the private sector, the Public Sector Mapping Agencies forming a private company PSMA Australia Limited (circa 2000).
- A cross-sector industry strategy, the Spatial Information Industry Action Agenda (2001) recognising the need for public and private sectors to work together.
- A single commercial sector body, the Australian Spatial Information Industry Association facilitated by the Action Agenda and a consortium of spatial professional and scientific associations, the Spatial Sciences Institute (2001).
- A national research and development capability arising from public/private collaboration, the Cooperative Research Centre for Spatial Information (2003).
- A focus on engaging the national security and emergency management communities, the National Spatial Information Management Committee (2005).
- Development of national frameworks for property conveyancing systems, street address databases and elevation data sets (2006 to date).
- Promoting use of best practices, including enhancement of the ASDD, a harmonised data model, development of best practice guidelines for natural resource and local government data and support for implementation of ISO and OGC standards and specifications.

A set of goals, objectives and deliverables for implementation of the ASDI was set out in the ASDI Action Plan developed in 2003, which outlined a range of actions in five priority areas:

- Governance and partnership building
- Access to data
- Data quality
- Interoperability
- Integrability.

However, in the absence of strong signals for a national SDI, the current default ASDI strategy adopted by ANZLIC appears to be to link SDIs that are being established within each of the State and Territory government jurisdictions throughout Australia. This sub-national aggregation approach has an historical basis, as early jurisdiction-wide spatial data set development was for cadastral, transportation and topographic data collected by the individual States and Territories and national programs have tended to aggregate this data to meet their needs. It appears the expectation is that these SDI developments will reach out to the private and education sectors and the wider community and thus aggregate somehow to a national SDI.

Elements of this strategy rely on the data integration capabilities of PSMA; the data discovery and networking capacity of the ASDD; a national convergence of existing jurisdictional data access, pricing and licensing regimes; and the ability of ANZLIC to broker ongoing communication between government agencies through individual jurisdiction coordination arrangements. The reality is that while there have been ongoing communication and areas of cooperation between jurisdictions, each has proceeded with development of their own institutional, data policy, data collection and access mechanisms and it is not clear whether these can be aggregated to facilitate either a national spatial capability or access mechanism in their current form. Each jurisdiction has different business and policy priorities and so have generally taken different approaches to establishing their SDI's. While most focus on the traditional land management needs for spatial information, there is limited commonality in implementation directions.

There have been mixed results in attempts to encourage users to establish persuasive business cases to drive development of a national SDI. Enthusiasm has been invoked at operational levels within particular user communities such as emergency management, natural resource management, climate change and marine environment. The timing of these efforts has been driven by opportunistic responses to national policy priorities at various times. Each community has made some form of statement supporting the need for a comprehensive national SDI but invariably their efforts have fallen back to a series of projects aimed at meeting their individual short-term requirements.

However, the very act of promoting national use of spatial resources and highlighting problems such as data quality, interoperability and efficient data collection has had an invigorating effect on State and Territory SDI efforts. Jurisdictional coordinators have recognised that in the first instance, their SDI developments can benefit from the raised understanding of spatial data use engendered by these national promotional campaigns and they have been providing support for these efforts. This is not surprising given that in Australian federal arrangements, States and Territories have the chief responsibilities in the areas with potentially the highest use of spatial capabilities and these have been the communities that have been the focus for national promotional efforts. These areas include land administration, natural resource management and emergency services. Their needs are clear and apparent at individual jurisdiction level. Jurisdictional SDI may well meet these needs at this level.

What are not as apparent are the emphatic drivers for a national SDI to solve problems in and across these user communities. This explains that while user communities have been vocal in the need for a national approach (through a comprehensive SDI), little has come from it at national level. There has proved to be too little impetus provided by each community at a sufficiently high political level to get the concept of a national SDI accepted by the national government. A prime example is the continuing failure to get national agreement on a comprehensive framework for natural resource data and systems to underpin measurement, monitoring and reporting of Australia's conservation and use of its natural resources.

Part of the problem in establishing a national SDI arises from the existing investments that have been made at the jurisdictional level. While cross-jurisdictional agreement may be reached on a national approach, the actual implementation in each jurisdiction is unlikely since the cost is high as a consequence of modifying existing infrastructure while the benefit to each jurisdiction is relatively low.

Current efforts to develop national frameworks covering particular data themes or spatial capabilities build on the sub-national aggregation model. The development of these individual frameworks is driven by sectorial business needs in areas such as property conveyancing, street addressing and elevation data. Each framework individually addresses

particular user communities and each develops distinct governance, data collection priorities and data access arrangements. Implementation usually focuses on data integration, using techniques similar to the PSMA approach of aggregating sub-national capabilities.

National SDI efforts have recently been given new life by the emergence of the Australian Government focussing on priority national issues such as climate change, water, defence, social security, statistics and e-government and the recognition of the significance of spatial resources to inform policy development in each of these policy areas. The Australian government is looking at SDI-based responses to a number of the 'communities of interest', as found in the States and Territories. A major difference is the national perspective and the broader range of issues associated with developing capability with national coverage. Non-traditional drivers are also beginning to emerge and these appear to be developing greater traction than the drivers traditionally associated with the spatial sector. Key government priorities such as social inclusion are beginning to promote SDI thinking and may provide the much-needed political capital necessary to finally support an effective SDI effort, at least at the national level.

While such national activities are still likely to occur without an overarching policy framework supporting all jurisdictions, the emergence of a number of significant international spatial interoperability standards are removing many of the technical barriers to effectively linking individual, jurisdictional and sectorial SDI developments. However, Australia, like most countries, is still grappling with the political barriers to a single national SDI implementation.

In simple terms, the Australian Government's activities are simply a continuation of the present ad hoc approach in absence of an overarching comprehensive SDI approach. Using a standards compliant approach will enable a level of linkage to the SDI initiatives of other jurisdictions, but does not fill the vacuum of not having a national or at least Australian Government agreed policy/strategy.

Private sector providers through ASIBA have swung their support behind a comprehensive national SDI approach, although ASIBA is proposing large amounts of government investment. A recent economic study (ACIL 2008) has recommended that government should invest in an Australian Spatial Data Infrastructure and adopt nationally consistent standards and interoperability mechanisms. The establishment of such a national spatial data infrastructure where data collection, maintenance and delivery capabilities can be shared rather than duplicated will reduce existing waste. The infrastructure would provide considerable national benefit since there are many government (and commercial) activities that can be better served through common elements in a spatial infrastructure.

There are similar plans and proposals being considered by a number of jurisdictions, communities of interest and industry sectors. Little is known publicly about them, other than they are focussed on the specific needs of their own stakeholders and it is too early to speculate on what impact they may or may not have on development of a national SDI. Proposals include a national Environmental Information System and submissions to Infrastructure Australia for SDI funding. There is sufficient justification for a level of investment in creating a national SDI, but efforts to date have not generally reached a critical level of cost benefit. Improved collaboration between the communities of interest may assist in reaching the necessary political significance to establish a national SDI. However, traditional rivalries and a lack of recognition of the significant overlaps in requirements continue to hinder a more collaborative approach.

The economic stress currently facing Australia (and most other countries) may provide the forcing mechanism required for a pragmatic and less sectorial approach to establishing an SDI. As the national drivers increase in significance and the budgets decline, collaboration becomes a new (and cost effective) way of moving forward.

2. CONVERGENCE OR CACOPHONY?

2.1 What should constitute a national SDI

It is possible to build a comprehensive picture of the landform, seabed, built environment and impacts on the natural environment right across Australia's sovereignty to support national policy initiatives. The desires of sub-national aggregation and national framework building are positive forces towards a national SDI approach. Militating against is the lack of consensus, and hence unfocussed advocacy, about the form of a national SDI.

For some it is an integrated set of national data sets: the classic fundamental geodetic, cadastral, transportation, landform and land cover reference data which are being achieved through the efforts of PSMA and individual national frameworks. It could be argued that data providers mainly advocate this approach.

For some, especially system designers in the ICT industry, the SDI is seen as a systems architecture comprising core online services and data holdings interconnected through the web "cloud". This type of model is often found in jurisdictional SDI, enterprise level service architectures and e-government structures.

For others, particularly users, it is whatever is needed to provide ready access to spatial resources, whether data, information, services or spatial processes. Advocates point to the need for national governance arrangements; a policy overcoming access constraints such as transparent pricing and simplified licensing; interoperable capabilities; and adherence to common data standards. High-level government champions as well as agencies to lead implementation also need to be identified.

Further, peak bodies in the both public and private sectors of the spatial information industry advocate the need for underpinning initiatives such as skills formation and workforce planning; common investment strategies; higher levels of coordination to reduce duplication of effort; and development of national data access systems. A recent report (OSDM 2008) supported the need for such an approach, pointing out that improved national coordination when acquiring spatial capabilities and data could result in benefits including:

- Business efficiencies, more efficient and effective service delivery and improved policies can result from shared investment in significant spatial data acquisition programs.
- Increased investment in and focus on single authoritative sources for fundamental data types to provide more comprehensive and timely data to users.
- Provide more cogent signals to industry about investment opportunities in spatial technologies and acquisition of data to meet Australian Government needs, with consequential increase in capacity being created by industry to meet these needs.
- Provide considerable research and development opportunities for industry and academia resulting in the growth of the economy and improving Australia's knowledge capital.
- More cost efficient sharing of spatial data amongst levels of government driven by national policy requirements through existing national programs.

The report proposed that the national spatial data infrastructure would encompass the physical aspects of:

Administration

- Policy – implement the comprehensive whole of government spatial policy.
- Governance - provide high-level governance frameworks and strong leadership.

- Standards – provide a suitable standards-based framework for data harmonisation, quality control and access.

Technical

- Discovery and Access – provide easy access to high quality data and business processes with simple and ‘no’ cost channels using non-restrictive licensing mechanisms.
- Data and Information Networks – identify authoritative data sources.
- Enabling Technologies – support best practice use of technologies to enable the full end-to-end data cycle.
- Spatial Business Processes – facilitate shared spatial business processes.

2.2 Status of national frameworks

Considerable effort has gone into brokering and then developing national frameworks. The National Electronic Conveyancing (NECS) framework is perhaps the most advanced (see <http://www.necs.gov.au/>). It has the support of the State and Territory administrations and the legal and banking associations. NECS has a robust business case, negotiated service level agreements and a national governance structure oversighted by a steering committee comprising key stakeholders. The framework now comprises agreement amongst land registries for consistent business practices and common system requirements. It has commitment from the peak inter-governmental forum, the Council of Australian Governments (COAG). It appears to be a good example of a national need clearly enunciated and sought by affected stakeholders and ticks all the SDI boxes including governance, access, interoperability and standards-based development. It is proposed to have the system operational in 2010. However, NECS is clearly focussed on a single area of application and mimics existing capabilities found in land registries, albeit raising them to national level.

The development of a National Address Management Framework (NAMF) also has widespread support because street address is a key spatial reference used in many user applications. NAMF defines authoritative datasets to support physical addressing (position) and mail address for delivery, together with standard methodologies for address validation and geocoding. Finally, NAMF specifies a standards approach to the interchange of address data. A national geocoded address file (GNAF) has already been developed by PSMA as one of its integrated national data sets. It follows the aggregation model but it is also capable of matching with existing data holdings of national postal, electoral and social service agencies. However, the sustainability of a comprehensive national street address source requires ongoing engagement of stakeholders at all levels of government and relevant commercial interests to ensure that the best quality address data is captured at source and maintained as part of the national data set. PSMA has an existing and sophisticated engagement model that has proven to be successful in achieving this outcome. It requires the active participation of the national government and the eight States and Territories. Issues of governance, access, pricing, licensing, standards and interoperability have been resolved with G-NAF to address timeliness issues. PSMA is now establishing a more significant data management environment that aims to reduce the present 90-day update cycle of its existing data sets. This capability known as LYNX will provide direct linkages into jurisdictional level spatial data systems to reduce the timeframes for accessing jurisdictional data and supporting more automated quality control processes to significantly improve the update cycle. The ultimate aim is to establish close to real time updates of relevant data sets, especially G-NAF. However, there is still a gap in the update chain to local governments, who in most cases create addresses.

A recent proposal for a National Elevation Data Framework (NEDF) is meant to address the problem of developing a national high-resolution elevation data capability. The proposal is to develop a collaborative framework that can be used to increase the quality of elevation data

and derived products such as digital elevation models describing Australia's landform and seabed. The aim is to optimise investment in existing and future data collections and provide access to a wide range of digital elevation data and derived products to those who need them. The strategic imperative is how to optimise Australia's investment in elevation data and ensure this investment is directed at policy and operational needs at both national and local levels. It is about putting the "third dimension" on the national agenda (see <http://www.anzlic.org.au/nedf.html>).

The NEDF proposal is driven by increasing availability of improved satellite and aerial data providing wider coverage of higher-resolution data than derived from traditional mapping processes. A national series of workshops found strong support at all levels for a national framework approach to the "Shared Digital Representation of Australia's Landform and Seabed". This support led to promulgation of a user needs analysis, business plan, science case and implementation strategy in 2008. The proposal sets out the need for:

- A formal governance structure.
- A standards-based approach that facilitates integration of data from a variety of sources to meet a wider range of purposes and indicate fitness for purpose to potential users.
- Access arrangements that facilitate sharing and reuse of data and address issues such as licensing, security and liability.
- Consistent access mechanisms, such as web services that facilitate easy searching and access to data, including a robust authoritative metadata providing fitness for purpose.
- A national nested multi-resolution 'bare earth' land and marine elevation dataset.
- Processes to ensure that needs are assessed and prioritised and resources and systems are in place to ensure the data is collected to meet needs as they evolve in the long term.
- Virtual data repository and online portal with searchable data catalogue.
- Essentially free availability of elevation data.
- Vibrant elevation research and industry communities that contribute to GDP significantly beyond the level of Government investment and provide feed-back contributing to advancing both needs and solutions.

It is a classic SDI approach. In fact, the NEDF proposal has an unstated aim of engendering development of a comprehensive national SDI through demonstrating widespread support for this type of collaborative approach. It has certainly brought the need for an SDI into focus but as yet, while crystallising the need for elevation data as a fundamental data set, the process has not made clear how it can be extended to meet the more comprehensive needs across other data types and so has not advanced an overarching ASDI strategy.

This failure highlights the problematic nature of using various framework strategies that build into a comprehensive national SDI. Like the jurisdictional aggregation approach, each framework is clearly meeting a defined need for a particular consistency, but these individual frameworks do not necessarily converge into an ASDI.

2.3 Issues of policy and governance

The ASDI Action Plan published in 2003 pointed to barriers to the ASDI being:

- Immature institutional arrangements and user/ provider relationships
- Inconsistencies in the availability and quality of spatially referenced data
- Inconsistent policies concerning access to and use of spatially referenced data
- Incomplete knowledge about the availability and quality of existing spatially referenced data

- Lack of best practice in the utilisation of enabling technologies

A recent report (OSDM 2008) concluded that at national level, the current arrangements for the collection and management of fundamental spatial data are ad hoc in nature, lack a national focus and are characterised by little or poor coordination. No one Australian Government portfolio has responsibility because the information is a foundation knowledge base for a range of issues.

The present situation is that there are national peak bodies representing the various sectors of the spatial information industry (the providers), which have varied relationships with bodies representing user communities. To assist with coordination between the sectors participating in spatial activities in Australia a new group, the Australian Spatial Consortium (see <http://www.spatialconsortium.org.au/>) has been formed. The ASC comprises peak bodies and aims provide a cross-sector effort to improve access and use of spatial capabilities across the public, private and academic sectors of the spatial information industry in Australia. In its formative stage, it is not clear whether such an approach will be able to address the raft of governance and access issues in a way that is satisfactory to user communities.

2.4 Levels of capacity and interoperability

The web is an ideal networking medium for both suppliers and users to access and use spatial data and products. Designers have also found open web technology is a key for interoperability and ease of use. Web 1.0 provided a simple solution for map publishing; Web 2.0 has made possible a degree of interactivity and supports collaborative activities, which enables not only data but also service dissemination over the web. Key to this interactivity is use of the growing suite of WWW Consortium (W3C), International Standards Organisation (ISO) and Open Geospatial Consortium (OGC) standards and specifications. They provide the framework for spatial data interoperability across heterogeneous distributed systems.

This emerging Web2.0 environment enables users more flexibility to combine their data with others, to use external services and processes and to provide output through a range of devices to develop solutions tailored to their own or their clients needs. Mashups rather than supplier specified products. This user-led need for flexibility will drive spatial data usage in future.

In 2005, the Spatial Interoperability Demonstration Project or SIDP (see www.anzlic.org.au/get/2413334959.ppt) was sponsored by the private sector through ASIBA and supported by public and private sector contributions, promoted the potential benefits and ease of implementation of interoperable standards by individual enterprises. The project used various disaster response scenarios and took the solution “on the road” around Australia. While it raised understanding and enthusiasm, leading to adoption of interoperability in several enterprises, it could not be sustained without clear national leadership and a more comprehensive standards adoption policy.

New proposals for revitalising SDI development, building on business models established in other sectors and utilising the significant technical advances in the Internet, geospatial standards and ICT technologies in general, are now emerging. ANZLIC is investigating a new paradigm for SDI creation that could take the form of a spatial resource market place, building on both public and private capabilities and more aligned to Web2.0 methodologies than the current SDI approaches with their more static and Web1.0 functionality. As part of this re-thinking ANZLIC is aiming to call this initiative the Australia New Zealand Spatial Infrastructure (labelled ANZsi) to reflect the interests of both Australian and New Zealand national governments.

However, at this point, there is still no national policy or infrastructure to adopt use of international spatial interoperability standards in Australia that would encourage use of interoperable capabilities. While there has been some convergence on use of agreed standards a national commitment to use these standards is not formalised and has not been placed in a national policy context in a way that clearly supports a national SDI. There is no model as yet that clearly states what level of interoperability is required to aggregate jurisdictional SDI or national frameworks into a seamless and sustainable infrastructure.

Spatial data access and pricing, a cornerstone of an SDI provides a case study. A national review of State and Territory spatial data access and pricing policies (GA 2006) concluded that the current situation with access and pricing policies developed by State/Territory governments and PSMA is marked by some commonality in principle but significant differences in detail. Common principles include the desire to encourage use of spatial information, protect intellectual property rights and privacy and maintain a level of investment in spatial data holdings to keep pace with user demands for accuracy, currency and availability. There are significant differences between and within every jurisdiction in both interpretation and practice of access conditions and data pricing. For example, a casual user would find it difficult to find specific access limitations and data pricing from a scan of many government websites. Even finding a potential data source through the ASDD requires a manual enquiry to ascertain access and pricing requirements.

2.5 Conclusions

The current situation influencing the development of a national SDI is characterised by:

- The informal “four pillar” institution policy that has seen the emergence of four key national coordinating bodies in covering the public sector (ANZLIC), the commercial sector (ASIBA), the practitioners (SSI) and the research and academic sector (CRCSI) that are recognised as representing the spatial information industry in Australia.
- The “eight laboratories” of SDI development, being the SDI or equivalent programs in the States and Territories.
- A number of national spatial data frameworks, based on property, address and elevation data transactions, with PSMA aggregating and integrating some of the fundamental national data sets using jurisdictional data and private sector resources.
- Emergence of large international commercial companies providing access to spatial capabilities including online map data, GPS and remote sensing sources, such as Google, Microsoft, Nokia and others.

Rapid advances in technologies are driving improvements in many areas of government and are also raising the expectations of business and the public for better government outcomes and service delivery utilising technology. Expectations in the broad community have changed considerably as a result of technological advances. The introduction of Google Earth, in-car navigation and hand-held global positioning systems are making location based service commonplace. Online services now include maps and other location information such as the Telstra ‘Where’s’ service and Google Earth adding value to many commercial web sites. Why cannot Australian business and government agencies provide more flexible and integrated services using spatial resources that will significantly benefit the Australian community?

The ability of users to discover and access spatial data is still problematic. The problem of discovering existing data that is suitable to a particular purpose is difficult because of the sheer magnitude of existing spatial data sets held by many agencies at three levels of government, private companies and academic and research institutions. For example, the recent UK Location Strategy pointed out that on average, users spend 80% of their time

trying to find, access and get spatial data into an application, while only about 20% of time goes into real analysis. Australia is not alone in having the problem, but obviously has a long way to go in meeting ubiquitous needs for spatial capabilities.

One view of the current situation regarding a national SDI is shown in the following table.

Table 1: Current Situation in Australia

SDI Component	Current situation	Yet to be achieved
Policy	Various jurisdictional spatial data policies	National policy setting out agreement on access, licensing and pricing
Governance	Multi-sector coordination mechanisms in most jurisdictions; multitude of sector-based peak bodies interacting with user community bodies at national level; proposal for cross-sector spatial consortium	Formal national cross-sector agreement, rolled out through engagement with user communities
Standards	Informal acceptance of international best practices at enterprise level; addressed in some jurisdictional coordination arrangements; standards implemented mainly through use of commercial products	Formal adoption and means of monitoring implementation
Discovery and access	The ASDD catalogue with 40,000 entries, albeit many out of date; jurisdictional access portals under development; multitude of individual agency and enterprise websites; simplified access through individual national frameworks	Easy discovery of high quality data and business services with simple and 'no' cost access channels using non-restrictive licensing mechanisms; use of common licencing regimes including on line and machine to machine licence transactions.
Data and information networks	Held at agency and enterprise level; means to create national data sets, eg PSMA integrated data sets; national harmonised data model available	More national high resolution data sets; agreed national strategy to prioritise gap filling to meet known user needs; mechanism to identify and promote authoritative data.
Enabling technologies	Growing use of enterprise-oriented architectures; still diversity of stove-pipe solutions at agency level; increased convergence in spatial technologies; new display options through web-based mash-ups	Jurisdictions and private sector access to spatial resources and wide spread use of these resources as a common commodity available through a wide range of devices; at enterprise level use of best practices in take up and use of new spatial technologies.
Spatial business processes	Few integrated processes across agency and enterprise boundaries; jurisdictional e-government initiatives attempting to create end-to-end processes and improve service delivery; spatial consortium proposal to address national needs	Mechanism to facilitate shared spatial business processes

There still needs to be work done to create an overarching governance arrangement. Also the existing and planned sectorial and jurisdictional efforts need a national framework to assist their convergence to establish the ASDI or something similar.

3. ARE WE THERE YET?

3.1 National priorities and needs

The Australian Government elected in 2007 outlined an ambitious agenda of change and reform. There is a strong focus on economic prosperity, with the aim of building long term sustainable prosperity by investing in people, technology and infrastructure. The Government's policy outcomes include:

- A "joined up" solution, to tackle issues such as social inclusion;
- Reform of Federal-State relations;
- Planning for and mitigating the effects of climate change and water shortages;
- Safety and sustainability of local communities;
- Developing skills and innovation in the digital economy and becoming globally competitive.

These particular issues have been selected, not just because the Government has given them high priority, but also because they all have a 'location' component and can be better enabled by use of spatial information. All governments in Australia are enjoined in these national policy initiatives. It is important to recognise that all States, Territories and local governments hold spatial information that is crucial to national policy implementation and local service delivery. Therefore, part of a federal reform agenda must be to improve information sharing with the national government and bring the wealth of spatial data held by all governments to bear on achieving national outcomes and the ability to deliver benefits right down to local level. One mechanism aimed at providing a high level framework that could support the spatial community is the National Government Information Sharing Strategy (NGISS), a program established by COAG's Online and Communications Council. NGISS aims to "unlock government information assets to the benefit of the broader community". Spatial resources should be seen as an important subset of these information assets.

The power of using spatial resources has already been demonstrated in areas such as natural resource management, land administration, disaster prevention and management, asset management, transport and navigation. It is finding new applications in areas such as environmental monitoring, water management, measuring and mitigating climate change, administration of justice, human and animal health and social inclusion. [OSDM 2008]

A coordinated approach within the Australian Government could lower compliance and supply costs of jurisdictions servicing national requirements. High costs are resulting from a number of inefficiencies such as multiple requests for similar data in different forms from Australian Government agencies. The States and Territories have often expressed support for national SDI approach, but have been unwilling to expend their resources without a clear policy (and funding) lead from the national government.

Developing an all-encompassing national access and pricing policy covering all jurisdictions has proved elusive. A national agreement is needed, endorsed by COAG as a policy, establishing principles to simplify access for users, reduce cost of access and use and improve transparency of conditions and price that provide benefit in key areas of the national economy. It also requires recognition of the need to operationalise national agreement by developing a spatial data infrastructure to improve transactional efficiencies (OSDM 2008). Additionally, it is not possible to consider spatial infrastructures without considering the commercial sector as both suppliers and consumers of spatial resources. Any national framework must include both private and public sectors and possibly take the form of a spatial marketplace. Cost is only one of many barriers to access spatial resources and market forces together with government support will determine costs of access. The main barriers continue to be discoverability and access (such as simple licences). These barriers

need to be resolved through a nationally agreed framework and once defined should result in a rapid growth of a spatial marketplace.

3.2 Market failure

There is a need to resist the impulse to micro-manage all aspects of spatial data collection, management and use across government. The provision of services to users should be left to the marketplace. However, there appears to be a case (see ACIL 2008, OSDM 2008) to address problems of failure of the market to deliver effective and efficient access to spatial capabilities needed across jurisdictions, market sectors and communities of practice. These failures include lack of discoverability of existing data and services, clarity in data quality, transparency in data pricing and complex data licensing arrangements.

As most existing spatial data is held by agencies at the three levels of government, an important factor influencing access and use of data is the policies of government jurisdictions, and the practice of public agencies, in setting conditions and prices for access to the data they control (SEAG 2008). Focus should be on a framework that invests in use of spatial resources nationally and provides incentives for collaboration to achieve national outcomes.

3.3 Some suggested goals

The challenge is for users to discover, access and use spatial resources. For government users this will improve decision-making, business outcomes and customer services (SEAG 2008). Commercial users can reduce costs, improve services and develop innovative solutions, while the research community will benefit through easier access to spatial resources that will help progress their research activities. If most users are spending five times longer to discover, access and apply spatial data than to use it, a worthwhile goal is to reverse this dynamic.

Some desirable goals for a national SDI are:

- Improved business efficiencies, more efficient and effective service delivery and improved policies can result from shared investment in significant spatial data acquisition programs.
- Increased investment in and focus on single authoritative sources for fundamental data types to provide more comprehensive and timely data to users.
- Provide more cogent signals to industry about investment opportunities in spatial technologies and acquisition of data to meet Australian Government needs, with consequential increase in capacity being created by industry to meet these needs.
- Provide considerable research and development opportunities for industry and academia resulting in the growth of the economy and improving Australia's knowledge capital.
- More cost efficient sharing of spatial data amongst levels of government driven by national policy requirements through existing national programs.

A national objective should be to reach a point:

- Where fundamental location information is a common good available to citizens and businesses to encourage creativity and product development; and
- Where governments use place as a means of organising their activities and their information and joining up business processes and community services.

3.4 What needs to be done?

Given the perceived lack of a strong business case for the national government to fund a national spatial data infrastructure itself, a productive role for it would be to develop the policy settings and programs that create an environment conducive for others to do it. This means a comprehensive spatial policy aimed at: incentives for State/Territory SDI aggregation; measures to reduce duplication and transactional inefficiency amongst agencies and between jurisdictions; and removal of barriers to innovative use of public spatial assets by both public agencies and private enterprises to provide elements of the infrastructure and value-adding services using that infrastructure.

Both suppliers and users of spatial data have advocated the need for better coordination of effort within and between governments for some time. All existing coordination activities across many communities of practice revolve around common issues of governance, institutional structures, interoperability and access. What is missing is a national spatial policy framework that allows these issues to be resolved (SEAG 2008).

A national spatial policy, reached through agreement and promulgated by COAG, should at a minimum:

- Mandate access to (and the sharing of) spatial data – make restrictions on access the exception, not the norm.
- Establish a framework to access from and supply data to States and Territories, supporting the National Government Information Sharing Strategy.
- Establish authoritative data and spatially enabled business process sources and identify custodian agencies,
- Enforce adherence to agreed spatial and interoperability standards within government in all relevant ICT projects,
- Encourage and facilitate further growth of the Australian spatial industry and related academic community.
- Leverage spatial capabilities for the betterment of the Australian government, the public and the private sector, supporting greater efficiency in government business activities including service delivery and policy development and evaluation and through enabling economic growth.
- Provide whole of government cost/benefit, not simply focus on cost/benefit to the implementing agency.

Further, to ensure implementation of such a policy, a governance mechanism should:

- Engage key decision makers right along the supply chain from providers to users.
- Provide strong leadership at all levels.
- Support the implementation of the spatial data infrastructure to meet government outcomes and broad community interests.
- Effectively integrate the spatial activities of the Australian Government, the States and Territories, the commercial sector, research and academia.

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