

Women in Surveying

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ABSTRACT

The surveying industry in Queensland is critical to the economic development of the State. However, currently there is a critical shortage of surveyors. A recent demand study shows that this issue will only worsen over the next decade putting significant infrastructure and land development projects at risk. In addition, surveying is a male dominated profession with female participation rates being very low at less than five percent in Queensland. An obvious solution to help address the shortage of surveyors is to encourage more women into the profession. However, despite several programs aimed at achieving this in the past, success has been limited.

The Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (the department) is the lead agency within the Queensland Government for Cadastral Surveying. A research project was undertaken by the department to look at what could be done to address the situation, especially how the leadership and culture in the Surveying Industry in Queensland could be further developed to increase and support female participation in the profession.

In response to the research project findings, the department has established the Women in Surveying program, which aims to increase the number of women in the surveying profession. There are four key deliverables under this initiative:

1. Raise awareness of the issues with the wider industry via presentations at industry conferences/seminars to start a discussion regarding the type of culture that is required to support female participation in surveying.
2. Formalise the creation of a network for women in surveying to create an environment where women can share experiences, support, encourage and inspire one another.
3. Develop a strategy for the appointment of suitable qualified female surveyors to the Surveyors Board of Queensland (SBQ) to ensure gender parity.
4. Create a forum consisting of the key stakeholders within the industry to address strategic issues facing surveying in Queensland, including diversity.

To date, progress against each deliverable is as follows:

- Five presentations have been made to the industry across Queensland highlighting the importance and benefits of diversity and an inclusive culture.
- The Queensland Women in Surveying Forum has been established. The forum currently has 42 members, and is growing, with 5 meetings held since its inception.
- In May 2024, the SBQ reached gender parity in terms of board members.

- The Strategic Surveying Working Group has also been established, with a culture action plan currently under development.

This paper will discuss the result of the women in surveying research project and its findings as well as highlighting the progress against the four key deliverables. Although it is early days in terms of benefits realisation, the paper will also discuss progress to date in creating a culture that attracts and retains women in surveying.

Ensuring the Integrity of Queensland’s Cadastre

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1. INTRODUCTION

Currently there is a critical shortage of land surveyors in Australia. BIS Oxford (2023) demand study shows that this issue will only worsen over the next decade. In addition, surveying is a male dominated profession with female participation rates being very low at around five percent. An obvious solution to these two problems is to encourage more women into the profession, however despite several programs aimed at achieving this, success has been limited. This paper will look at how the leadership and culture in surveying could be improved to further support women participation in the profession.

The surveying industry within Queensland is critical to the economic development of the state. Surveying is a key stage when developing or redeveloping land both in terms of land identification for the titling system as well as construction for the built environment, for example, construction of buildings and roads. In Queensland, surveyors require qualifications and registration to undertake surveys. Section 75 of the *Surveyors Act 1994* prohibits anyone from establishing new or existing land boundaries in Queensland unless they are a Registered Cadastral Surveyor (Cadastral Surveyor).

The Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (the department) is the lead agency within the Queensland government for Cadastral Surveying. In this role, the department is responsible for surveying legislation and policy, appointments to the Surveyor Board of Queensland (SBQ) and, the development, maintenance and ensuring compliance with the cadastral surveying standards.

The department’s regulatory role in surveying puts it in a unique position to influence the culture of the industry and attempt to address this issue.

2. CURRENT SITUATION

One of the functions of the SBQ is to keep a register of persons who are assessed as competent against the competency frameworks. Currently within Queensland there are 425 Cadastral Surveyors registered with the SBQ, and of these only nine are female (Table 1).

Registration status	Total number of Registrants	Female Registrants	Percentage of females
Associate and Graduate Surveyors	766	43	5%

Registration status	Total number of Registrants	Female Registrants	Percentage of females
Registered Surveyors	692	14	2%
Registered Cadastral Surveyor	425	9	2%
Total	1833	66	3%

Table 1 -Registration status of Surveyors in Qld
Source: Surveyors Board of Queensland 2023/4 annual report

Anecdotal evidence from industry is that there is already a long lead time for clients wanting a survey to be undertaken. Several companies are no longer taking on new clients or quoting on new work. Those that manage to secure the services of a surveying firm are paying a premium in terms of professional fees. This, in conjunction with the current housing crisis within Queensland and the government’s desire to bring more affordable land for housing to the market quickly, means that this trend of declining Cadastral Surveyors needs to be addressed, otherwise it may impede the growth of the land development industry.

The SBQ (2021) has identified this situation as a “significant issue of concern to the board, continues to be the steady decline in the number of registered Cadastral Surveyors”. If this trend is not addressed shortly, the lack of Cadastral Surveyors will start to impede the growth of the land development industry in Queensland. BIS Oxford (2023), in their demand study for surveying and spatial sciences, states that in Queensland alone, approximately 1400 new surveyors and spatial professionals will be required in the next decade to meet the forecast demand. This represents a thirty-five percent increase in the current size of the work force.

More surveyors over the next decade are required to support the economic development of the state and ensure successful delivery of significant infrastructure for the Olympics and Paralympics in 2032. Clearly, more needs to be done to attract surveyors into the profession.

The research question posed is, does the current culture within the surveying industry support female participation? And if not, what leadership actions are required to address this?

3. RESEARCH ON GENDER EQUALITY

The benefits of gender equality are clear and well researched. Diachkova’s and Kontoboitseva’s (2022) research found that gender equality has a positive impact on economic development. Equally, Morais and Maceira (2017) found that inequalities, leading to reduced female participation comes at a significant cost for society, by leaving a large pool of talent underutilised. As highlighted above, this is a critical point for surveying as overall registration levels have declined over recent years. By tapping into this previously underutilised pool of

talent, the industry and the department, could potentially see an increase in the overall numbers of Cadastral Surveyors.

Burrell et al. (2020) has also identified that there are shortages of females in leadership roles of information technology careers, which includes surveying. Additionally, their research also found that female leaders in higher levels of management resulted in increased profitability, so having a more inclusive workplace is not only good for the individual, but also for the company's financial position.

3.1 United Kingdom and North America

The United Kingdom (UK) and North America faced similar situations in the 1990's and sought to implement strategies to increase female participation in the surveying industry to address the critical shortages. While parity has not yet been met in these jurisdictions there are significantly more females in their surveying industries than in Australia.

While much is known about inclusiveness and gender qualities in other fields, such as education and law, very limited research exists within the surveying field within Australia. Low levels of female participation in surveying is common in Australia, with other jurisdictions having similar female participation rates as Queensland, for example in Victoria only four percent of Cadastral Surveyors are female (Surveyors Board of Victoria, 2020). However, as highlighted earlier, this phenomenon does appear to be a uniquely Australian. In the UK, for example, thirty-one percent of all qualified Surveyors are female, with the numbers in North America being thirty-three percent (ZIPPIA, 2022).

Turnbell, et al, 2002, research in the UK found the lack of positive female role models, work-life balance issues and the existence of a pay gap between males and females marginalised or discouraged women into surveying. They further found that the traditional view of male surveyors in the UK also adversely impacted on female participation and progression within the industry, with many males not perceiving the barriers for females. This lack of awareness, or unconscious bias, could also inadvertently contribute to a culture that is not as supportive of female participation as it could be. For example, registered surveyors in Queensland are required to demonstrate they have maintained their competency for annual registration renewal. There are no policies in place which automatically allow females who are on maternity leave to be exempt from this requirement.

Curry (2022) interviewed three past female presidents of the Royal Institute of Chartered Surveyors in the UK to understand their views on female participation in Surveying in the UK. All three interviewees saw flexibility as the key for success, both in terms of the workplace and home life, when family responsibilities change. They also stated that strong role models are also critical for increasing female participation in surveying. In addition to having strong role models, having female surveyors in senior leadership positions was identified as a critical factor for success. Gender balance on recruitment panels was also identified as having a positive effect

when building inclusive workforces. All these factors were seen as contributing towards the significant increase in female participation over the past 20 years.

However, Curry 2022 did identify that further work was required in family friendly policies, improving organisational behaviours and more inclusive recruitment strategies in the UK. The importance of a network of mentors for females in surveying was also raised as a key strategy to assist in building the supporting environment that allows females to remain in the surveying industry, particularly as their responsibilities outside of work tend to change throughout their careers.

XYHT, an independent publication for geospatial professionals based in North America, commented in a July 2022 article titled, ‘The future for women in surveying is getting brighter all the time’, that “there’s nothing about land surveying that poses a greater challenge for women than men at least not aside from outdated ideas and traditions”. This statement is supported by Turnbull, et al, 2002 finding in the UK that male surveyors may be inadvertently establishing roadblocks to female involvement in the profession.

3.2 Queensland

The keys for success in the UK and North American experience discussed above are closely linked to leadership attributes for transformational and authentic leadership. It is possible that these leadership attributes might be missing or are underdeveloped in surveying profession in Queensland.

As highlighted above, the surveying industry in Queensland is aware that lack of female participation is an issue but only from a representative perspective, however creating a more inclusive culture to encourage more females to consider a career in surveying is not being seen as a solution to the critical shortage of surveyors. The industry has attempted to address this shortage via several programs with limited success. An example of this is “She Maps”, a social enterprise that aims to increase female participations in science, technology, engineering and maths (STEM) related fields by providing support to educators. This and other programs have generated a lot of interest in STEM fields for young women. However, the failure to increase female participation in surveying, despite this program, could suggest that the solution lies elsewhere, possibly with developing a more inclusive culture within the industry.

To better understand the current state and issues facing women in surveying, six surveyors were interviewed in June 2023. The surveyors were a mix of female and male surveyors, had both public and private sector experience, and ranged from new surveyors to the profession to surveyors with several decades of experience. These interviews were approximately an hour long and conducted via Microsoft Teams. Several questions were put to each such as:

1. Do you believe there is trust and respect within surveying?
2. Do you feel empowered to put forward new ideas and is creativity encouraged within surveying?
3. Do you feel motivated and inspired to reach your personal and career goals?

4. Surveying provides you with support to balance work and life?
5. What do you see are the barriers to female participation in surveying?
6. Do you think you have strong female role models, flexible work arrangements and an inclusive culture that would support more female participation in surveying?
7. Do you think male surveyors support female surveyors?

4. RESULTS AND DISCUSSION

While only a small number of surveyors were interviewed, there was broad agreement within the participant group responses to the questions. As expected, each participants' experiences varied greatly based on their years of involvement in the surveying profession.

The issue of trust and respect from the industry was raised by several of the female participants. The industry is less likely to trust the advice that female surveyors provide and in several cases the matter had to be referred to a male surveyor before that advice would be accepted. The issue is present in the broader community as well, with a general lack of understanding from the public that there are female surveyors. Clearly, surveying is seen as a male profession with one female participant answering a call from a member of the public wishing to speak with a surveyor and the member of the public being genuinely surprised that female surveyors exist. "She said oh, you have made my week. I've never spoken to a female surveyor oh, this is just amazing. Really? You're a female surveyor like you're qualified and everything".

Two of the female participants put themselves under pressure to prove they were as good as the male surveyors both in terms of the physical aspect of the role but also in terms of the quality of advice and services they provide to clients. One participant saying, "you would have that pressure on yourself to prove that you are as good as they are [male surveyors]". The other stating "it was hard for me having all that pressure" with regards to the managing the office inquiries when other surveyors are in the field.

Having female surveyors in leadership roles is also identified as an important factor in the attraction and retention of female surveyors to the industry. With one participant stating "one of the reasons I wanted to work here was because it is with other women" with another saying "people can identify themselves with someone... a positive role model that you would look up to".

The lack of male awareness of the challenges facing women in surveying or any male dominated professional was also raised by several participants. One recalling that surveying has historically been seen as "a bit like a boys club and females weren't welcomed". There was broad agreement with the female participants that male surveyors lacked awareness on the challenges facing women and how they can support them.

Fundamentally surveying can be described as, the collection of data, adjustment and manipulation of that data based on known criteria, and finally the presentation of that data. This explains why the people attracted to surveying often have pragmatic and analytical mind sets

and, see things in black and white or right and wrong. This mindset was evident across several participants when they were asked about what the barriers to female participation are; with one participant saying, “I really don’t understand why there not more of them [female surveyors]” and another stating that in their view “there is no discrimination or anything against female surveyors”.

Several of the respondents stated flexible work arrangements was one of the primary reasons for either seeking employment with or staying with an employer. Equally return-to-work arrangements in conjunction with part-time work was seen as a challenge and not well accepted by industry. One participant stating “there’s still some challenges... if you are in what is defined as a full-time role”.

5. RECOMMENDATIONS AND ACTIONS

Given the department’s role as a regulator within surveying, it is uniquely placed to take on a broader leadership role across the wider industry to address this shortcoming. This includes raising awareness of the issues, but also in terms of appointments to the SBQ which the department is responsible for. Appointments to the board are considered significant appointments under Queensland’s cabinet handbook and as such must have gender balance. Historically, this has not been achieved due to the low number of female surveyors that met the minimum requirement under legislation for appointment.

The following recommendations are made for the senior executive management of the department to consider in addressing the key findings in this report:

- Findings of this research be made available to the wider industry via presentations at industry conference and seminars to start a discussion regarding the type of culture that is required to support female participation in surveying.
- Formalise the creation of a network for female surveyors to create an environment where experiences can be shared.
- Develop a strategy for the appointment of an additional female surveyor to the SBQ to ensure gender parity by the next round of appointments in May 2026 (to meet cabinet handbook requirements for significant board appointments in Queensland).
- Create a forum for the consideration and sharing of ideas between the key stakeholders within the surveying industry in Queensland.

6. IMPLEMENTATION OF THE RECOMMENDATIONS

Following approval of the recommended actions listed above, the department’s Women in Surveying program commenced. All recommendations have been undertaken with two of the recommended actions complete and the remaining two ongoing.

6.1 Industry Awareness

Five presentations have been made to the industry highlighting the importance and benefits of diversity and an inclusive culture in surveying, totally approximately 450 attendees across these events in 2024. The aim of these is to challenge the attendees to look at their own business, what their current organisational culture is, does this support and encourage women into surveying and what can be changed so that the business can maximise the benefits of having a more diverse and inclusive approach?

The presentation focused on:

1. Benefits of diversity and inclusion and the impacts on a business bottom line. Research shows diversity increases productivity and profits.
2. Importance of flexible work arrangements. Flexible work arrangements are of benefit to all employees, not just women.
3. Impact of unconscious bias. Many people are unaware of how, or if, this may exist in themselves or their organisation.
4. The role leadership plays in cultural change.

6.2 Women in Surveying Forum

The Queensland Women in Surveying Forum has been established. The forum currently has 42 members, and is growing, with five meetings held since its inception in early 2024. The forum is designed as an environment where women can share experiences, support, encourage and inspire one another. As different people cope and respond to challenges and opportunities in various ways, connecting with similar people can create a safe space to allow people to wholeheartedly be themselves and be heard. For many women in surveying this network is an opportunity for them to be supported, understood and validated in a non-judgemental way.

6.3 Surveyors Board of Queensland (SBQ) Appointments

Gender parity is not only a requirement of Queensland Government boards, which includes the SBQ, but also goes to addressing the lack of women in leadership/senior roles within surveying in Queensland. In May 2024, the SBQ reached gender parity in terms of board members. Turnbull, et al, 2002, research underpins the importance of positive female role models. Parity also contributes significantly towards diversity in the board's discussions and decision making.

6.4 Strategic Surveying Working Group

The Queensland Strategic Surveying Working Group (SSWG) was established in mid-2023 with five meetings being held to-date. The working group is designed to promote collaboration among key surveying industry and government stakeholders to enhance resilience and prosperity within surveying, aimed at broadening perspectives and addressing critical issues effectively. Five key strategic issues facing surveyors were identified by the working group, these include:

1. Modernisation of the cadastre, what is the future?
2. Critical shortage of surveyors
3. Diversity in surveying
4. Digital lodgement of survey information
5. Improved registration pathways

Currently, as part of the diversity topic, a culture action plan is under development by the group for release later in 2025.

7. RESULTS

It is important to review the effect, if any, the research and implementation of the recommendations has had on women in surveying in Queensland. In December 2024, just over 12 months after implementation of the program, the women in surveying forum members from the private and public sectors, were encouraged to complete an online survey to see if any improvements have been made.

The survey consisted of 10 questions listed below:

1. Where do you live/work?
2. Type of surveying organisation you work for?
3. What is your main area of surveying work?
4. Since the end of 2023, the department has implemented several initiatives, please indicate the ones you are aware of/have participated in?
5. In the past 12 months, do you feel more connected within the surveying industry? (i.e. there are others you can go to for advice or discuss issues with)
6. Do you believe there is more trust and respect? i.e. you are more comfortable raising issues and have confidence that an issue you raised will be taken seriously?
7. Do you feel empowered to put forward new ideas within your organisation?
8. Do you feel motivated and inspired and have the necessary support to reach your professional goals? (i.e. finishing your studies, becoming registered, gaining endorsement, etc.)
9. Do you think the culture in relation to inclusion and accepting diversity within the wider surveying industry has improved over the last 12 months?
10. What do you see are the barriers to female participation and retention in surveying?

7.1 Summary of Results

Seventeen responses were received which were evenly split between private surveyors and public sector/academia surveyors with a wide range on experience working in the industry. This represents response rate of more than 40% to the online survey. Around 50% of respondents predominantly work in cadastral surveying with the other main fields of work being engineering surveying, mining surveying and GIS/drafting. The online survey responses are encouraging with the result of the survey being listed below.

- Overall, 88% were aware of at least one of the actions undertaken by the department.
 - Just over 50% were aware of at least two actions.
 - Nearly 25% were aware of three actions.
- 70% feel more connected within surveying industry.
- 70% believe there is more trust and respect within the industry and feel comfortable raising issues and have confidence that they will be taken seriously when they do so.
- 70% feel empowered to put forward new ideas in their organisation.
- Over 82% feel motivated and inspired, and have the necessary support to reach their professional goals.
- Only about 40% believe that the culture within surveying has improved in terms of inclusion and diversity.
- Respondents see the following barriers to female participation in Surveying (in order of the number of responses).
 - Lack of women in leadership roles
 - Lack of flexible work arrangements
 - Social norms and cultural practices
 - Lack of support and mentoring
 - Physical aspect of the role
 - Workplace discrimination and inequity
 - Safety when working in the field (especially alone)
- None of the respondents thought there were no barriers to women in surveying.

7.2 Observations

While these are encouraging results, it is too early to make any finding regarding the impacts of the actions on increasing the overall numbers of female surveyors in Queensland. It is also difficult to attribute any success to this one action alone within the program. Additionally, there are several initiatives underway within the industry towards addressing the shortage of surveyors, which may also contribute to increasing the number of women in surveying.

The concerns identified by the department's research and findings from the original surveyors' interviews support the results of the most recent online survey from women in surveying. This goes some way to validate the key areas the department decided to focus on at the start of the program. The awareness rate for the department's women in surveying program is good. This along with a high level of connection, trust and support are attributable to the success of the women in surveying network.

Only 40% believe culture has improved which is not surprising with cultural reform programs often taking several years to show any tangible signs of change. This result also indicates more needs to be done in terms of the industry awareness, addressing unconscious bias, and the barriers mentioned above. Further reaching presentations may be required as currently these have only been conducted at surveying association sponsored events, so by and large, the

audience is made up of members of these associations. The highest response to barriers in female participation raised by the group was the lack of women in leadership roles.

8. CONCLUSION

While the results are promising, with female surveyors seeing improvements in connection, trust and motivation, less than half believe there has been an improvement in the culture in surveying. It is noted that culture change to encourage, accept and support diversity in surveying requires a sustained effort with successful change often taking several years to achieve.

The 2024 survey is of limited use given the relative short-time the program has been in place, however it does confirm the key areas on which the program is still relevant for female surveyors within the profession. The department is planning to conduct a similar online survey at the end of 2025 or start of 2026 to see if there is more definitive data about the success or otherwise of the program.

The fundamental issues that were identified in the initial research and confirmed by the 2023 interviews and the most recent survey remain, such as:

1. Women in leadership roles
2. Flexible work arrangements
3. Culture
4. Support and mentoring

Until these can be adequately addressed in the surveying industry, Queensland will continue to struggle to attract and retain women in surveying. To successfully address these issues in surveying will require the involvement of all key stakeholders in the profession, not just the department.

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BIOGRAPHICAL NOTES

Ken Sherwood currently holds the position of Director of Surveys within the Queensland Government Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (DNRMMRRD) and has experience in both the public and private sectors across Queensland. He has been a Registered Cadastral Surveyor since 1995. Ken regularly represents the Department at seminars, conferences and committee meetings. As the Director of Surveys, Ken is a Member of the Surveyors Board of Queensland. He is also the Queensland member of the national Intergovernmental Committee on Surveying and Mapping.

Jemma is the Principal Surveyor (Survey Projects) in the Queensland Government DNRMMRRD based in Cairns. Jemma has been actively involved in providing survey advice and land tenure solutions for state land for over twenty years. Jemma is a Registered Cadastral Surveyor with the Surveyors Board of Queensland, one of the 2% mentioned in the paper. Jemma is passionate about the surveying industry and has recently created the Queensland Women in Surveying network as a strategy to increase diversity and support women, like herself, in the industry.

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