



Delivering a Linked, Spatially-Enabled Australian Information Infrastructure

Workshop Outcomes Report

6 November 2012



Australian Government

**Department of Resources,
Energy and Tourism**

Office of Spatial Policy

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- The end user is the person wishing to use/analyse the data and may not be the staff GIS operator; and
- Information products should be delivered as and when they are required.

The Vision specifically encompasses all Government information, with location being the key linking element.

Workshop delegates confirmed the Government’s position that its role in establishing such an Infrastructure becomes less imperative higher up in the 'value chain'. Especially in a context of budget constraints, Government should focus on providing a framework of fundamentals, enabling cultural change and removing boundaries for innovation.

The key principles guiding this process are:

- Leverage existing work, emphasising re-usability (Adopt, Adapt, Invent);
- Avoid technical lock-in; adopt a flexible, agile approach that allows for rapid (technical) evolution and innovation; and
- Adopt and work with Open Government and Open Data principles, both in Australia and Internationally. E.g. cherry-pick from other international programs.

1.3 Barriers & Solutions

In identifying the barriers to implementation, delegates’ consensus was that on the whole, technology is no longer a real impediment.

The key barriers and associated solutions are in summary:

Barrier	Solutions
A culture of risk aversion that inhibits data sharing	Building upon OAIC principles ¹ Education and Awareness Guidance and best-practice examples
Framework data mostly exists already, but in different forms, across different organisations, often duplicated across application domains	Harmonisation of framework data in a federated model Making framework data more freely available Reviewing PSMA licensing and pricing model
Most content is not owned by the Commonwealth, but by jurisdictions, and is accessed on agency-by-agency basis	Whole of government, cross-jurisdictional access & licensing approach Any policies will need to have ‘teeth’

¹ http://www.oaic.gov.au/infopolicy-portal/reports_infopolicy.html#PSI_principles

1.4 Practical Next Steps

The table below summarises the key suggestions from the delegates:

Activity	Timeframe	Responsible
Negotiate a whole of government license agreement for PSMA Australia's (PSMA) GNAF and Admin Boundaries products in the first instance and work to make as many jurisdictional data sets openly available over time.	0-6 Months	OSP, APS 200, PSMA
Develop location information strategic framework that: <ul style="list-style-type: none"> - is integrated and consistent with other Commonwealth, state and territories information management policies and principles; - will underpin the development of a National Spatial Information Infrastructure; - clarifies responsibilities; - defines best practice guidelines; and - includes senior executive 'approval to publish' mandate 	Commencing Draft to ANZLIC by November 15 and presentation of proposed framework at Spatial@Gov	OSP, OAIC, ANZLIC
Develop or accelerate a demonstration and/or exemplar projects that provide: <ul style="list-style-type: none"> - Acceptable/good data sharing practices and processes - Best practice technology and architectures - Best practice and 'how-to' guidelines 	12 months	OSP, GA, CRC-SI, NEII, NCRIS Project, and ANZLIC Members

1.5 Conclusions

At the Workshop there was widespread recognition that change was required and that the time seemed right with a revived agenda for a National Spatial Information Infrastructure. The workshop helped to build a consensus and mandate for OSP to lead that change.

Technology is not a barrier to establishing an National Spatial Information Infrastructure; but current governance, culture and access constraints are.

The workshop identified some initial key solutions and practical next steps that can be executed in the immediate future to establish the type of information infrastructure that has been talked about for so long.

2 Introduction

2.1 Background & Objectives

Australian governments have been talking about establishing an Australian Spatial Data Infrastructure (ASDI) for over 20 years, with disappointingly few outcomes. Yet, the timely access to useful information products continues to be raised as one of the key issues driving efficiency of government and improved service delivery. The pressing need for a well-functioning government information infrastructure is undisputed, and location is the glue that brings together information products from a wide and diverse range of domains.

Currently the Australian Government is investing in excess of \$900 Million dollars until 2013 in research infrastructure and programs under the Super Science Initiative². These well-funded Projects are delivering an excellent research architecture and infrastructure for use by the targeted research-users but many of these projects have a time-limited funding stream and no current plans for either commercialisation or transition to mainstream government business. This means that there are limited opportunities to capture the innovation, knowledge or data, or indeed to quantify the return on investment of these programs. For many research projects when the project funding runs out, the data gathered and the underpinning infrastructures built at great cost to Government are often lost.

For those involved in the current work to establish a National Spatial Information Infrastructure (NSII) there is a strong desire to leverage the world leading research and engineering efforts achieved in the NCRIS projects. The aim is to create a sustainable information framework that rises across and beyond the individual e-research projects, and forms some of the foundations of an NSII.

On Wednesday 22 and Thursday 23 August 2012, the Department of Resources, Energy and Tourism (RET), Office of Spatial Policy (OSP), in collaboration with the Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE) and the Bureau of Meteorology (BoM), co-hosted a workshop on "Delivering a linked, spatially enabled, Australian information infrastructure".

The workshop sought to bring together a range of research, e-research and other major funded Government projects to discuss the options for greater coordination and collaboration across project boundaries. The focus was on how research projects might be transitioned into identified mainstream Government Programs, through end of life, and how the Australian Government can make best use of the world-leading research and engineering efforts, outcomes and infrastructure developments, across multiple, finite, yet well-funded, projects.

The workshop addressed key issues such as: what are the barriers to shared infrastructure development, what would be needed to break them down, and what concrete steps can be taken for this to be achieved in the short, medium and long term?

This document is a summary of the Workshop and its main outcomes.

Section 3 recaps the first day, which covered scene setting, presentation of the exemplar linkage networks, and the presentation and validation of the Vision.

Section 4 provides a summary and synthesis of the second day working sessions, and sums up the main linkage opportunities and barriers. It closes with recommended practical steps for moving forward on the aspects of governance, technology and communication.

² <http://www.innovation.gov.au/Science/ResearchInfrastructure/Pages/SuperScience.aspx>

A full list of attendees and detailed outcomes from the working groups are provided in the appendices, as well as a Prospectus from the Bureau of Meteorology, outlining opportunities for collaboration in the National Environmental Information Infrastructure (NEII).

2.2 Workshop Agenda

Day 1 – Wednesday 22 August

Time	Item
08:30	COFFEE & REGISTRATION
09:00	Opening and Welcome – Helen Owens (General Manager, OSP)
09:05	Keynote Address – Senator the Hon. Kate Lundy
09:25	Introduction and Workshop Logistics – The Hon. Gary Nairn (Facilitator)
09:40	Background and Objectives – Helen Owens
09:55	Bureau of Meteorology Perspective – Rob Vertessy (A/g Director, BoM)
10:10	The Role of the Department of Innovation, Industry, Science, Research and Tertiary Education – Clare McLaughlin (General Manager, Research Infrastructure Branch, DIISRTE)
10:25	MORNING TEA
10:55	NCRIS-related and Other Relevant Projects (5 minutes per presentation):
	National Environmental Information Infrastructure (NEII) Dr Andrew Woolf , Head, Architecture Section, Climate and Water IT Services, Bureau of Meteorology
	Australian Urban Research Infrastructure Network (AURIN) Professor Richard Sinnott , Project Consultant, AURIN
	Terrestrial Ecosystem Research Network (TERN) Craig Walker , EcoInformatics Coordinator, University of Adelaide
	AuScope Dr Rob Woodcock , CSIRO
	Australian Biosecurity Intelligence Network (ABIN) Dr Joanne Banyer , Chief Executive Officer, ABIN
	Atlas of Living Australia (ALA) Lee Belbin , Team Leader, Spatial Data Management, ALA
	Integrated Marine Observing System (IMOS) Dr Roger Proctor , Director IMOS, University of Tasmania
	Australian National Data Service (ANDS) Ross Wilkinson , Executive Director, ANDS
	Project Darwin Dale Percival , ICT Architect, Geoscience Australia
Defence Geospatial Domain Kevin Rosenbaum , Geospatial Innovation Centre, Department of Defence	
11:55	Infrastructure Analytics – Hugh Durrant-Whyte (CEO, NICTA)
12:15	LUNCH
13:15	An Australian Information Infrastructure: what could it look like? – Helen Owens
13:30	Working Groups #1 – VALIDATING A VISION FOR 2020
14:30	Afternoon Tea
15:00	Reporting Back – Group Reporters
15:40	Discussion – facilitated by Gary Nairn
16:10	Summary and Close – Gary Nairn
16:20	END DAY

Day 2 – Thursday 23 August

Time	Item
09:00	Opening Address – Drew Clarke , Secretary, Department of Resources, Energy and Tourism
09:30	Summary of Day One – Gary Nairn
09:45	Working Groups #2 – BARRIERS & SOLUTIONS
10:45	MORNING TEA
11:15	Reporting Back – Group Reporters
11:55	Discussion – facilitated by Gary Nairn
12:15	LUNCH
13:15	Working Groups #3 – PRACTICAL NEXT STEPS
14:15	Reporting Back – Group Reporters
14:55	AFTERNOON TEA
15:25	Discussion – facilitated by Gary Nairn
15:45	Summary and Close – Gary Nairn & Helen Owens
15:55	END DAY TWO

3 Day 1 – Wednesday 22 August

3.1 Keynotes³

The workshop was formally opened by **Senator the Honourable Kate Lundy**, who recognised that the Workshop represented the commencement of a very important, well overdue dialogue. Senator Lundy pledged, together with Minister Ferguson, “to provide whatever support I can to make the outcomes of the workshop come to life”. She also reinforced what was going to be one of the leading workshop themes, that “... technology is no longer a showstopper [...]. The issues we face are more to do with people, culture, existing norms, and turf protection”.

OSP General Manager, **Helen Owens** then presented the workshop background and objectives. She reminded us that government has been talking for more than 20 years about Spatial Data Infrastructures, and yet a national spatial capability remained a significant challenge to deliver. But with the establishment of OSP there is a window of opportunity to link location information with an overall, Australian linked information infrastructure. The division between these two fundamental concepts is rightly blurring, and the time is right to start achieving some results.

Rob Vertessy, Acting Director of the Bureau of Meteorology, then spoke on the role of spatial information in providing “Environmental Intelligence”, and the need for ongoing, sustainable information supply through a (spatial) information infrastructure. The task at hand is big, we cannot deliver everything in one go, so it’s imperative to define clear, specific goals and associated actions.

Clare McLaughlin, General Manager, Research Infrastructure Branch, DIISRTE, then presented the viewpoint from her Department’s perspective, notably the NCRIS coordination role that her Branch has responsibility for. She confirmed the view that the NCRIS projects have a lot of potentially useful data and infrastructure to contribute to a broader Australian Government information environment, and that data produced from research should benefit the whole-of-government. She noted however that NCRIS research infrastructure was purpose designed and created to serve the research community and is therefore owned by the research community. Consequently it cannot be easily transitioned to Government needs. Following its creation for research purposes, such data may well need to be federated and/or collated into a new format, fit for use by Government decision making processes.

NICTA CEO **Hugh Durrant-Whyte** then presented NICTA’s work on Smart Infrastructure and how sensor enablement can dramatically improve efficiency and productivity in all industries and business.

3.2 Project Presentations

The second part of the “scene setting” was for the NCRIS-related and other relevant projects to present the information sharing aspects of their projects, as relevant for this workshop. The questions covered in their presentations were:

- What does your project’s Information Sharing Architecture look like?
- Why was this Information Sharing Architecture chosen?
- What worked well, and what would you do differently?

Ten projects presented:

- National Environmental Information Infrastructure (NEII) *Dr Andrew Woolf, Head, Architecture Section, Climate and Water IT Services, Bureau of Meteorology*

³ Workshop presentation slides are available on the OSP website:

<http://spatial.gov.au/resources/workshops>

- Australian Urban Research Infrastructure Network (AURIN) *Professor Richard Sinnott, Project Consultant, AURIN*
- Terrestrial Ecosystem Research Network (TERN) *Craig Walker, EcoInformatics Coordinator, University of Adelaide*
- AuScope *Dr Rob Woodcock, CSIRO*
- Australian Biosecurity Intelligence Network (ABIN) *Dr Joanne Banyer, Chief Executive Officer, ABIN*
- Atlas of Living Australia (ALA) *Lee Belbin, Team Leader, Spatial Data Management, ALA*
- Integrated Marine Observing System (IMOS) *Dr Roger Proctor, Director IMOS, University of Tasmania*
- Australian National Data Service (ANDS) *Ross Wilkinson, Executive Director, ANDS*
- Project Darwin *Dale Percival, ICT Architect, Geoscience Australia*
- Defence Geospatial Domain *Kevin Rosenbaum, Geospatial Innovation Centre, Department of Defence*

Though the projects obviously have different objectives and application domains, it was clear after the presentations that there are many similarities and duplications in the type of information management and architectural issues they had to solve. There is undoubtedly a wealth of knowledge and IP developed within these “Cylinders of Excellence” (Robert Woodcock CSIRO). This, combined with the fact that most of the projects have a finite lifetime, strengthens the case to identify the elements that can be leveraged in the development of an enduring and sustainable information infrastructure.

3.3 A National Spatial Information Infrastructure: what could it look like?

In the final scene setting presentation, **Helen Owens** presented OSP’s Vision for a National Spatial Information Infrastructure; a vision to be validated, and contributed to, by the workshop participants.

This presentation also introduced some pertinent questions to be addressed in the workshop, such as:

- What is the role of government in a National Spatial Information Infrastructure?
- What are the relevant use-cases?
- Are there any prioritised application domains?
- What should be the guiding principles in developing this Infrastructure?
- What are the essential building blocks, and which of those are already in place?

The Australian Government’s Strategic Location Information Framework Vision is:

“That Australian Government information is linked to a location, improving decision making and service delivery, and increasing innovation and productivity”

Fundamentally, it’s about establishing an Infrastructure that delivers the **right information** to the **right people** in the **right time**. Noting that:

- Different users have different requirements and hence need different information products in different forms;
- The end user is the person wishing to use/analyse the data and may not be the staff GIS operator; and
- Information products should be delivered as and when they are required.

Any infrastructure that is developed will therefore need to pass the following criteria: the Infrastructure must be able to deliver:

- the right information – information products that are fit for purpose;
- to the right people – the real end user which, in the future, is just as likely to be a machine, as a person; and
- in the right time? – discovery, access and use occurring in a timeframe that suits the end users purposes”.

3.3.1 Validating the Vision

Participants then worked in six groups to validate the Vision, and address a number of specific issues. Collated group reports are available in Appendix 2 – Group Work.

Future Infrastructure

There was general consensus and agreement on the Vision as presented. The main suggestions were to add "Cultural Aspects" and that any future infrastructure needs to have a strong conceptual separation between the application- and information layers in the technical stack. There was also a consensus for a greater focus on ensuring re-usability and standardisation in order to support interoperability between systems.

The role of Government in establishing an information sharing infrastructure

The workshop participants were asked to comment on the perceived scope of Government activities in achieving the Vision.

Though nothing was considered totally out of scope for Government, the consensus was that the Government role becomes less imperative higher up in the information 'value chain'. The role of government in the provision of information infrastructure and delivery mechanisms depends on the maturity of the information industry and markets. Where the market is mature the role of government may be limited to primary data supply or acquisition or highly complex infrastructure e.g. investment in satellite receiving stations or high performance computing. Only where there is a demonstrable 'public good' case, should the government be involved in all steps of the data gathering to information value chain. Weather forecasting is a good example of the latter.

Aspects "in scope" then include:

- Policy & Regulations;
- Centre of Excellence;
- Trusted provider of authoritative data and information; and
- Enabler of Innovation.

Roles that government should be hesitant to fulfil:

- Application developer;
- Commercial content provider; and
- Innovator.

Guiding Principles

A large number of principles were suggested, which can be summarised as:

- Leverage existing work, emphasising re-usability and standardisation (Adopt, Adapt, Invent);

- Avoid technical lock-in; adopt a flexible, agile approach that allows for rapid (technical) evolution and innovation; and
- Adopt and work with Open Government and Open Data principles, both in Australia and Internationally. E.g. cherry-pick from other international programs.

4 Day 2 – Thursday 23 August

On day 2, the workshop participants were asked to define barriers in achieving the Vision, and suggest solutions on how they might be overcome. Also, they were asked to propose concrete actions to be taken as next steps. The main barriers, solutions and actions are listed below, a full overview of responses is available in Appendix 2 – Group Work.

4.1 Opening Keynote: Drew Clarke

The opening of day two was provided by **Drew Clarke**, the Secretary of the Department of Resources, Energy and Tourism (RET).

Drew reinforced his Department’s view that ‘spatial’ is part of broader information economy, and that the potential of spatial information in Australia is not harnessed to its full potential. Furthermore, in his view the focus of the government should be in unlocking and enabling information not in building applications. This means government should focus on:

- Research and Development – the CRC-SI play a critical role in this;
- The provision of framework datasets; and
- Defining the associated standards and policies that make an infrastructure work.

In this context, he is yet to be convinced there is a role for government beyond that, notably in the building of specific whole-of-government applications.

He also acknowledged the Commonwealth’s focus is on creating a single arrangement for whole-of-government access to key datasets such as G-NAF.

4.2 Barriers and Solutions

Groups were asked to address the following question:

“What are the key barriers to achieving the Vision, and how can they be overcome?”, grouped by: Governance & Policy, Content, Technology & Standards, and People.

The table below summarises the key suggestions from the delegates:

	Barriers	How to Overcome
1. Governance and Policy	Most content is not owned by the Commonwealth, but by jurisdictions, and is accessed on an agency-by-agency basis or through PSMA Australia.	Strive towards a whole of government, cross-jurisdictional access & licensing approach for a defined set of foundation data sets. Any Policy will need "Teeth" but let's at least get some national policies in place for the foundation data themes.
	Culture of risk aversion inhibits data sharing.	National policies and regulatory framework, need to be consistent with OAIC principles ⁴ . Guidance and best practice examples can provide better assurance and break down risk aversion.

⁴ http://www.oaic.gov.au/infopolicy-portal/reports_infopolicy.html#PSI_principles

	Barriers	How to Overcome
		Report and showcase examples of quantified benefits to determine ROI.
2. Content	Foundation data mostly exists already, but in different forms, across different organisations and jurisdictions, often duplicated across application domains.	<p>Harmonisation, particularly of foundation datasets.</p> <p>Moving from aggregated (e.g. PSMA) model to federated model (e.g. WDTF/AWRIS, AuScope, ABIN, NEII) for thematic data while keeping foundation data at the aggregated level.</p> <p>Focus on unique (authoritative) identifiers (ie. Linked Data approach), not just geometry.</p> <p>Development of domain standards and information models and registers.</p>
	PSMA licensing and pricing model can be an impediment to innovation and wide take-up of location data.	Consolidation of PSMA licensing and enabling wider access to data sets would stimulate use.
3. Technology and Standards	In general terms, technology and standards are not barriers any more.	Taking an agile Approach.
	Specifically, some impediments remain, such as: Wide range of technologies and standards are available and are rapidly evolving making it difficult for agencies to keep up and understand best practice.	<p>Developing Policies that mandate technology & standard principles only.</p> <p>Base architectures on those principles, but don't prescribe technical specifics (e.g. learn from INSPIRE⁵).</p>
4. People	Cultural barriers.	Awareness & training.
	Shortage of specialist technical skills, especially in government.	Keep the work interesting and join the efforts of relevant bodies to take a national approach to strategies for skill shortages.

⁵ <http://inspire.jrc.ec.europa.eu/index.cfm/pageid/48>

4.3 Practical Next Steps

Groups were asked to address the following question:

“What practical steps can be taken, and by whom, to work towards identified solutions? Prioritise”.

The table below summarises the key suggestions from the delegates:

Activity	Priority (H/M/L)	Timeframe	Responsible
Make jurisdictional data more widely available	H	0-6 Months	OSP, APS 200, PSMA
Conduct Risk/Benefit analysis of making location information (or framework datasets) freely available, with quantified benefits to identified government functions and services	H	6 months	OSP, OAIC
Develop location information strategic framework that: - is integrated and consistent with other Commonwealth, state and territories information management policies and principles; - will underpin the development of a National Spatial Information Infrastructure; - clarifies responsibilities; - defines best practice guidelines; and - includes senior executive 'approval to publish' mandate	H	Draft to ANZLIC by 15 November 2012 and presentation of proposed framework at Spatial@Gov	OSP, OAIC, ANZLIC
Develop or accelerate a demonstration and/or exemplar projects that provide: - Acceptable/good data sharing practices and processes - Best practice technology and architectures - Best practice and 'how-to' guidelines	H	12 months	OSP, GA, CRC-SI, NEII, NCRIS Project, and ANZLIC Members

Both during the workshop, and in post-workshop correspondence, many organisations offered to collaborate with OSP in delivering these next steps. A ‘coalition of the willing’ seems to be forming rapidly. NICTA and the CRC-SI have an interest in identifying architectural commonalities and alignment between jurisdictions (including NZ) to define what common effort can be re-used.

The CSIRO offered to share lessons learned from the Atlas of Living Australia as a proof of concept demonstrator. Geoscience Australia’s work on the National Elevation Data Framework (NEDF) and the establishment of an imagery source on the ANU Super Science Infrastructure would be a big step towards delivering a two of the national foundation datasets. ABIN has offered the use of its online collaboration infrastructure as a practical tool for communities of practice to collaborate online. And finally, the Bureau of Meteorology re-iterated its open invitation to participants to help assess the design, implementation and testing of the National Environmental Information Infrastructure. More detail on how to collaborate with the NEII can be found in Appendix 3 – NEII *Prospectus*.

4.4 Roadblocks to Success

At the end of the second day, **Helen Owens** presented Roadblocks to Progress that had been identified, and **suggested** recommendations to overcome them. Note: Some of these recommendations are outside the scope of the work of OSP.

- 1. Highly restrictive licensing, access and pricing models for key jurisdictional data sets;**

Recommendation 1: make key jurisdictional data sets, starting with the G-NAF® more widely available across Government.

2. The absence of a single point of national leadership for a SDI development in Australia;

Recommendation 2: establish a Commonwealth single point of national SDI leadership, comprising government, industry, and research / innovation staff, which will design, implement and monitor the standards, protocols, business rules and business architecture guidelines for a National Spatial Information Infrastructure.

3. Leading edge, but stove-piped and often duplicated, information infrastructures being developed without long term plans for the realisation of a return on investment or a whole-of-government approach

Recommendation 3: transform the conduct of information infrastructure projects, both internal agency proposals and external agency funded proposals, by requiring information infrastructure proposals/ submissions detail the Project's:

- (1) long-term data management, curator and transition plan;
- (2) data access, licensing and distribution plan;
- (3) migration strategy for transitioning project outcomes into programs within industry, research institutions, government and / or the community; and
- (4) use of appropriate international open standards in support of interoperability.

Recommendation 3.1: investigate the most appropriate ways to leverage existing research projects where funding is coming to an end and migrate these infrastructures into current operational environments.

4. The lack of an identified specific funding stream for the creation and sustainment of national spatial data sets and supporting infrastructure.

Recommendation 4: identify funding for the creation and sustainment of the critical national framework data themes identified by ANZLIC (Appendix C).

Recommendation 4.1: build Australia's capacity and capability in multi-spectral high resolution imagery (50 cm) and high resolution national digital elevation models to support effective emergency management by installing a virtual ground terminal and work with industry on a national collection program at the least possible cost to all jurisdictions.

Appendix 1 – Attendees

Name	Organisation
Adrian Burton	Australian National Data Service
Alan Smart	Spatial Industries Business Association
Andre Zerger	Bureau of Meteorology
Andrew Woolf	Bureau of Meteorology
Baden Appleyard	Australian Governments Open Access and Licensing Framework
Ben Searle	Australian Bureau of Statistics
Brian Sloan	Department of Defence
Chris Beer	Department of Regional Australia, Local Government, Arts and Sport
Chris Body	Office of Spatial Policy
Clare McLaughlin	Department of Innovation, Industry, Science, Research and Tertiary Education
Craig Walker	University of South Australia
Cynthia Love	Australian National Data Service
Dale Percival	Geoscience Australia
Dan Paull	PSMA Australia Limited
Dave Doherty	Australian Government Information Management Office
David Flanders	Australian National Data Service
David Jarratt	Department of Innovation, Industry, Science, Research and Tertiary Education
David Lemon	Commonwealth Scientific and Industrial Research Organisation
David McMeekin	Cooperative Research Centre for Spatial Information
Ed King	Commonwealth Scientific and Industrial Research Organisation
Gary Nairn	Spatial Industries Business Association
Gemma Van Halderen	Australian Bureau of Statistics

Name	Organisation
Greg Laughlin	Australian National Data Service
Gypsy Bhalla	Geoscience Australia
Helen Owens	Office of Spatial Policy
Hugh Durrant-Whyte	National ICT Australia
Jenny Bone	Office of Spatial Policy
Joanne Banyer	Australian Biosecurity Intelligence Network
John la Salle	Commonwealth Scientific and Industrial Research Organisation
John Sheridan	Australian Government Information Management Office
John Weaver	Office of Spatial Policy
Kelly Hart	Office of the Australian Information Commissioner
Kevin Rosenbaum	Department of Defence
Lee Belbin	Commonwealth Scientific and Industrial Research Organisation
Leif Hanlen	National ICT Australia
Lesley Wyborn	Geoscience Australia
Liz Searle	Department of Defence
Mark Alcock	Geoscience Australia
Mark McInerney	Department of Defence
Martin Tomko	University of Melbourne
Mike Maslen	Department of Sustainability, Environment, Water, Population and Communities
Maurits van der Vlugt	Mercury Project Solutions
Neil Thomas	Attorney-General's Department
Peter Doherty	Commonwealth Scientific and Industrial Research Organisation
Peter Woodgate	Cooperative Research Centre for Spatial Information

Name	Organisation
Phil Tickle	Cooperative Research Centre for Spatial Information
Pia Waugh	ACT Government
Richard Sinnott	University of Melbourne
Rob Vertessy	Bureau of Meteorology
Rob Woodcock	Commonwealth Scientific and Industrial Research Organisation
Roger Proctor	Integrated Marine Observing System
Ross Wilkinson	Australian National Data Service
Simon Cox	Commonwealth Scientific and Industrial Research Organisation
Stuart Minchin	Geoscience Australia
Tai On (TO) Chan	Cooperative Research Centre for Spatial Information
Tony Boston	Bureau of Meteorology
Umair Cheema	Australian Biosecurity Intelligence Network
Warwick McDonald	Bureau of Meteorology

Appendix 2 – Group Work

The tables below collate the feed-back from each of the three working group sessions.

Validating the Vision

The Capture in the Table below represents the views of Workshop participants only and are synthesised in section 3.3.1 of the main report. The Workshop convenors and co-hosting agencies agreed that capturing all ideas presented would ensure transparency of the key findings.

Group Work Session 1: Validating the Vision		
1. Please review the Future Infrastructure diagram (please annotate the diagram on the wall)		
a. <i>What elements & components are now available?</i>		
b. <i>What are the important (high priority) components</i>		
c. <i>Can you identify any gaps or missing components?</i>		
	Decouple Apps from Data	
	Missing: "Cultural Aspects"	
	Framework Datasets	
2 What is the role of Government in establishing an information sharing infrastructure?		
	In Scope for Government to do (more)	Out of Scope for Government to do (less)
	Compensate for market failure in service to the community (but allow markets to fail when the public good isn't endangered)	Where competition exists and profit is feasible
	Provide orderly framework (regulation, policy, security, standards)	Build apps
	Act as a trusted provider of authoritative data and information	Charge for most data
	Enable Cultural Change	
	Security Framework	
	Act as Innovation Enabler / remove boundaries for innovation	Develop innovations
	Provide centre of Excellence, not Silos of Excellence	
	Facilitate re-use of data, apps, systems, infrastructure	
	Provide the 'public good'	
	Nothing really out of Scope, but the higher you go in the stack (the more value-add), the lesser the role of government	
3 Please review the Guiding Principles:		Added
<i>Think Big, Start Small, Fail Early, Learn and try Again</i>		Focus on "Public Good"
<i>Linkage, Leverage, Longevity</i>		Find and promote "Champions"

Group Work Session 1: Validating the Vision	
<i>Keep Applying the Test</i>	“Leverage”, no need to start from scratch
<i>Standardise only those things that have to be standardised</i>	Licensing & Open Govt data: default position to make data available
<i>Adopt, Adapt, Invent</i>	Persist!
	Interoperability, collaborating, re-use
	Inclusivity
	Emphasize re-use
	Agile approach - allow to change direction
	Avoid over standardisation that could inhibit innovation
	Enable data & Products
	"Responsibility to Share" principle
Considerations	
Will a single infrastructure work, or do we aim for “manageable set”?	
Learn from others, e.g. INSPIRE ⁶ : simple principles and legal directive (adopt), but prescribed technical specifications (reject)	
4 What are the Application Domains?	
Not prescriptive - build it so anyone can participate	
5 What is the minimum set of building block required for establishing such an information sharing infrastructure? Grouped by:	
a. <i>Technology</i>	Single authoritative source, well documented
b. <i>Governance/Policy</i>	People networks
c. <i>Content</i>	The right culture
d. <i>Standards</i>	Great access to data
	Standards: Common conceptual information model for data exchange

Barriers and Solutions

The Capture in the Table below represents the views of Workshop participants only and are synthesised in section 4.2 of the main report. The Workshop convenors and co-hosting agencies agreed that capturing all ideas presented would ensure transparency of the key findings.

Barriers	How to Overcome

⁶ <http://inspire.jrc.ec.europa.eu/index.cfm/pageid/48>

	Barriers	How to Overcome
1. Governance and Policy	Most content required is not owned by Commonwealth	Don't need to own, but do need rights of access and use.
	Commonwealth agencies pursue individual agreements - stands in way of WOG outcome.	Commonwealth engagement with States & Territories
		There are no agreements with states - agency-by-agency basis, should be at govt-govt level
		Commonwealth agencies pursue individual agreements - stands in way of WOG outcome.
	Risk aversion/acceptance	National Policy for release of Location Datasets
		Guidance for describing/assessing risks associated with release Digital Regulatory Framework
	Cost reduction context in government	"Freemium" pricing models
		Link spatial with other (funded) IM policies
	No WoG policies	OSP is the Solution
	Policies not sufficient for Machine to Machine access	Alter policies to require M2M ability as well as a priority over download
2. Content	Framework data mostly exists already, but different forms.	Not just about pure content, to access and re-use services
	Multiple uses, multiple domains.	Users want harmonized data - moving from aggregated (PSMA model) to federated as technology allows it
		But needs money to improve capability
		Precedents:
		- WDTF modernization fund - crisis (drought) + legislation
		- AuScope GeoSciML deployments - demonstrated community + NCRIS opportunity
		- PSMA - (1992) national interest initiated, capability built and demonstrated ABS+MapInfo, then spun out into private sector
		- Biosecurity - Demonstrated integration, value at national and state levels. Shared issue and interest. Commonwealth funding.
	PSMA licensing model impediment to rational behaviour.	Consolidate licenses and pay PSMA to mediate this?

	Barriers	How to Overcome
	Bottom-up, push model for selection of data to be shared, doesn't always meet user demands	More rigorous user needs assessment
	Duplication of datasets & differences in same content from different organisations	Focus on unique (authoritative) identifiers, not just geometry
		Develop domain standards/models + clearinghouse or register
3. Technology & Standards	Not really a barrier. (2x)	n/a
	Security framework - lack of interfacing with non-spatial systems & networks	Ensure spatial standards are informed by the requirements of the interfacing systems
	Overlapping technologies - selection of technology unclear	Base' Architecture guidance
	Standards are not mandated	Seek a policy instrument for declaring a base or core technology set
	Rapid technology evolution challenges slow moving government	Agile approach
		ID technology elements required for enduring robustness
	Heterogeneous ICT infrastructures	Shared delivery models
	lack of community information models	develop
4. People	Capacity issue - can only hold on to developers for 2 years. As soon as they become competent they get head-hunted.	We do interesting stuff - developers like that!
	"Can't do" culture	Awareness, change mindset
	Agency resistance to Machine to Machine access	Alter policies to require M2M ability as well as a priority over download
5. Discussion	Any Policy will need "Teeth"	
	Need for quantified benefits to determine ROI	
	OAIC policy principles being developed (see publication online http://www.oaic.gov.au/infopolicy-portal/reports_infopolicy.html#PSI_principles)	

Practical Next Steps

The Capture in the Table below represents the views of Workshop participants only and are synthesised in section 4.3 of the main report. The Workshop convenors and co-hosting agencies agreed that capturing all ideas presented would ensure transparency of the key findings.

Activity	Priority (H/M/L)	Timeframe	Responsible
1. Action is to take a risk assessment - What is the risk that using current data technology/processes that Australian Government data would be incorrectly linked to location. - what is the likelihood of that occurring, what is the consequence. Need to consider what decisions, what services.	H	Now 3/6 months	TBC
2. Prioritise government services that would benefit most from the application of improved location information. Benefit to the nation. Efficiency, increased economic activity.	H	Follows on from or part of framework datasets	TBC
- Business Needs Analysis, with user community (NOT spatial community)	H	6 months	OSP, ABS, GA, ANZLIC
5. Make PSMA free, by replacing its revenue stream from an appropriate budget	H	Now	TBC
Sort out PSMA licensing	H (low hanging)	6 months	APS 200
Establish Community of Practice for federated information services, accelerating exemplar projects (e.g. NEII, Water or transport)	H (low hanging)	TBC	OSP / GA
ABS to publish vocabularies in 'modern' (= machine readable) way	H (low hanging)	6 months	ABS
Identify custodians & senior 'permission to publish' approval, outlining publication process	H (low hanging)	TBC	TBC
Demonstrator: acceptable/good practice, making it safe, showing exemplars in operational, as well as innovative, agencies	M	TBC	ABS, BoM (NEII), OAIC, GA, DHS
Document existing, current information management policies, and see how Spatial Information policy fits in.	M	TBC	OSP/OAIC
Governance: clarify responsibilities, develop best practice principles (against OAIC guidelines), implementing Open Govt policy	H	TBC	OSP/OAIC
Discussion			
a. OSP is single point of coordination (not authority) HO happy to help anyone who wants to do that			
b. Key datasets – confirmed in November (ANZLIC Wellington meeting)			
i. Comment: should include 'programmatic access' aspect			
ii. Change "Fundamental" to "Framework"			

- c. Coalition of Willing Champions?
 - i. Dale (GA)
 - ii. Warwick McDonald – NEII
 - iii. ALA

Aspiration statement: “If it’s publicly funded, it’s publicly available”

Appendix 3 – NEII *Prospectus*



National Environmental Information Infrastructure – *Draft Prospectus*

The National Plan for Environmental Information Initiative

The National Plan for Environmental Information (NPEI) initiative is an Australian Government program intended to improve the quality and accessibility of environmental information for decision making. It provides the Australian Government a unique opportunity to achieve integration across key government information infrastructures. The National Environmental Information Infrastructure (NEII) project is both a core solution and activity under the NPEI initiative that will improve access and discovery to fundamental environmental data across Australian Government.

National Environmental Information Infrastructure

The NEII proposes a network of standards-based IT components, supported by a network of collaborators working together to improve discovery and access to fundamental environmental data. Standards define harmonised data exchange formats and protocols to ensure environmental data can be accessed and interpreted in a common manner. This approach also enables stakeholders to rapidly develop and deploy new application use-cases that leverage the data infrastructure.

To ensure sustainability and feasibility the NEII architecture is distributed, standards-conformant and based on existing international best practice. Key outcomes expected to emerge from the NEII include:

- Improved ability to discover, access and use fundamental environmental data through harmonised online data services and web portals.
- A sustainable standards-based distributed environmental information architecture that can support multiple application use cases.

- A governance and collaboration framework for coordination and environmental information standards adoption.

Strategic Context

In addition to the importance of the NEII to the environmental information community, its development comes at a time of increasing recognition of the importance of transparency of all government data and information. This transparency agenda includes the Declaration of Open Government and the Gov2.0 agenda. A related government open information agenda is also being actively championed through the Office of the Australian Information Commissioner and in context of spatial information, through the Office of Spatial Policy.

In both the US and the UK development of an open public information policy is being influenced strongly by semantic web and 'linked data' technologies. It is certain the Australian Government information transparency agenda will play a defining role on organisational, political and technical implementation aspects of the NEII. The NEII could thus become a key enabler for realising a whole of government open information policy agenda.

Phasing the NEII

The NEII vision is ambitious and in its initial phase (2011-2014) it focuses on four primary objectives including:

- 2011-12 - Design and Prototype: establish a proto-operational demonstration platform to test the approach and to support engagement activities.
- 2012-13 – Demonstrate and Collaborate: Expand the demonstration platform to



support specific use cases across Australian Government and establish NEII strategic collaborations through the formation of a NEII working group.

- 2013-14 – Expand and Describe: Better integrate NEII components and formally describe architectures, standards and key learning's.
- 2014-15 – Resource and Expand - Development of an NEII implementation plan

The implementation plan in phase four is particularly important given it will describe ongoing partner roles, resource requirements, and technical specifications to deliver an operationally sustainable NEII founded on the learning's from earlier phases.

A Collaborative Approach

As a core activity under the NPEI initiative the NEII will be initially designed, championed and managed by the Bureau of Meteorology Environmental Information Services Program. However its ongoing impact will only be realised through technical and strategic collaborations with the Australian Government environmental information community. This includes collaborations with key policy and operational agencies and the research sector.

The NEII initiative will develop formal collaborations early in its inception to (a) test and demonstrate value in applied settings, (b) jointly establish a strategic agenda, and (c) build a sustainable model for ongoing deployment across Australian Government. This *prospectus* is not an open call but is directed to key NEII stakeholders identified in the NEII engagement plan.

Opportunities for Collaboration

In the 2012-13 phase of NEII opportunities for collaboration include the following:

- **Technical** – working with the Bureau of Meteorology Environmental Information Services Program to configure instances (nodes) of NEII for fundamental datasets to evaluate and demonstrate feasibility.
- **Strategic** – to participate in a working group hosted by the Bureau of Meteorology Environmental Information Services Program to assist in establishing and realising a strategic agenda for the NEII. The focus of this group remains strategic but knowledge and understanding of core NEII principles is valuable.

For further information

For further information about the Bureau's environmental information role, visit www.bom.gov.au/environment or contact environment@bom.gov.au