Australasia's Surveying Skills Crisis - Is it Marketing Failure?

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Key Words: Recruitment, marketing, graduates, employment

SUMMARY

The surveying profession in Australasia is on the cusp of an enormous skills shortage. For the last three years, the ratio of BSurv graduates to jobs available has been approximately 1:2 in New Zealand, with anecdotal evidence suggesting that it is much higher than this in Australia. Starting salaries for New Zealand surveying graduates have climbed sharply in the last three years and now sit at approximately $NZ 44,000 – well above the average for graduates in other professional disciplines. Recent recruitment data provided by Australian employers suggest even higher starting salaries in Australia. Numerous employers, in both countries, report that despite ongoing advertising for staff they are unable to attract appropriately skilled employees.

This paper discusses the reasons for the present skills shortage, suggesting that its root cause lies in years of strong economic growth combined with new and broader job opportunities – all at a time when graduate numbers have typically been either stable or decreasing.

The paper then looks at the successful New Zealand experience in marketing a career in surveying, outlining some of the primary lessons learned. These include such factors as building momentum, keeping the message simple, using good communication tools and identifying and targeting the primary audiences. Added to these factors are a range of wider marketing issues that include coordinating closely both with the surveying profession in its marketing efforts, and with any government strategic initiatives that may be taken.

The paper concludes by listing future challenges that the surveying profession in Australasia faces if a skills crisis is to be averted. These include the demographic challenge posed by the retirement of the post-World War II generation, the marketing challenge faced in successfully promoting a career in surveying, the educational challenge of finding appropriate staff to replace those in universities who will soon retire, and the professional challenge of better promoting the skills of surveyors to other professionals and to the wider public.

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1. INTRODUCTION

While New Zealand and Australia might be different nations, they are near neighbours and have many similarities. Both were colonies of Great Britain, both were settled by English speaking peoples at approximately the same time in history, and both have fought alongside each other in various international conflicts. This common heritage has led to similar surveying and land title systems. Indeed, there are reciprocal arrangements between the two nations such that surveyors registered (licensed) in one jurisdiction can practice in the other. Furthermore, the Institution of Surveyors Australia and the New Zealand Institute of Surveyors (NZIS) have a Trans Tasman Cooperation Agreement that allows for joint publications and joint conferences. In many respects it is very easy for Australian and New Zealand nationals to live and work in either country. A New Zealand surveyor is thus able to work in Australia with ease, and vice versa.

Due to the relative size of the population of Australia (20 million) versus 4 million in New Zealand, its higher salary structure for surveyors, and its lower tax rates, a skills shortage there will have a far greater impact upon New Zealand than a skills shortage in New Zealand is likely to have upon Australia. This paper, while written from a New Zealand perspective attempts to give a regional view of a surveying skills crisis that is in the making. This crisis is seen in the unprecedented demand from the surveying profession for staff with surveying, or associated skills. In recent years the number of positions advertised by New Zealand employers seeking surveying graduates has outstripped the number of graduates available from the sole provider, the University of Otago, by a ratio of approximately 2:1. Those few New Zealand students who have sought employment in Australia have found an even greater demand for graduates. They report that 8 – 10 job offers can easily be obtained within a few days of arrival in Australia.

This unprecedented increase in demand for graduates has, in turn, dramatically increased graduate salaries. Due to relativity issues within employing organisations, these salary increases have flowed up the organizational ranks. Whereas 10 years ago starting salaries for BSurv graduates were barely competitive with those of other professions, they are now more than competitive.

At the University of Otago, the increasing popularity of the BSurv programme (more students than places available in the degree) would seem to reflect the reputation that surveying is gaining in New Zealand as a desirable profession to enter. If Otago is in the position of turning away students due to the popularity of its degree programme, why do many such programmes in Australia seem to be facing the opposite problem? Why is it that some Australian surveying

programmes are now barely viable (due to insufficient students), and that the total sum of their graduates is far short of national demand? What are the future prospects for employers in the region? Has there been a failure by the surveying profession to market itself and its career prospects in an attractive and compelling manner? These issues are the focus of this paper.

2. REASONS FOR THE PRESENT SKILLS CRISIS

The following are suggested as reasons for the present shortfall of surveying graduates.

2.1 Sustained Economic Growth

Since the early 1990s, both New Zealand and Australia have seen sustained economic growth with Australia's annual GDP growth over the decade to 2004 averaging almost 4% (http://www.bca.com.au/upload/Research_Paper_-_Economic _Growth_and_Social_Change.pdf).
In the last two years the minerals boom has exacerbated this growth. While New Zealand's growth has not been as dramatic, it has been one of the better performers in the OECD since the early 1990s with average annual GDP growth exceeding 3% for most of this decade (Whitehead, 2004). This growth has fueled a sustained demand for surveying services across the region.

2.2 Wider Opportunities for Surveying Graduates

Durin this time of sustained economic growth, the number of general practice surveying graduates has fallen. During the last 15 years traditional university surveying programmes in Australia have struggled to obtain their full quota of students whilst others, in frustration with the lack of remuneration and career structure associated with traditional cadastral surveying, have reoriented their programmes to produce graduates better equipped to move into the broader spatial sciences industry. Thus career opportunities for graduates have broadened and higher levels of remuneration have become available to those with an information science orientation to their surveying degree. These new, well remunerated career opportunities have siphoned graduates away from the traditional surveying practice.

New Zealand has not been party to this particular problem. In the mid-1990s, the School of Surveying at the University of Otago made a strategic decision to continue to focus on that which it does well, namely, to producing general practice surveyors. While a few of its graduates have moved into specialist areas such as GIS and hydrographic surveying (it has the only IHO accredited Cat A programme in Australasia), this has not been a general trend.

2.3 The Demise of Technician Training

This has been a particular problem in New Zealand where a very good national programme for training technician surveyors was dismantled in the early 1990s and replaced by something far

inferior (both in terms of academic quality and in availability). At the same time government reforms moved the substantial burden of building and training a cadre of well skilled technician surveyors from its own departments to the private sector. The demise of the former distance taught programme and the delay in building a new qualification in the new competency based framework resulted in technician student numbers almost completely evaporating. Only now are these numbers showing embryonic signs of a recovery.

2.4 New Environmental Legislation

In 1991, New Zealand passed its far reaching Resource Management Act. This Act, rather than being prescriptive in defining rules for land development (one of the primary areas of work for the surveyor), instead required the overarching principle of environment sustainability to be met. The outworking of this legislation and, indeed, the whole concept of environment sustainability has created an additional workload for numerous professional people, one of whom is the surveyor. Anecdotal evidence from New Zealand surveyors suggests a 30% increase in workload over the last decade due to this piece of legislation alone.

In total, therefore, for almost a decade-and-a-half in Australasia there has been an increase in work for the surveyor, and an increase in career opportunities, but no increase in the total numbers of Australian or New Zealand graduates being produced from the various surveying (geomatics) programmes. Although efficiency and productivity gains have been achieved through new technology, these have not altered the balance in the larger skills equation.

3. THE NEW ZEALAND EXPERIENCE

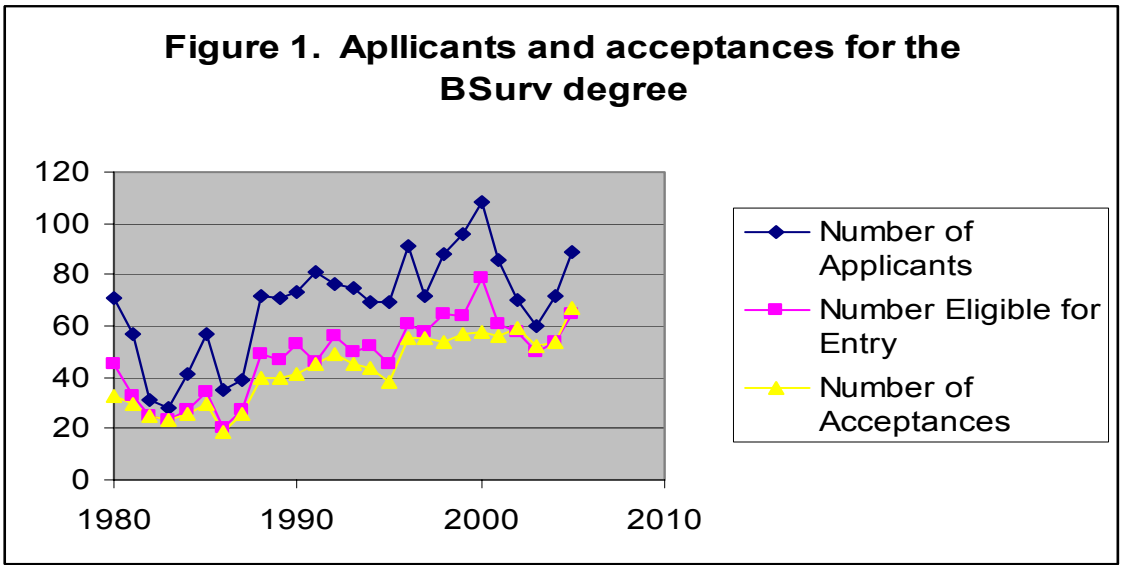
At this point it is useful to separate the New Zealand situation, where the author has developed various approaches to marketing a career in surveying, from the Australian experience. In order to lay the groundwork for the comments that follow, it is useful to consider the situation at the School of Surveying at the University of Otago.

3.1 An Historical Perspective

The School is the only provider of surveying graduates in New Zealand, has strong support from the surveying profession, and presently has approximately 250 full-time students. While the number of first-year students seeking a place in the four-year BSurv programme is unlimited, a quota of only 60 are accepted into the second year. This quota (been driven by resource constraints), rose from 30 to 40 in 1988, from 40 to 50 in 1995, and finally from 50 to 60 in 2006.

Figure 1 below shows the number of applicants seeking admission to the BSurv degree programme at Otago University, those eligible for entry, and the number of acceptances – at least

since 1980. Student numbers in 2006 indicate that the School will receive approximately 130 applications for entry at the end of this year of whom 100 – 110 are expected to be eligible.



It will be observed from Figure 1 that with the exception of the early 1990s and again around 2000, the number of students accepted into the second-year of the degree has closely matched the number eligible for entry (i.e., those who had passed all the necessary pre-requisite papers).

Figure 1 has three other interesting features. Firstly, it reveals the mid-1980s downturn in numbers – a downturn which at that time that resulted in a high school visitation programme being undertaken. Since then and with the exception of 1995, the School has always had more eligible students than its prescribed quota. Secondly, again following that downturn, and with the exception of the period 2002 – 2004, there has been a general upward trend in the number of applicants eligible for entry over the 25 years that data has been collected. Thirdly, it reveals a distinctive peak of applicants in 2000 and a distinctive trough in 2003. Some of the reasons for these variations will be discussed shortly.

Before leaving this section, it is perhaps worth noting that in 1995 the School made a specific decision not to follow the international trend that would have led to a change in name to Geomatics or Geomatic Engineering. At that time, it was reasoned that the real issue in attracting students was marketing and that while such a change in name would produce an immediate flurry of marketing activity (thus potentially increasing student numbers), it would have few, if any long term benefits, at least in the Australasian context (Hannah, et al, 2000). Retaining the name "surveying" not only allowed continuity of brand name, but it also avoided the risk of damaging the relationship with the wider profession who were unlikely to support such a change.

3.2 The Primary Culprit

It is important to recognize that the primary marketing barrier to be overcome (at least in the Australasian context), is the lack of public profile associated with the surveying profession. Few know or understand the knowledge and skills possessed by surveyors or where and how surveyors contribute to society. Indeed, recent market research undertaken by the NZIS reveals that this ignorance extends in many cases to fellow professionals such as lawyers, engineers, accountants and architects. Many of these professionals had a "*surprisingly low level of understanding of the surveyor's tertiary qualification and career path, and some misunderstandings or 'misty view' of a surveyor's skills and knowledge"* (Toner, 2006). Indeed, engineers, in a somewhat misplaced professional prejudice, felt that surveyors should not even be involved in the management of land, let alone in undertaking engineering works for which they are trained. In part, it is this ignorance that must be overcome and that is addressed in some of the issues raised below.

3.3 The Marketing Lessons Learned

Over the years that the School of Surveying has grappled with the issue of marketing its degree programmes to a New Zealand audience, it has learnt a number of lessons, the primary ones of which are listed below.

3.3.1 The Necessity to Build and Maintain Momentum

The following series of events were pivotal in bringing this lesson home. In 1994, shortly after the author arrived at the School of Surveying, three significant marketing activities were undertaken. Firstly, the NZIS released a high quality, professionally produced careers video that was subsequently distributed to every high school in New Zealand. Secondly, the School of Surveying produced its own promotional brochure that paralleled and reinforced the theme of the video – this too was distributed to every high school in New Zealand. Finally, the High School's Liaison Officer at the University of Otago captured the "surveying vision" and began to market actively the superb career opportunities presented by such a career. This marketing effort hit full stride in 1995 with dramatic results, for at the end of 1996 the School received 91 applications for entry into the BSurv degree – a 32% increase over the previous year.

Having watched this upsurge in interest, it was concluded that student interest had been firmly established and that no further promotional efforts would be necessary during the 1996 year. At the same time the High School Liaison Officer left the university. At the end of the 1997 year, applications returned to pre-1996 levels. This down-turn in first-year student numbers in 1997 prompted an ongoing and continuing marketing effort through to the end of 1999. Not only did the School of Surveying work closely with all the High School Liaison Officers (their number had increased by this time), but it also produced at least two new pieces of promotional

information every year and ensured that these were mailed out individually to every careers advisor at every high school in the country. Figure 1 shows clearly how the number of applications for entry into the BSurv degree continued to build over this period.

In 2000, while the author took 12 months of Study Leave, little marketing was undertaken, again on the assumption that existing momentum would carry the day. Indeed, it was well into 2001 before fresh marketing efforts were being made, albeit in a much more competitive marketing environment. The downturn in student interest in surveying at about this time is also a clear feature of Figure 1.

The School launched a new and a more aggressive campaign. All of the previous marketing activities were reinstated but in addition, a new campaign of targeting high school mathematics students was initiated. In this campaign staff from the School will offer to teach senior level high school mathematics classes for a 50 min or 1 hour period. The first 15 – 20 minutes of this time are taken up with a well illustrated, motivating talk about the work of a surveyor with the remainder of the time used to have students solve basic surveying problems using the mathematics that they have been learning. In this way they are able to place their mathematics into the context of practical use. With few exceptions, the teachers are deeply appreciative that someone would make such an effort. Many teachers subsequently seem to become active promoters of a career in surveying. A recent visit to one Wellington high school, in which three one-half hour presentations were made to mathematics classes, yielded four interested students. A similar visit to an Auckland high school in 2005 yielded three students. The goal is now to extend this programme such that others in the profession participate. The apparent success of these efforts can be seen in the dramatic upsurge in first-year student numbers this year

3.3.2 Keep the Message Simple

Over the last 10 years the School has sought to focus on three primary marketing messages:
- Superb career opportunities for surveyors
- The ideal inside/outside job
- Wonderful variety of work.

In recent days a fourth message has been added, namely, excellent professional remuneration. It has been found that these messages are easy to present, capture the attention, and appeal greatly to the New Zealand high school student. In some contexts these messages may require some modification. For example, some working environments may be unpleasant (hot, isolated, and perhaps even with an element of danger). However, working in such environments can lead to exceptionally high incomes – a factor that will appeal to some.

3.3.3 Use Good Communication Tools

While this principle is self-evident, adhering to it can be difficult. As is true with nearly all Australasian surveying programmes, Otago University has sought to develop a range of attractive promotional materials that relate specifically to a career in surveying. It has a brochure plus posters that its uses for capturing student interest, and then a fully illustrated prospectus that it uses for giving a more detailed view of the profession and the degree. It also has a Powerpoint presentation that is easily distributed. Most importantly, however, it is crucial that those who front presentations be motivated, energetic and interesting speakers who can communicate well with teenagers. Typically, presentations stand and fall on this latter point. While recent graduates with such skills are ideal, more senior members of the profession should not be overlooked.

3.3.4 Identify and Target The Important Audiences

In the author's opinion there are three important audiences to be considered: parents, prospective surveying students, and high school teachers. Thus far Otago has done very little work in reaching parents beyond having members of the profession promote the wonderful employment prospects in surveying to their friends and acquaintances.

However, the School of Surveying together with the Otago University high-school liaison staff has been aggressive in reaching the other audiences. The School aims to communicate with all high school careers advisors in New Zealand at least twice each year. In a recent development, the author has had the opportunity to present a workshop at a national conference of high school mathematics teachers on how surveyors can assist high schools in the teaching of senior level mathematics. The focus of this workshop was on the fact that surveyors have the measurement tools and the practical problems which, when combined with classroom theory, can lead to improved learning outcomes. By helping mathematics teachers directly, the profession can help itself, for the teachers, if enthused, will promote a career in surveying to ongoing classes of students. One branch of the NZ Institute of Surveyors promotes and sponsors a regional high schools mathematics competition.

Table 2 shows the origins of the students (as a percentage of the complete entry cohort for that year) entering the Surveying programme at the University of Otago over the last 10 years. In this table, the "Large City" category is considered to be any city with a population in excess of 70,000. The "Smaller Rural Cities" are those with populations between 7,000 and 70,000 whilst students from centres with a lesser population, or with rural addresses, have been classified as "Rural" in origin. The "Other" category includes international students, and those for whom an origin location was not known.

Table 2. Origins of Students Accepted into the Surveying Programme at the University of Otago

Year	**Large City** >70,000	**Smaller Rural City** 7,000<popn.<70,000	**Rural** <7,000	**Other**
1995	26	34	32	8
1996	33	33	24	10
1997	42	32	13	13
1998	28	33	33	6
1999	33	35	26	6
2000	39	33	26	2
2001	37	37	26	
2002	27	38	26	9
2003	33	29	30	8
2004	37	29	34	
2005	24	26	45	5

An analysis of the distribution of New Zealand's population reveals that as of 2001 approximately 57% lived in large cities (as defined above), 20% in smaller rural cities, with the balance of the population (23%) being in rural areas (http://www.citypopulation.de/NewZealand.html). While it can be argued that the distinctions between categories is somewhat arbitrary, it is nevertheless clear that the percentage of surveying students drawn from smaller rural cities or rural areas is typically between 60% - 70% whereas those from the larger cities are typically about 35%. Clearly this does not match the distribution of population.

On average, 30% of the "Large City" students will come from the city of Dunedin (population of 110,000), the home of the School of Surveying. When this is factored into the equation, it becomes very clear that in the New Zealand context, and over the last 10 years at least, a career in surveying has appealed to students either from the smaller rural cities or from rural areas, and not to those from the larger urban cities. The exception to this has been in Dunedin alone, where the School of Surveying seems to do its most effective marketing and has its highest profile. While there has never been a concerted effort to target the smaller rural cities or rural areas, it will be interesting to see if the 2005 and 2006 emphasis on reaching large urban high schools in Auckland and Wellington creates a shift in student origins.

One other comment with respect to target audiences is worthy of note. In traveling the country and taking senior high-school mathematics classes, the author has noted very significant ethnic and social differences around New Zealand. The large Auckland high schools are multi-cultural with some having a high proportion of students with an Asian ethnicity. Experience indicates that such schools typically yield few surveying students, for the prevailing career culture seems to value jobs that not only generate high salaries but also allow one to stay in an air-conditioned

office. Conversely, schools from the smaller urban or rural centres typically have a very high proportion of ethnic New Zealand students. As can be seen from the earlier data, it is these regions that yield a high proportion of New Zealand's surveying students.

In concluding this section on marketing, it is worth noting that if marketing is to be done well, it will be time consuming and it will require commitment. Typically universities only reward staff on the basis of their academic outputs (most importantly, research) and certainly don't reward staff for attracting undergraduate students. However, should undergraduate students not enroll, a programme will quickly come under threat of closure - a situation that is well known in Australia. It is the classical situation where difficulties are faced, whichever action is taken. The best solution, and one which we are seeking to develop in New Zealand, is to find a way of embracing both members of the profession, and others, into the wider marketing effort.

4. WIDER ISSUES

While the previous section describes the marketing work undertaken in New Zealand by the School of Surveying at the University of Otago, this work has not occurred in isolation. The NZIS has supported and encouraged such initiatives by underwriting the production of written materials and a professionally produced video. More recently, and in response to legislative change (Coutts 2004), the NZIS has embraced the new title "Registered Professional Surveyor" for those members who not only hold a four-year BSurv degree or equivalent, but who also show advanced competence and experience in at least two surveying sub-disciplines and who are committed to ongoing professional development.

The NZIS is now embarking upon an aggressive marketing campaign in which it is promoting this title to local authorities and other professional groups as the mark of a widely experienced professional member who has demonstrated a clear commitment to high professional standards and ongoing professional development. The NZIS is indicating its commitment to raising the bar of professionalism amongst its members and to its determination to discipline those few who do not perform at an appropriate professional standard. This campaign includes direct correspondence with all local authorities and advertisements in professional magazines. It also includes new logos and stylized stationary, and is intended to include presentations at a variety of professional conferences. Included in this campaign, and where possible, the NZIS is making the effort to remind its target audiences that the young professional surveyors of today all hold demanding four-year university degrees. In the long term, higher levels of performance and increased professional recognition must be beneficial in attracting young people into the profession, thus helping address the skills crisis.

Apart from this professional initiative, the New Zealand government has also recognized the prospect of looming skills shortages and has funded a "Future in Tech" programme targeted at high-school students. The programme uses "young ambassadors" to visit high schools and discuss with them the career opportunities in specific discipline areas, of which surveying is one.

While the level of funding is relatively low and the results as yet unclear, it is a tangible recognition that a campaign is needed to encourage more high-school students to seek careers in the science and technology disciplines.

5. FUTURE CHALLENGES

In looking to the future, the surveying profession in Australasia faces at least four challenges if a skills crisis is to be averted.

5.1 The Demographic Challenge

The primary challenge here is to attract sufficient numbers of students into the surveying profession in Australasia so as to meet the skill demands imposed by growing economies. These skill demands not only come at a time of increasing infrastructural investment but also at a time when population demographics (in New Zealand at least) suggest that the number of school leavers will decrease for the next 15 years, not regaining current levels until about 2020. These same demographics point to the retirement of the post-World War 2 baby boomers in the next five years or so. Immigration can only be considered to be a partial solution to the problem in that the land tenure, land title and land planning systems in New Zealand and Australia are sufficiently different from their overseas counterparts as to require most immigrants to undertake a lengthy period of re-education if they are to become Licensed (Registered) Surveyors. Many do not have the time or the financial resources to retrain in this way.

5.2 The Marketing Challenge

At the University of Otago, the primary challenge is one of maintaining marketing impetus so as to ensure that competitive entry into the second year of the BSurv degree is maintained in coming years. For many Australian programmes, the challenge is one revitalizing marketing initiatives such that academically competent students seek to enter surveying degree programmes. If this is not done by a concerted marketing effort, then a skills crisis of monumental proportions will surely unfold. While it may be possible to attract part of the New Zealand graduate cohort to Australia, this will be but a trickle of relief in the face of a flood of need.

5.3 The Educational Challenge

Leading national universities (of which Otago is one) continue to place great emphasis on research performance, even if it comes at the expense of teaching quality. In many universities comparative research performance is the single greatest measure of prestige. It is a difficult task for a professional school to balance appropriately its academic and professional responsibilities. Indeed, as senior academic staff retire, and the gap between academic and professional incomes rise (professional incomes being higher), it will become more of a challenge to find academic

staff who have the requisite teaching, research and professional skills. Indeed, even if the marketing issue is solved, the staffing issue may become the crucial factor on whether or not a viable academic programme is able to be maintained in a university environment.

5.4 The Professional Challenge

In the light of Toner's (2006) report, appropriate recognition by the wider public and other professional groups is clearly a significant issue. While the NZIS is moving aggressively to counter this challenge through the use and marketing of its new RPSurv title, no such initiatives appear to be forthcoming in Australia.

More generally, if a shortage of cadastral surveyors leads to severe constraints on land development and the registration of land titles, then the danger exists that governments will seek a way to overcome the problem by registering land that has inappropriate spatial definition. If, however, surveyors focus their professional energies on cadastral surveys only, two different problems arise. Firstly, staff become bored due to the resulting narrowness of professional experience. Secondly, professional incomes fall due to the lower profit margins that are typically part of cadastral surveying. This suggests that surveying practices need to maintain a measure of breadth and variety in their activities if they are to be attractive to young graduates.

6. CONCLUSIONS

There is no doubt that the surveying profession in Australasia is facing a skills shortage. While cogent reasons for this problem can be advanced, in the final analysis and for a number of years insufficient graduates have been produced to meet the market need. In the absence of economic collapse (an event that appears to be unlikely), and if nothing significant is done to address the situation, then this skills shortage can be expected to turn into a skills crisis, if it is not one already. If this is to be avoided it will require concerted action

The School of Surveying at the University of Otago and the New Zealand Institute of Surveyors have moved aggressively to counter this problem, both by improved and expanded marketing activities and by adopting new professional structures. The education of the New Zealand surveyor, while being broad in scope, also allows for a degree of specialization. It is marketed as a career that offers variety, an indoor/outdoor element to the job, a passport to travel, and good remuneration. This message has typically been found to be attractive, not so much to the highly urbanised teenager, but rather to the ethnic New Zealander growing up in the smaller rural cities and the rural areas. This is clearly the area in which the greatest recruiting success has been found over the last 10 years. The dramatic upsurge in first-year students at Otago University in 2006 suggest that recent marketing efforts, which have focused upon some of the larger urban centres, may be having success. The New Zealand experience indicates that good marketing is time and labour intensive, it must be done well if it is to succeed, and that momentum is built over a period of years rather than months.

It is the author's opinion that if the Australian surveying profession, in conjunction with its universities, and possibly even the federal and sate governments, fail to grasp these issues and act decisively in rectifying some of surveying's apparent image problems, then it will face enormous problems in the future. While immigration may assist in some areas, it is unlikely to meet the broader need. Certainly, while New Zealand can try to rebuild its technician education structure, it now lacks sufficient surveying graduates for its own needs and can be of only marginal assistance in meeting the wave of Australian demand.

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BIOGRAPHICAL NOTES

John Hannah BSc, DipSci (Otago), MSc, PhD(Ohio State), MNZIS.

John graduated from the University of Otago with a BSc in Surveying in 1971 following this with a Postgraduate Diploma of Science in 1972. He then worked as both a cadastral and geodetic surveyor for the next four years, becoming a Registered Surveyor in 1974. In 1976 he began study at The Ohio State University, completing an MSc in 1978 and a PhD in 1982. From 1982 until 1988 he held positions, firstly, of Geodetic Scientist and then subsequently, Chief Geodesist/Chief Research Officer with the Department of Lands and Survey, Wellington New Zealand. This was followed by a 17 month appointment to the Chair in Mapping, Charting and Geodesy at the US Naval Postgraduate School, California. After this period of leave he returned to the Department of Survey and Land Information, firstly as Director of Geodesy and subsequently as Director of Photogrammetry. In 1993 he joined the Department of Surveying at the University of Otago as Professor and Head of Department. In 2001 when the Department of Surveying was renamed New Zealand's National School of Surveying, he became the Dean of the School, an administrative role he relinquished at the end of 2004.

John has been a Member of the NZ Institute of Surveyors since 1974 and a Councillor since 1993. In 2005, he was elected President for a two year term. He has been a member of the American Geophysical Union since 1980.

In his professional career, John has worked throughout New Zealand, in North America, Greenland, and the Antarctic. In his career he has won a number of professional awards and educational fellowships, both in New Zealand and overseas.

He is an active researcher with particular interests global sea level rise and in the definition and realisation of spatial datums. He is the co-author of one book chapter, an author or co-author of 21 refereed journal articles and three refereed conference proceedings, plus an author of numerous other non-refereed publications. He was a peer reviewer for the second IPCC assessment report of climate change and is an expert reviewer for the forthcoming fourth assessment report.

Apart from the above, John is vitally interested in educational issues as they impact on surveyors. He has been the coordinator of two major curriculum reviews of the surveying programme at the University of Otago as well as the designer of new technical level qualifications for New Zealand technician surveyors. He teaches papers in surveying mathematics and geodetic reference systems and network analysis.

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