

FINAL

Strategy Workshop on Education and Skills Development for the Spatial Industry in Australia

27 April 2006, Canberra

Workshop Report

Acknowledgements

ANZLIC - the Spatial Information Council sponsored the workshop. This included funds for the preparation of pre-workshop materials, provision of the workshop venue and facilitator and post workshop reporting. Paul Kelly from Spatial Strategies Pty Ltd was engaged by ANZLIC to write the materials and facilitate the workshop.

John Meyer, the ACT ANZLIC councillor chaired the workshop and provided opening and closing commentary. His personal commitment was a key factor in the workshop being held.

The support of the ANZLIC national office staff, Steve Blake and Mary Walsh, and assistance from Frank Blanchfield was critical to success. The national offices of the Spatial Sciences Institute and the Australian Spatial Information Business Association also provided support before and during the workshop. Other organisations provided information for the pre-workshop background papers and their input is gratefully acknowledged.

Peak spatial industry bodies nominated 20 participants in total, all of whom provided valuable input during the workshop. Their commitment to education and skills formation in the spatial industry was clear and is also gratefully acknowledged.

Finally, all participants appreciated attendance and input at the workshop by Anne Byrne and Eun Sun Oh from the Skills Analysis & Research Strategy Branch, Australian Government Department of Education, Science and Training.

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Document Control

Version	Date	Author	Action
Draft	8 May 2006	Paul Kelly	Sent to workshop participants for comment
Final	31 May 2006	Paul Kelly	Comments from participants included, final version sent to John Meyer for approval and circulation

1. Background to the Workshop

Education and skills formation (E&SF) was identified as an important capacity building element in the Spatial Information Industry Action Agenda (2001). However, while the growing importance of E&SF issues was recognised, it is widely acknowledged that E&SF issues were not adequately addressed during implementation of the Action Agenda.

Indications of growing demand and skill supply shortages are continually appearing. Industry stakeholders are becoming increasingly concerned about limited capacity across sectors, disciplines and regions in the spatial industry to meet both current and future demands for spatial skills. Indications are that there is decreasing spatial literacy being taught in school curricula. Providers of relevant courses in Australian tertiary education and training institutions point to a crisis in both quality and numbers of students in their courses. There is also concern about levels of current investment in workplace training.

Significant effort has already been undertaken by all parts of the spatial industry, but these are fragmented, under-resourced and focus on only some of the overall problems facing the industry. Consequently, key bodies within the industry have called for a more coordinated effort to increase investment in E&SF.

In September 2005, the Spatial Sciences Institute (SSI) and the Australian Spatial Information Business Association (ASIBA) commissioned discussion papers on a strategy for E&SF and the feasibility of increasing investment in E&SF through a Foundation. Subsequently, the SSI sponsored a workshop prior to the SSC2005 Conference in Melbourne, to enable discussion of current efforts and further initiatives that might be needed. Workshop participants identified priority actions in three key areas:

- Firstly the research of current industry capacity, future user needs and a gap analysis to prioritise and focus further investment in industry capacity;
- Secondly, a national marketing campaign based on an agreed industry image that is unique to market (identifies those values and characteristics of the SI industry which are unique) focussed on attracting potential new entrants to the industry into skill groups identified in the gap analysis;
- Thirdly, expanding existing initiatives to support new entrants to the industry, including tertiary education scholarships and cadetships and funding for education facilitators in each State and Territory as a resource for secondary schools.

Participants agreed that further action should be based on:

- Sound information about needs and capacity and analysis of gaps;
- A common agenda across all industry players, using the same language and values for communicating about the industry;
- Identifying and adequately resourcing grass-root initiatives, through in-kind support, grants, levies and matching funding arrangements;
- Developing self-sustaining E&SF initiatives, which are seen as an investment in the future, not an expense.

The conclusion reached at the 2005 workshop was that active involvement and buy-in was needed from all parts of the industry. Cooperation should be achieved by identifying benefits to industry from investment in E&SF and signoff on common vision, objectives and strategy.

The workshop held on 27 April 2006 in Canberra was convened to achieve this common view. Its objectives were:

1. To develop a vision and strategic direction for education and skills formation across the spatial industry.
2. To reach agreement on the elements that will form a coordinated strategy and action plan.

Three background papers were circulated to participants before the workshop. The papers outlined some of the existing problems with E&SF within the industry and potential solutions.

2. Key Conclusions

Workshop participants identified:

- The need to raise the awareness of all stakeholders, including development and enunciation of structured career pathways, marketing should be coordinated;
- The need for factual data about user demand and skill shortages;
- The need for leadership in areas such as a national approach to curriculum development and spatial literacy in schools;
- E&SF initiatives should address real industry needs, with a close relationship between educators and employers in delivering them;
- Recruitment and retention both need to be addressed;
- There is a crisis in existing spatial tertiary education and training, with falling enrolments, quality of students, changing policy environment and pressure on funding;
- In some sectors, the workforce was ageing and retirements will further exacerbate the potential shortage of skilled personnel;
- New skills are required to meet changing user needs and education and training programs need to explore new skill areas and use of modern learning technologies.

There was agreement that a coordinated E&SF strategy was needed that encompassed all players, was national in scope but focussed on particular outcomes to meet specific needs in sectors, disciplines and regions of the industry. If possible, any sector, region and discipline action plans that are developed should be nested within a common national plan. The overall strategy would need to be pragmatic and realistic, focusing on quick results while gathering more information about skill gaps. The strategy would need to have relevance to all sectors, disciplines, regional groups, users and education and training providers with a stake in spatial E&SF. The strategy must be flexible to grow as more information comes to light and can be improved as experience shows what works and what does not. It should also embrace use of modern learning technologies.

Action should be based on coordinated planning that supports local implementation. The workshop participants agreed on the elements making up a strategy, immediate priorities and short-term action.

When deciding priorities the needs of new entrants, existing workforce and users were all identified as priorities as they are all part of the same skills supply chain. A view of this supply chain is shown in Figure 1.

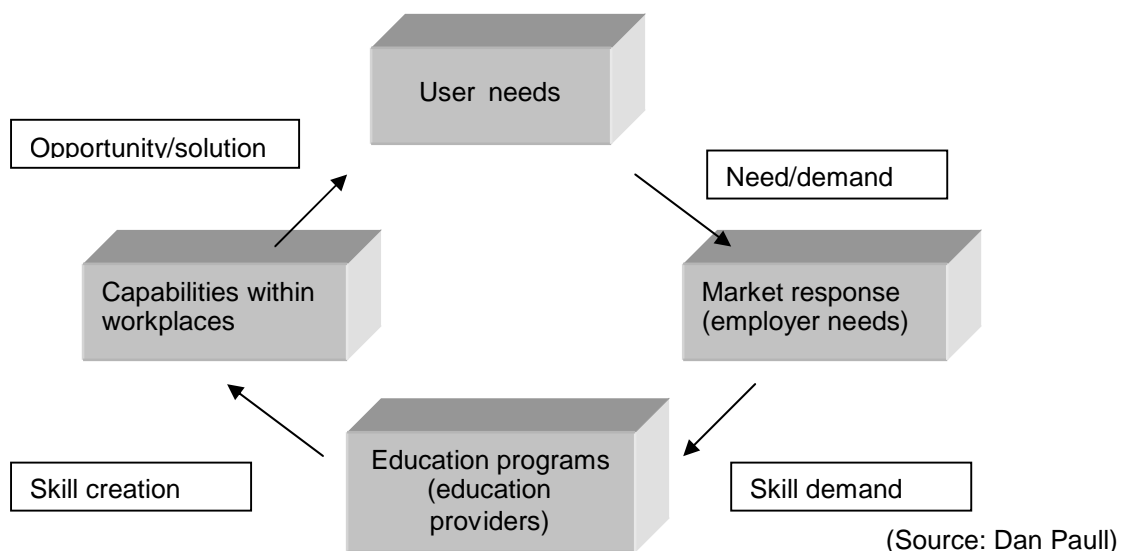


Figure 1: Skills Supply Chain

The spatial industry is still emerging and there is a problem of maintaining momentum in order to be competitive in service delivery and to attract and retain skilled people. Definition of the spatial industry is unclear because of its broad application in many fields. There was debate whether to define it as an industry or a "science" or a "community". This definition transcends E&SF issues and time did not allow the full exploration of this issue, with further consideration needed by the peak bodies represented at the workshop. However, it was recognised that a specific challenge is to define the spatial brand or "identity" as a basis for marketing to users and potential entrants. Note that these issues are addressed in the recent report from the United States Department of Labor *Defining and Communicating Geospatial Industry Workforce Demand: Phase 1 Report* released in May 2006. The definition of the geospatial (spatial) industry in that report is recommended as:

"The geospatial industry acquires, integrates, manages, analyzes, maps, distributes, and uses geographic, temporal and spatial information and knowledge. The industry includes basic and applied research, technology development, education, and applications to address the planning, decision-making, and operational needs of people and organizations of all types."

The use of spatial skills is pervasive, providing a core capability enabling solutions in many fields and is in many ways unique. A coordinated marketing plan should be aimed at attracting new entrants, increasing retention of skilled workforce and raising awareness of users about how spatial products and services can help them. It would need to develop consistent language that was meaningful to intended audiences. A key feature should be promoting flexible pathways from school, gaining qualifications to employment opportunities.

The industry needs to provide people with spatial skills to meet the growing range of user needs, even if those users were not part of the spatial industry. Therefore, the focus for E&SF is not just on jobs within the industry, but also on skilling people who work in user communities.

The skills shortage problem is ill defined, variable across sectors, disciplines and regions and will vary over time. There is lots of anecdotal information, but that it is not a sound basis for prioritising action. There is a need to seek real data wherever it can be found or to collect it if not already available. All the necessary information is not available right now and stakeholders do not have the combined resources to solve all aspects of the problem quickly, so there is a need to prioritise and take short-term action, especially on addressing supply side issues such as attracting new tertiary student entrants.

When it came time to assign roles and responsibilities, it was not clear which existing body had leadership of E&SF issues. This was a structural issue that needed to be resolved over time if a whole-of-industry strategy had any chance of implementation. In the interim, governance arrangements and coordination of jointly funded initiatives needed to be put into place so action could proceed. It was agreed to strengthen the coordinating role of the existing Spatial Education Advisory Committee (SEAC) as a focal point for coordination, communication and cooperation. It was resolved that SEAC should be tasked with coordinating implementation of an agreed national E&SF strategy. However, its current role was restricted to information exchange due to resource constraints. Therefore, its terms of reference will need to be reviewed and strengthened, especially in its role of coordinating strategy implementation.

It was agreed to consider some seed funding for a person or persons to get on with addressing short term priorities identified in the workshop, including analysis of demand and supply, identifying best practices in existing initiatives for potential national implementation, seeking new investment funds and working with stakeholders.

In his closing remarks, the workshop chairman identified three key points arising from the workshop:

1. Importance of a strategy that iterates between needs analysis, awareness raising and marketing.
2. Importance of acting as a united group to gain increased investment.
3. The strategy should not be overly ambitious, but address key issues and provide a way forward.

Bottom line - we need to work together or fail.

3. Vision and Strategic Direction

Vision:

Recognising that people are its greatest resource, the Australian spatial information industry will provide the capacity to meet both present and future demand of its users for relevant spatially-enabled services and products by creating and maintaining a highly skilled, competitive and innovative workforce.

Objectives to achieve this vision are:

- The industry is seen as having people-oriented values that provide a nurturing environment that can attract potential new entrants and encourage existing skilled people to stay in the industry.
- The industry has reached out, raised awareness and engaged with its existing and potential users, enabling better analysis of future demand for spatial skills.
- There is a clear picture of the current and future capacity (both qualitative and quantitative) of the industry's workforce.
- The industry has identified gaps between user demand and supply of needed skills and has programs in place to close these gaps.
- The industry has broadened its catchment of potential entrants and is attractive to young people, skilled migrants and those with complementary skills.
- New entrants have defined career pathways from school, through obtaining qualifications to employment in many application areas.
- The industry has a high retention rate of the existing skilled workforce, with increased mobility into new skill areas to meet changing user demand.
- The industry has access to education and training programs meeting employers' needs and supporting career aspirations.
- Policy makers, users and the community have a clear understanding of the industry's suite of skills, value and capacity to provide skilled people who can help them.

The objectives should be achieved through developing a whole-of-industry strategy which acknowledges that coordinated implementation needs to be done across all parts of the industry, engaging all disciplines, sectors, geographical regions and education and training providers.

4. Developing and Implementing a Strategy

The strategy should comprise the elements shown in Figure 2.

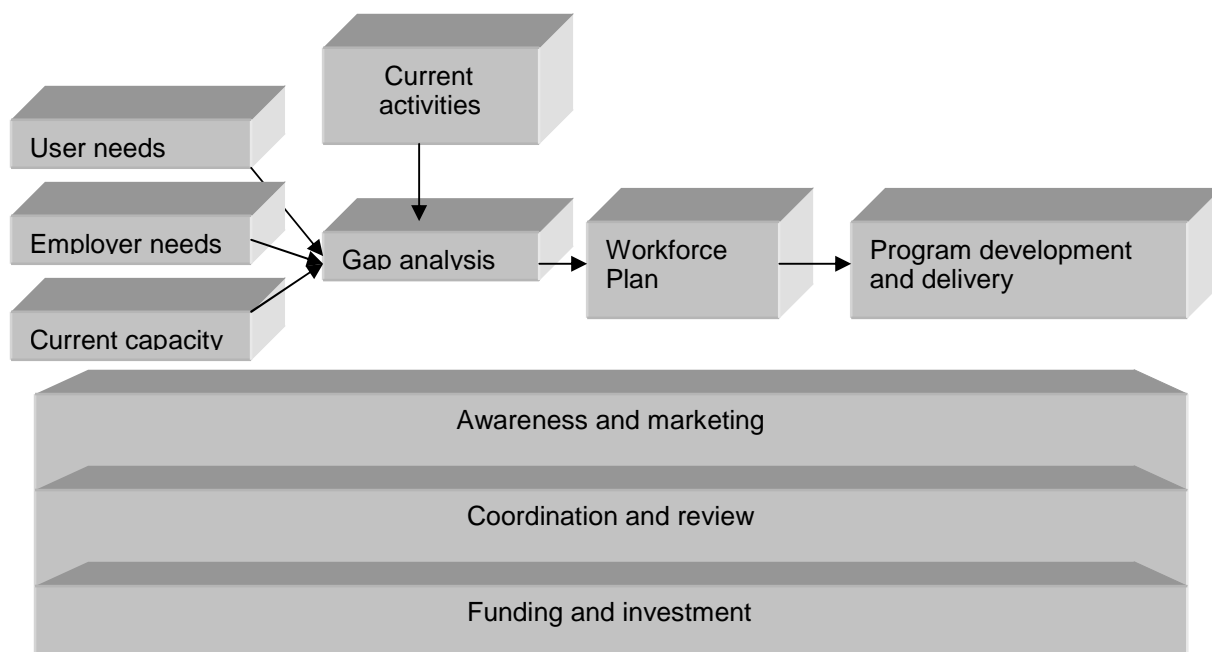


Figure 2: Elements of a national E&SF strategy for the spatial industry

4.1 Spatial skills demand and supply

Objective:

Incrementally improve data about user and employer needs and current capacity available to meet needs to provide snap-shots over defined periods.

Activities:

- Raise awareness with users; break down and describe spatial products and services and develop a value proposition.
- Target specific communities of practice; go beyond those we already know to “non-spatial” communities, for example logistics and health.
- Undertake research to quantify user demand that is driven by factors such as broad economic trends and growth/contraction in specific market segments.
- Undertake research on current and future employer needs for workplace skills.
- Build on industry studies already done to develop a “spatial industry capacity baseline”, including industry size and composition, skills audit and flexibility to grow and move capacity.

Priorities:

- Gather information at local level and build up a national picture.
- Identify resources to carry out a spatial industry capacity baseline, region by region.

4.2 Gap analysis

Objective:

Identify the gap between future demand and capacity of the industry to meet this demand.

Activities:

- Qualitative and quantitative assessment of under-supply or over-supply problems as a basis for deciding targeted activities to address real needs.
- SWOT analysis to highlight strengths, weaknesses, opportunities and threats relevant to closing skill gaps.

Priorities:

- Undertake an initial gap analysis based on existing information about user needs, likely capacity and employer needs.

4.3 Workforce plan

Objective:

The industry has a workforce plan to direct resources to areas of greatest need. The plan also provides information to both employers and employees about opportunities for job growth and training focus.

Activities:

- Identify initiatives focused on retention of existing skilled people and enhancing skill sets.
- Identify measures to increase recruitment in targeted areas.
- Quantify investment needed in education and skills development.
- Improve the plan through iteration as more information becomes available.

Priorities:

- Focus on recruitment, retention and meeting needs of existing users and employers.
- Identify resources that need to be applied to schools, tertiary education and existing workforce training.

4.4 Program development and delivery

Objective:

The industry will be in a position to specify E&SF programs based on greatest need and provide strategic advice to E&SF providers about priorities for developing and delivering these programs.

Activities:

- Assess effectiveness of existing programs.
- Share experience about what has worked and what has not.
- Specify and prioritise new programs based on the workforce plan.
- Assess use of new learning delivery channels such as online delivery of courses.

Priorities:

- Select best practice exhibited by current region based programs and clone into other regions where applicable.
- Examples for assessment include the CRCSI short courses (based on employer research) and the Queensland Spatial Technologies in Schools Project.

4.5 Awareness and marketing

Note that awareness and marketing of the industry is needed for a variety of reasons; improving E&SF is a compelling reason for coordinated marketing and promotion.

Objectives:

- The industry has a national identity accepted by all people within the industry
- The industry uses a common language (terminology, semantics, understanding) scalable to different audiences.
- The industry has a value proposition to put to users.

- Recruitment and retention rates are improved by more clearly enunciating structured career pathways.

Activities:

- Develop a coherent marketing plan and associated promotional efforts that meet E&SF needs, including:
 - Agreed core industry message;
 - Identification of key target groups;
 - Agreed versions of the core message for each identified target group;
 - Identification of best delivery channels for each target group;
 - Agreed coordinated action plan;
 - Agreed performance criteria and review process.
- Identify opportunities for co-investment to develop and implement a common marketing plan
- Access external marketing expertise when funding is available.
- Develop effective promotional material reflecting the industries identity and attractions.

Priorities:

- Identify resources to develop a marketing plan based on a single identity and conveying a consistent message.
- Use the outcomes from the industry branding exercise in 2003 as a starting point.
- Build on existing national (SSI), regional (Queensland) and discipline (NSW) efforts
- Use ACSNSW project for developing content and testing co-investment methodology
- Encourage involvement of all players in developing the E&SF strategy, including participation in the analysis activities and action to fill gaps.
- Explore use of a common website (CRCSI) for industry-wide E&SF information and promotional activity.
- Review and update career advice documents.

Key messages

We invest in E&SF

We have a coordinated approach over the whole industry that targets needs of new entrants, existing workforce and users.

Some messages for new entrants

A career that provides flexibility in education choices, ability to specialise or generalise, to move around, make a good income and is "cool";

Scope for adventure and to make a difference in some of the fundamental problems facing society;

Satisfaction in helping others to visualise their information and solve problems;

Broad opportunities in most industry sectors;

Opportunities in regional Australia and overseas, in fact opportunities to work anywhere;

Very dynamic, action-oriented and with the ability to influence important decisions;

Not just about people with top end skills, also opportunities for all aptitude levels.

Some messages for existing workforce

Industry investing in your future

You are valued, demonstrated through conditions of service and increased opportunity

Able to maintain and enhance your skills

Need for tailored marketing to particular audiences, such as boomers, generation X, generation Y, new entrants and females to match their different perceptions, priorities and motivations.

4.6 Coordination and Review

Objective:

The industry has governance arrangements that enjoin all key players and are capable of sponsoring strategic development, implementation and review of E&SF initiatives.

Activities:

- Provide a focal point for ongoing planning and implementation of a national E&SF strategy.
- Provide an ongoing communication mechanism about E&SF activities between industry bodies.

Priorities:

- SEAC is tasked with coordinating implementation of an agreed national E&SF strategy.
- Review SEAC terms of reference to strengthen its strategy planning, oversight, review and communication roles on E&SF matters.

4.7 Funding and investment

Objective:

Increase access to investment funds for E&SF activities.

Activities:

- Having decided areas of need, support the efforts of industry members and E&SF providers to build effective and sustainable programs to meet these needs.
- Identify opportunities to access untapped investment sources, such as the Departments of Education and external donors.
- Examine the Australian Government National Collaborative Research Infrastructure Strategy (NCRIS) initiative closely in terms of possible opportunities for future funding relevant to the spatial industry.
- Create a sustainable tax-effective investment vehicle(s) to collect, manage and disburse funds for strategic E&SF purposes.

Priorities:

- Identify existing funding sources and quantify current investment in E&SF.
- Seek to increase funds applied to E&SF from existing spatial industry bodies.
- Assess the US High Growth Job Training Initiative as a model for developing a similar proposal in Australia.
- Identify potential funding sources, prioritise and develop submissions for funding.
- Increase industry funding of scholarships and cadetships, both to support tertiary education institutions and for use in promoting the industry to potential entrants.

5. Next Steps

Workshop participants agreed that there should be a business case put together to seek funds to employ a person or persons to implement priority activities in the agreed strategy, especially gap analysis and marketing plan. Tasks may include research, identifying best practice in existing initiatives for potential national implementation, developing consistent careers advice, writing submissions for new investment funds and working with stakeholders.

The following bodies indicated that they would consider providing in the order of \$20,000 each to achieve this outcome:

- ANZLIC
- Heads of University Departments
- ICSM
- SSI
- CRCSI
- ASIBA

- PSMA

Provision of funds would be contingent on:

- Appropriate governance arrangements are in place to assign work priorities based on the agreed strategy, review and report progress, manage the disbursement of funds and manage projects funded by the pool.
- Agreement by governing Boards/Councils of each body.

It was agreed that SEAC was the best body to steer the projects. ANZLIC and the SSI would consider taking on project management and funding disbursement roles. Participants will submit and support the proposal to their respective governing bodies.

Participants felt that this initiative provided a focus for quick action on priorities identified at the workshop and will kick-start the process of implementing the broad strategy to build capacity across the industry to meet user requirements and close skill shortage gaps. It was also acknowledged that all stakeholders will need to pursue specific priorities relevant to them, but wherever possible, in keeping with and supporting the agreed common strategy.

An early task for SEAC will be to develop a detailed action plan based on the agreed strategy, identifying responsibility and targets for individual actions. This would include development of a business case, or "prospectus" outlining governance arrangements and short-term activities to obtain funds and resources contributed by participating bodies.

6. Attachments

6.1 Workshop agenda

Strategy Workshop on Education and Skills Development for the Spatial Industry in Australia

Timing: 9.30am to 3.30pm, Thursday 27 April 2006

Venue: Centenary One Room, Hyatt Hotel, Commonwealth Avenue, Australian Capital Territory

Sponsor: ANZLIC

Invitees: Nominees from ANZLIC (including SEAC and ICSM), SSI, ASIBA, ASIERA, CRCSI, GITA, PSMA, Geoscience Australia and DEST.

Workshop Objectives:

1. To develop a vision and strategic direction for education and skills formation across the spatial industry.
2. To reach agreement on the elements that will form a coordinated strategy and action plan.

Workshop Outline:

Time	Session	Leader/participants
9.15 am	Coffee on arrival	
9.30	Welcome, introductions and aspirations	John Meyer, Chair
9.50	Background, workshop objectives and format	Paul Kelly, Facilitator
10.10	Current situation and key challenges	Facilitator/Heads of delegations
11.00	Morning Tea	
11.15	What can we achieve – a common vision and set of objectives	Facilitator/All
12.00	Where do we put our effort – strategy and priorities for action	Facilitator/All
1.00pm	Lunch	
1.30	Who does what – roles and responsibilities	Facilitator/All
2.00	How do we proceed from here	Facilitator/All
3.00	Summary and conclusions	Chair
3.30	End of workshop	

6.2 List of attendees

Education and Skills Development for the Spatial Industry – Invitation to attend a Strategy Workshop in Canberra

Name	Nominating Body	Comments
John Meyer	ANZLIC	Chair, opening and closing remarks
Steve Blake	ANZLIC	Whiteboard scribe
Frank Blanchfield	ANZLIC	Note-taker
Mary Walsh	ANZLIC	Note-taker
Rod Nairn	ICSM*	Navy Hydrographer
Noel Hamey	SEAC*	SEAC convener
Judy Huxley	Geoscience Australia	Nominated by Peter Holland
Mike Ridout	CRCSI*	
Bert Veenendaal	CRCSI	From Curtin Uni WA
Anne Byrne	DEST*	Branch Manager
Eun Sun Oh	DEST	
Dan Paul	PSMA*	
George Havakis	ASIBA	ASIBA Victoria
Diane North	ASIBA	Surveying sector NSW
David Hocking	ASIBA*	ASIBA CEO
Tim Barker	SSI*	SSI President, from Queensland
Tony Snow	SSI	From WA
Renee Bartolo	SSI	Young Professionals
Jim Connolly	SSI	SSI CEO, note-taker
Chris Bellman	ASIERA*	University HoD
Paul Kelly		Facilitator

* Provided an opening statement in session 3 on behalf of their nominating body.

6.3 List of sources and publications

ANZLIC: *Roles of the public and private sectors in the SII* - <http://www.anzlic.org.au/>

ASIBA Victoria: [Victorian Spatial Industry Census](#) - Melbourne, 2005.

Australian Government Department of Education, Science and Training: *Audit of Science, Engineering and Technology Skills Discussion Paper* - April 2005.

Australian Government Department of Industry, Science and Resources: *Positioning for Growth: Spatial Information Action Agenda* - September 2001.

Australasian Spatial Information Education and Research Association: *Report of the Meeting of Heads of Spatial Sciences Departments*, Sydney, February 2006.

Baker, Hazel: *Shortages Drive Skills Surveys* - Position Magazine June/July 2005.

Blanchfield, Frank: *Registered Surveyors – An Endangered Species* –paper for discussion by a meeting of the East Coast Surveyors Boards, Sydney, 15 November 2005.

Blanchfield, Frank: *Briefing Paper* - ACT Commissioner for Surveys, dated October 2005

CRCSI 2005: *National Training Needs Analysis*, Cooperative Research Centre for Spatial Information, 2005.

Directions Magazine: *U.S. Department of Labor Issues Report on Geospatial Technologies* – 30 July 2004

Douglas, Bruce: *Training/Skilling in the Spatial Information Industry* - GITA presentation to the NSW Surveying and Mapping Industry Council, Sydney, February 2005.

Kelly, Paul: *Discussion Paper - A Strategic Approach To Education And Skills Formation In The Spatial Sciences* – prepared for SSI and ASIBA, unpublished paper April 2005.

Kelly, Paul: *Proposal for a Spatial Education and Training Foundation* – prepared for SSI and ASIBA, unpublished paper April 2005.

Kelly, Paul and Chipchase Cathy: *Drain, Train, Gain: Addressing Skill Shortages in the Spatial Information Industry* - Proceedings of SSC 2005 Spatial Intelligence, Innovation and Praxis: The national biennial Conference of the Spatial Sciences Institute, Melbourne, September, 2005.

Kelly, Paul: *Towards Skills Formation: Report On Education And Skills Formation Strategy Workshop* – Position Magazine, December 2005 / January 2006.

Kelly, Paul: *Background Papers 1,2 and 3* – prepared for the Strategy Workshop on Education and Skills Development for the Spatial Industry in Australia, April 2006.

Marble, Duane: *Defining the Components of the Geospatial Workforce—Who Are We?* - ArcNews Online, Winter 2005/2006.

Professions Australia: *Skills Mapping: Assessing Australia's Longer Term Requirements for Professional Skills* – February 2005.

US Department of Labor, GITA, AAG: *Defining and Communicating Geospatial Industry Workforce Demand: Phase 1 Report* – May 2006