

# A COMPENDIUM...

OF TRANSCRIPTS FROM THE BEST OF MENTORING MONDAY SESSIONS & THE GEOHOLICS PODCASTS

COACHING



GOALS



MENTORING

KNOWLEDGE



THE  
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ADD VALUE & MAKE FRIENDS

&

Mentoring  
**MONDAYS**



Women Who Go to Summit

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# Professional Land Surveying: Then, Now, and Where Are We Headed?

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## **Introduction.**

The landscape of the licensing requirements for the land surveying profession has changed dramatically over the past decade. In this article, I will take an in-depth look at where the Nevada Legislature has brought us today, current trends of the profession, and the direction our future actions might take us.

Specifically, I will explore:

- The shift that occurred when Nevada Senate Bill No. 103 passed (B.D.R. 54-408).
- The new distinction between land surveying as a “trade” versus a “profession.”
- The results of my nationwide research into current land surveying educational trends and exam rate statistics; and
- The importance of how and why we should invest energy in the land surveying profession’s future.



## **The History of Nevada Senate Bill No. 103.**

We will start with how and why Nevada Senate Bill No. 103 (SB103) came to fruition. Before SB103 was passed, surveying was not considered a degree-based profession. Rather, it was an apprentice trade. The winds of change began in 1992, with a Florida Supreme Court Decision (*Garden v. Frier* (1992) 602 So.2d 1273) that sought to determine if a land surveyor was a “professional” in relation to Florida’s professional malpractice statute. This case followed an earlier court case (*Pierce v. AALL Insurance Co.* (1988) 531 So.2d 84), which in short said:

*“we hold that a ‘profession’ is any vocation requiring at a minimum a four-year college degree before licensing is possible in Florida. There can be no equivalency exception...a vocation is a profession if any graduate degree is required as a condition of state licensure, without regard to the nature of the undergraduate education.”*

In *Garden v. Frier*, the Florida Supreme Court ruled that land surveying was indeed a trade, as no formal surveying education was required to enter the profession. The Florida Supreme Court’s decision soon led every other state in the nation to review their land surveying licensing requirements. The state of Nevada was no exception.

Let us fast-forward to the Nevada Legislative Session of 1999 and the passage of Senate Bill No. 103 — Committee on Commerce and Labor, Approved June 8, 1999. SB103: The Nevada State Board of Professional Engineers and Land Surveyors’ (BOPE&LS) Bill entitled “*An act relating to professionals. This Bill requires applicants for licensure as professional engineers and land surveyors to be graduates of certain curricula approved by the Nevada State Board of Professional Engineers and Land Surveyors, etc.*”

The Bill incorporated Senate Amendment No. 581 and Assembly Amendment No. 985 and was signed into effect by Nevada’s Governor on June 6, 1999. Key to SB103 was Section 7, which was not scheduled to go into effect until 2010.

To read the full Bill as it was enrolled, please visit:

[https://www.leg.state.nv.us/Session/70th1999/bills/SB/SB103\\_EN.pdf](https://www.leg.state.nv.us/Session/70th1999/bills/SB/SB103_EN.pdf)

The 1999 Nevada Senate Committee on Commerce and Labor meeting contained some interesting Meeting Minutes dated February



12, 1999. These Meeting Minutes show initial discussions that resulted in what would become the final SB103 language. Below are the positions held by three (3) of the key individuals in attendance.

- a. **Larry L. Spittler**, Lobbyist, American Consulting Engineers Council of Nevada (ACEC/Nevada), read from a prepared testimony stating that ACEC/Nevada could not support the elimination of the experience and testing option for land surveying licensure because it may lead to an artificially induced shortage of licensed land surveyors.
- b. **Senator Raymond C. Shaffer** commented that most land surveyors work beneath engineers. Because many engineering companies had their own land surveyors, this meant that there was typically someone on the record and responsible, therefore protecting the public.
- c. **Rita Lumos, P.L.S.**, pointed out that although surveying and engineering were often housed within the same firm, they were separate positions. Thus, the engineer had no authority under the law to oversee land surveying. She also stated the Nevada Association of Land Surveyors had been working towards establishing a degreed program at the University of Nevada, Las Vegas (UNLV), and that there was an existing 2-year program in place at the Community College of Southern Nevada with 78 students enrolled. Finally, she argued that Nevada's 400 existing licensed surveyors were on a path that required further education. In short, both national and local trends demonstrated a need to keep standards high and move towards a degree-based profession.

Needless to say, the resulting SB103 favored the position of Ms. Lumos, and a trajectory was set in Nevada that would shift land surveying from the realm of trade to the realm of profession.

### ***Trade Versus Profession – What Do These Terms Mean?***

A discussion of trade vs. profession should start by defining the terms in question. According to *Black's Law Dictionary*, the term "profession" is defined as a vocation requiring special or advanced education, knowledge, and skill. The labor and skill involved is predominantly mental or intellectual, rather than physical or manual.

In contrast, *Black's Law Dictionary* defines a "tradesman" as a "mechanic, craftsman, or artificer of any kind, whose livelihood depends primarily on the labor of his hands." Further, it defines a trade as a business or industry occupation; a craft of profession.

As you can see, the real difference between a trade and a profession is education. For Nevada to officially move the land surveying profession from the realm of "trade" to that of a "profession," Nevada needed to change state law and require everyone entering the profession to have a bachelor's degree. As mentioned, SB103 passed in 1999, and the education component of this Bill officially went into effect on July 1, 2010.

You can now see that Nevada had devoted over ten (10) years before 2010 fighting to make land surveying a "profession." Nevertheless, there was another battle brewing on Capitol Hill soon after SB103 went into effect. There is no direct correlation between this battle and SB103, but this back-door decision ultimately hurt the land surveying profession's professionalization.

### ***Progress Prevented: The 2013 "Laborers and Mechanics" Classification.***

On August 4, 2011, the International Union of Operation Engineers (Local 12) sent a letter to Mr. Timothy J. Helm, Chief, Branch of Government Contracts Enforcement - Division of Enforcement Policy and Procedures Wage and Hour Division (W.H.D.) requesting a meeting to discuss the reclassification of land surveyors within the Davis-Bacon wage determination schedules. This 26-page letter stated that land surveyors should be included as part of the Davis-Bacon Act for wages.

In making their argument, the union members did not provide a favorable evaluation of the land surveying profession. The W.H.D. followed through on Local 12's request, and the Union was successful in reclassifying certain individuals of the land survey crew as "laborers and mechanics" within the W.H.D. However, it should be noted that this reclassification does not apply to licensed professional land surveyors or party chiefs working on the site. The Department of Labor's Wage and Hour Division issued an All Agency Memorandum (AAM-212) on March 22, 2013.

**To understand the delta between the land surveying licensed professional and union field staff surveyors, the IUOE letter argues that:**

#### **a. Educational Requirements.**

*There is no minimum level of formal education required to become a field land surveyor. A GED is sufficient. Acting Solicitor of Labor Harold C. Nystrom's August 31, 1960 letter stating: "[R]odmen, chainmen, axemen (grubbing brush, etc.) stakemen, and the like, clearly perform the work of laborers and do not in fact even approach the educational or other qualifications associated with the true professional."*

#### **b. The Jobs of Office Surveyors and Field Surveyors Are Not the Same.**

*The job of a field survey crew is similar to that of a grade checker: to ensure that the heavy equipment operators dig or fill to the correct depth and in the correct location. The office surveyors determine the depth and location based upon measurements provided by the field surveyors and, in turn, provides field surveyors at the site of the work with the necessary step-by-step*

*instructions concerning grade and elevation. The office surveyors make mathematical calculations and plot the coordinates of the locations that need to be staked, and the field surveyors carry out this work, bringing errors and issues to the attention of the project manager, registered engineer, or licensed office surveyor.*

Additionally, the IUOE Letter, page 19 states:

**c. Field Surveyors Are Clearly Not “Professional,” “Semiprofessional,” or “Subprofessional.”**

*In the Davis-Bacon context, the W.H.D. issued an opinion letter characterizing work as “subprofessional” and “semiprofessional” as a justification for failing to extend coverage to skilled tradespersons. Under this view, a field surveyor is clearly not a professional—nor even a “subprofessional” or “semiprofessional.” There is no requirement that field surveyors be licensed, obtain a certification, or earn a college degree or even a high school diploma.*

Thus the framework was laid out for compensating some members of a land survey crew as simple laborers and mechanics—a move separate from but in direct competition to the SB103 movement that sought to solidify land surveying as a profession.

In January 2015, NSPS Federal Lobbyist John “J.B.” Byrd published an article on the XYHT website. In the article, he argued persuasively against the Local 12 Letter and the AAM 212 Memorandum. Byrd stated in no uncertain terms that the surveying community was facing the most serious threat to its professional image in decades. The U.S. Department of Labor—without consultation with the community, public notice, or opportunity for public comment—had issued the Order on March 22, 2013, declaring that members of survey crews are “laborers and mechanics” subject to the controversial Davis-Bacon Act. The Order reversed more than 50 years of policy that, since President John F. Kennedy’s administration, had largely exempted survey crews from the Davis-Bacon Act.

NSPS has strongly objected to the U.S. Department of Labor’s classification of members of land survey crews as laborers and mechanics, stating it is “an affront to the surveying profession” and “detrimental to our profession and an inappropriate demotion of valued and skilled employees.”

Much time and effort have been expended in attempting to reverse the 2013 W.H.D. decision. There have been nine (9) Opinion Letters issued from 1960-1964 listing several examples of the physical work performed by land surveying crews. However, there have also been six (6) W.H.D. Opinion Letters from 1975 to the present that demonstrate a failure to understand the 1960-1964 Opinion Letters from the U.S. Secretary of Labor and the U.S. Solicitor of Labor.

NSPS has not given up on their fight yet. Curtis W. Sumner (Executive Director at NSPS) testified before Congress on June 18, 2013. More recently, on September 8, 2020, NSPS sent a letter to The Honorable James Comer, Ranking Member for the United States House Committee on Oversight and Reform, urging his oversight and investigation into the applicability of Davis-Bacon labor standards to members of land surveying crews.

In a September 8, 2020 letter, Mr. Sumner held that the memorandum “provides no rationale for this change in policy, cites no recent legislation, and references no court case to explain the basis of this new policy. There has been no action by Congress, no ruling by a court, and no other recent development to change a 50+ year policy. Moreover, this change in policy was made with no public notice, no public comment, no consultation with affected stakeholders, no economic or regulatory impact analysis, and no study of its effect on small businesses.”

It goes without saying that Nevada has taken all the right steps to solidify land surveying’s place as a professional career. However, as with most change, it rarely comes easy. Today, we remain faced with defending ourselves against the 2013 issuance of AAM212. In contrast, there is no legal change to the victory of SB103, the W.H.D. consideration of land surveying as being the domain of “laborers and mechanics” is disheartening and could open the door to the profession’s deregulation.

To review the letters referenced above and stay up-to-date with the Davis-Bacon decision, visit the NSPS website:

<https://www.nsp.us.com/general/custom.asp?page=DavisBacon>

### ***2020 Education and Licensing Trends.***

We now know that in 2010 new educational requirements were implemented for all individuals entering the land surveying profession here in Nevada. The question is, what has changed since then? The answer is that we are about to see a dramatic reduction in licensed land surveying personnel in the coming years unless action is taken to attract and nurture new surveying professionals.

To find this answer, I conducted an in-depth national investigation to determine how Nevada has fared since the 2010 implementation of SB103 Section 7 and the trends in other states that adopted similar measures. This meant examining data from all states that publicly provide their existing licensing data.

The first data point to review was the number of licenses awarded to college-educated surveyors from the ten years before SB103 went into effect (2000-2010). The data revealed that there was already an educated applicant base here in Nevada before SB103 went into effect. 53% of those applying had some type of college education and could therefore be considered professionals. 47% of those applying did not have a college education and could therefore be regarded as tradesmen.

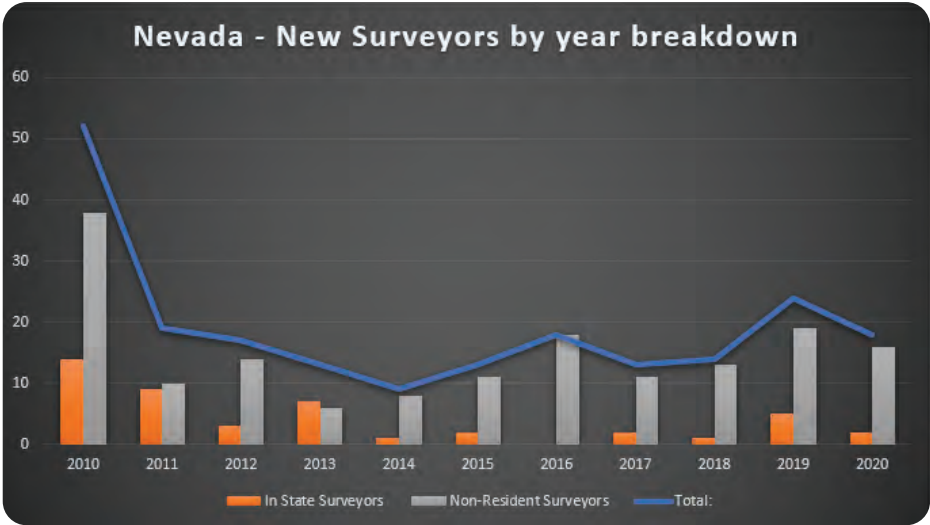
The second data point to review was the number of new licenses awarded during the most recent ten years (2010-2020). In total, I wanted to look at both the ten years preceding the degree requirement and the ten years following the degree requirement set forth by SB103. Below are the numbers for all licenses for both “In-State” and “Out of State” land surveyors. As you can see from the Tables below, there was a big push in 2010 for licensees trying to beat the July 1, 2010, effective date for SB103.

**a. An Aging Workforce.**

Nevada State as of 10/27/2020							
Age Range	Total Active PLS	In State Surveyors	Non-Resident Surveyors	New - Land Surveyors By Year	Total:	In State Surveyors	Non-Resident Surveyors
Nevada could theoretically lose 120 +/- In-State Land Surveyors with an of age 61 and older = 42.2% over the next 10 years. However, for comparison Nevada has only awarded 46 new In State licenses in the last 10 years.				2000	21	0	0
				2001	16	0	0
				2002	18	0	0
				2003	11	0	0
				2004	34	0	0
21-25	1	0	1	2005	31	0	0
26-30	1	0	1	2006	27	0	0
31-35	10	3	7	2007	33	0	0
36-40	31	9	22	2008	43	0	0
41-45	60	25	35	2009	47	0	0
46-50	85	35	50	*2010*	*52*	*14*	*38*
51-55	80	40	40	2011	19	9	10
56-60	109	52	57	2012	17	3	14
61-65	120	49	71	2013	13	7	6
66-70	92	35	57	2014	9	1	8
71-75	52	26	26	2015	13	2	11
76-80	18	4	14	2016	18	0	18
81-85	9	5	4	2017	13	2	11
86-90	1	1	0	2018	14	1	13
91-95	0	0	0	2019	24	5	19
				2020	18	2	16
Total:	669	284	385	Total:	439	32	126

It is shocking when you put the trend of these data points into context. Nevada could theoretically lose 120 “In-State” land surveyors aged 61+ over the next ten years if current trends continue. That is the equivalent of 42.2% of all currently licensed surveyors. In comparison, Nevada has only awarded 32 new “In-State” licenses in the last ten years. This means that Nevada will potentially lose a net of 88 or more land surveyors in the next ten years.

It quickly becomes apparent that land surveying is an aging profession needing an infusion of new members. The data in the following

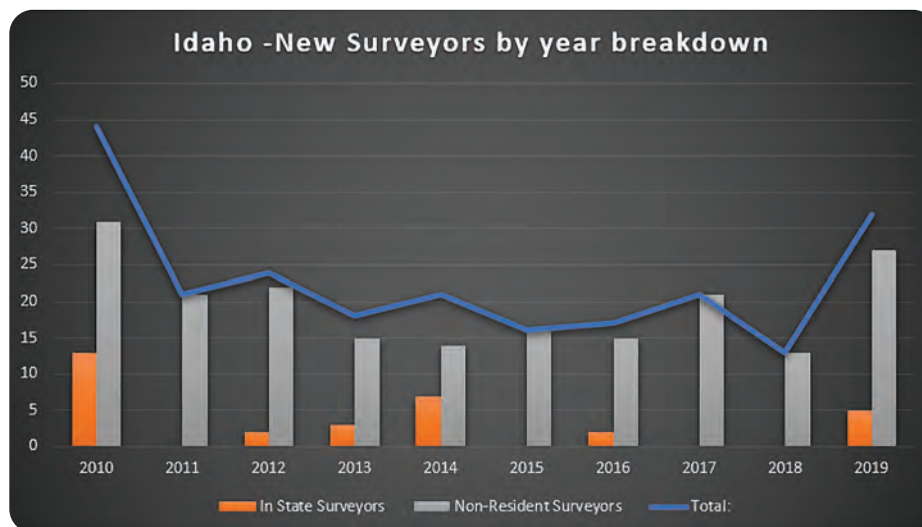




tables illustrate that Nevada is not a unique state in this regard. From California to Florida and almost everywhere in between, the number of anticipated new professionals cannot hope to replace the number of surveyors expected to retire.

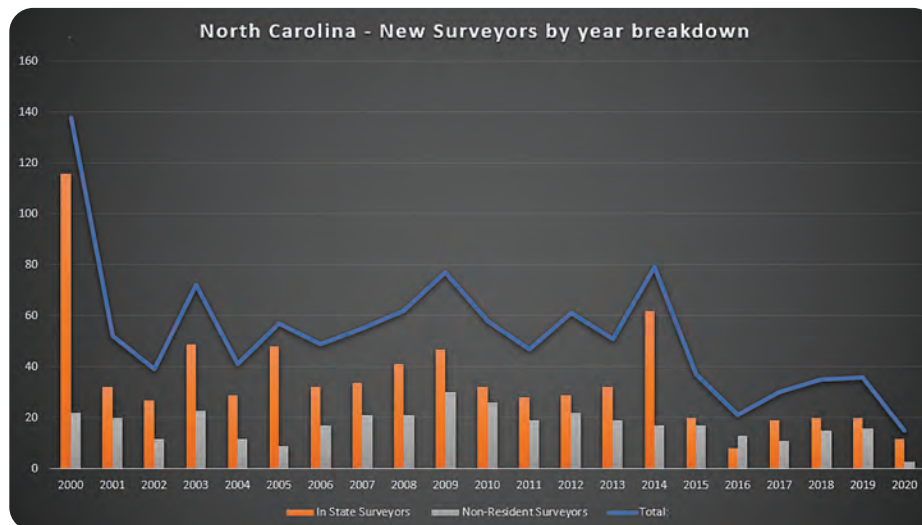
The following data sets are all compared with anyone over the age of 61 that may retire in the next ten years.

Idaho could theoretically lose 102 “In-state” land surveyors aged 61+ over the next ten years. That is the equivalent to 39.3% of all currently licensed land surveyors. In comparison, Idaho has only awarded 32 new licenses in the last ten years.



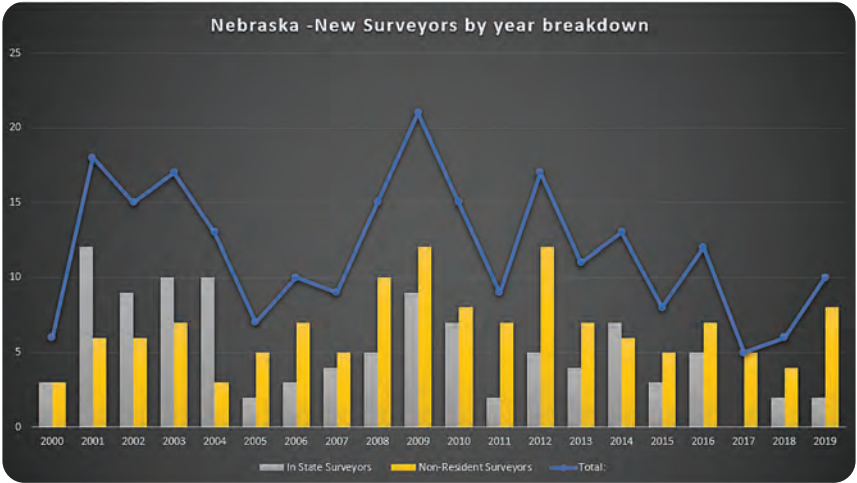
- **Education Requirements:**  
Effective on July 1, 2010, all P.L.S. applicants must have a 4-year degree either in surveying or related science plus 30-semester credits of surveying courses.

North Carolina could theoretically lose 787 in-state land surveyors aged 61+ over the next ten years. That is the equivalent of 43.9% of all currently licensed land surveyors. In comparison, North Carolina has only awarded 250 new licenses in the last ten years.



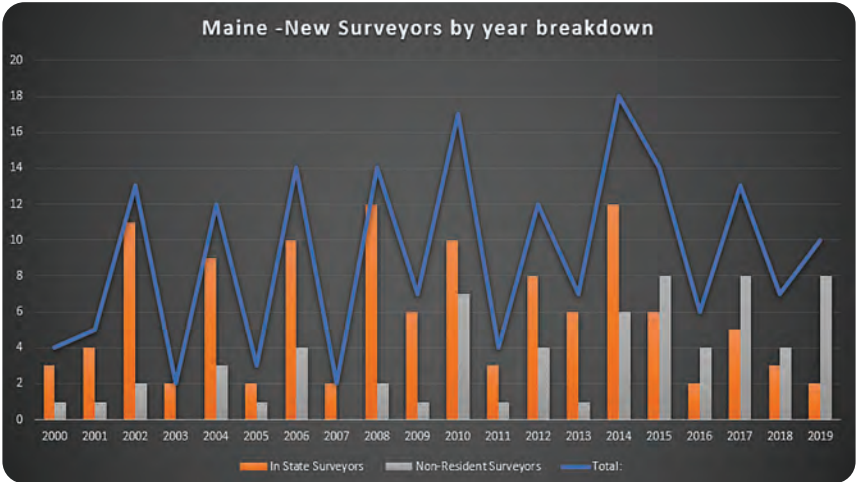
- **Education Requirements:**  
Effective on January 1, 2013, all P.L.S. applicants must have a Bachelor of Science degree in surveying or other equivalent curricula.

Nebraska could theoretically lose 77 in-state land surveyors aged 61+ over the next ten years. That is the equivalent of 38.1% of all currently licensed land surveyors. In comparison, Nebraska has only awarded 37 new licenses in the last ten years.



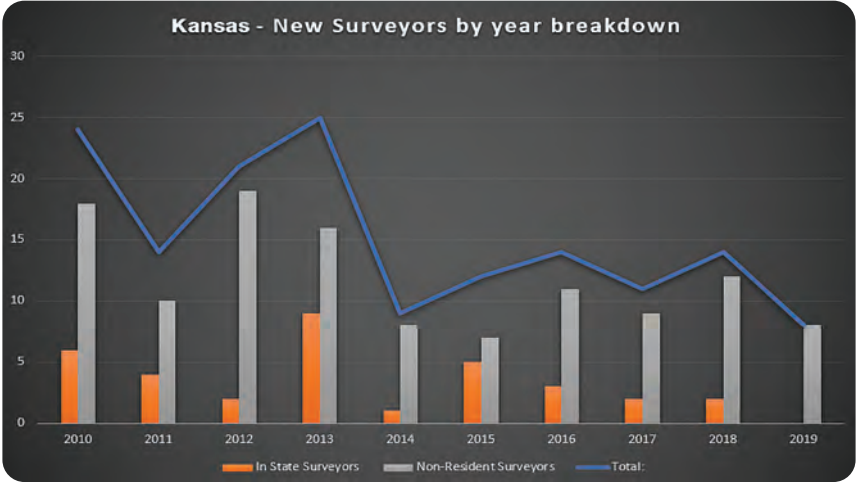
No Education requirements.

Maine could theoretically lose 188 in-state land surveyors aged 61+ over the next ten years. That is the equivalent to 37.8% of all currently licensed land surveyors. In comparison, Maine has only awarded 57 new licenses in the last ten years.



- Education Requirements:  
 There are four ways to get a license in Maine. Either with education, four (4) years bachelor’s degree and no experience or no education, and seven (7) years experience.

Kansas could theoretically lose 174 in-state land surveyors aged 61+ over the next ten years. That is the equivalent of 55.4% of all currently licensed land surveyors. In comparison, Kansas has only awarded 34 new licenses in the last ten years.

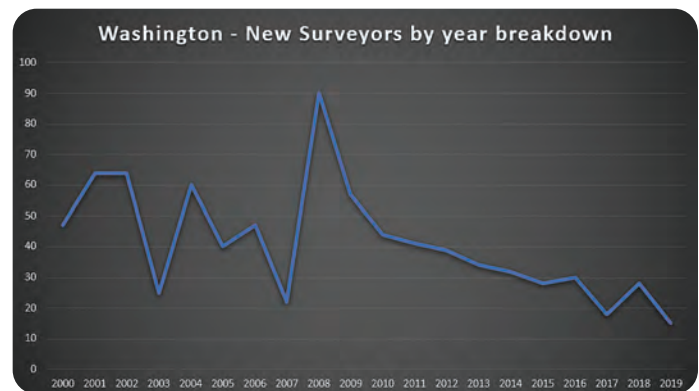
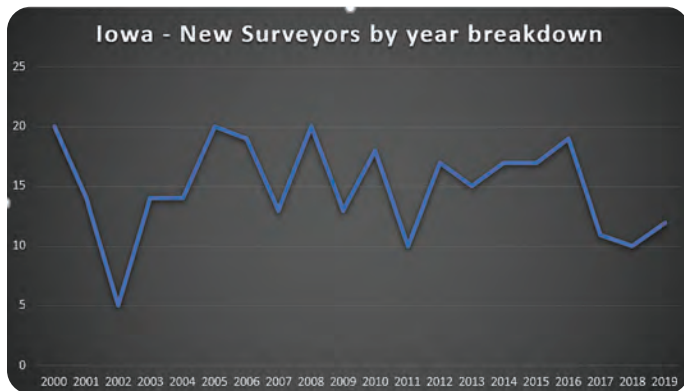


- Education Requirements:  
 graduation from a four-year surveying baccalaureate curriculum accredited by (ABET); implementing K.S.A. 2013 Supp. 74-7022, as amended by 2014 SB 349, sec. 15

The following data sets are for information about the entire state (both In-State and Out-of-State Surveyors).

Iowa could theoretically lose a total of 163 in-state land surveyors aged 61+ over the next ten years. That is the equivalent of 35.9% of all currently licensed land surveyors. In comparison, Iowa has only awarded 146 new licenses in the last ten years.

Washington could theoretically lose a total of 407 in-state land surveyors aged 61+ over the next ten years. That is the equivalent of 40.1% of all currently licensed land surveyors. In comparison, Washington has only awarded 309 new licenses in the last ten years.



The number of new licenses issued by the states to “In-State” land surveyors versus the number of licenses issued to “Out-of-State” land surveyors is drastically different. When you look at the number of land surveyors combined in the two totals above from Washington and Iowa, the “Net” number is not alarming because we have added the reciprocity numbers to the data sets.

A few other notable data sets from other states continue to show a downward trend. These states did not provide a full data set, so I could not thoroughly compare the data. However, I feel the data gives an accurate representation surrounding the numbers of in-state land surveyors.

- South Carolina could lose 379 +/- In-State Land Surveyors with an age of 61 and older (40.1%) over the next ten (10) years. However, for comparison, South Carolina has only awarded 299 new In-State licenses in the last twenty (20) years.
- Florida could lose 1,297 surveyors (50.12%) over the next ten (10) years. However, for comparison, Florida has only licensed 1,292 in the last twenty (20) years.
- Montana could lose 79 +/- In-State Land Surveyors with an age of 61 and older (35.9%) over the next ten (10) years. However, for comparison, Montana has only awarded 53 new In-State licenses in the last ten (10) years.
- New Mexico has more Out of State Land Surveyors (300) than In-State Land Surveyors (250).
- Wyoming has more Out of State Land Surveyors (196) than In-State Land Surveyors (148).
- Arizona is very close in numbers for both In-State Land Surveyors (914) and Out of State Land Surveyors (712). There was no age data provided; however, Arizona did say they have licensed 797 land surveyors in the last twenty (20) years. They have about 524 licenses that either retired, canceled, expired, etc., since 2000. However, of the 797, I was not provided a split on In-State versus Out-of-State land surveyors.

The real data is found in the primary home state, where the land surveyor practices. For example, I am personally licensed in five (5) states. Another land surveyor in my office is licensed in seven (7) states. Our main work focus is Nevada; however, we have 12 licenses between us. Add our colleague Steve Parrish, P.L.S., to the mix, and suddenly we have 22 licenses between just three (3) land surveyors. Now there are roughly 50,000 licenses in the United States, but what is the real number? The fact that the number of national licensees remains steady over time could be misleading, as many surveyors have earned multiple state licensures.

### ***Average Age at Licensure.***

One additional point that should be made is the exceedingly long time for the average land surveyor to obtain a professional license in the United States. In Nevada, the average age of an individual obtaining their Professional Licensure is 42 years old. According to the data in the 2019 NCEES Squared Report, national trends follow suit. The average age of individuals taking The Principles and Practice of Surveying (P.S.) exam is just under 39 years old. In comparison, the national average of individuals taking The Fundamentals of Surveying (F.S.) exam is just over 34 years old.

The fact that it takes a minimum of 8-10 years to become a professional land surveyor in most states is problematic. In some cases, it will take you longer to become a professional land surveyor than it will to become a dentist! We need to explore ways to help expedite this process to get young surveyors started on their professional journeys much sooner in their careers.

### ***College Enrollment Trends and Licensure Examinations.***

In terms of what is happening at college campuses, enrollments have been relatively steady. Most programs graduate five (5) or six (6) students per year. The most recent National Council of Examiners for Engineering and Surveying (NCEES) report shows some interesting trends.



First-time exam takers of The Fundamentals of Surveying (F.S.) are going up, with a 40% increase in first-time exam takers between 2015 and 2019. As a refresher, the F.S. exam is designed for recent college graduates and college students who are close to completing an undergraduate degree in surveying. Passing this exam is an essential first step in the surveying licensure process. The roughly six-hour computer-based exam is comprised of 110 questions and is administered year-round.

However, first-time exam takers of The Principles and Practice of Surveying (P.S.) are going down, with 15% fewer exam takers than in 2015. The P.S. exam is designed for surveyors who have gained at least four (4) years of work experience in their respective field. It is an eight-hour computer-based exam.

NCEES seeks to address this downward trend by focusing on recruitment in the geomatics profession. With a coalition of interested parties, NCEES is formally focused on the surveying profession's needs by enhancing current efforts nationwide. These new opportunities to bring recruitment, education, and diversity to the surveying profession work are carried out in tandem with NCEES goals, which are to promote the value of licensure and increase the number of people entering the surveying workforce. In July 2020, Marisa Trzemzalski became a member of the NCEES Public Affairs team. At NCEES, Marisa works closely with Surveying Candidate Objectives for Recruitment and Education (SCORE) partners on surveying marketing and outreach projects. She coordinates NCEES surveying marketing activities through print and digital advertising, exhibitions, and sponsored collaborations. She is also responsible for marketing NCEES services, promoting the value of licensure in surveying, and coordinating K-12 surveying outreach events.

### ***Investing in Our Profession's Future.***

Land surveying has undoubtedly come a long way over the years. Surveyors today can work with technologies that those before us could only have dreamed of. This is not to suggest that today's land surveyors are better or more experienced than those of the past. We merely have a more advanced set of tools allowing us to create more accurate results.

The advancement of technologies comes with a price. We now need the higher educated and more advanced workforce to complete the everyday tasks of creating a boundary survey or running the advanced software to make the 3D Building Information Modeling (BIM). We need to pursue this goal of professionalization while simultaneously combatting the effects of an aging workforce and jumpstart a new generation of young surveyors on the road to licensure.

Listed below are some first thoughts on revitalizing the land surveying profession and better preparing for the years ahead.

#### **a. Invest in STEM (Science, Technology, Engineering, and Math) Education.**

1. Work with your local technical high schools.
2. Identify the Work-Based Learning Coordinators for each school district.
3. Promote the Get Kids Into Survey initiative and become a Brand Ambassador.
4. Continue to teach the Surveying Merit Badge contents to the Boy Scouts and the STEM Badges to the Girl Scouts.
5. *"rapid growth will require a large, steady and incredibly capable workforce with an eye for innovation. By investing in STEM education opportunities and promoting its importance to the younger generation now, the engineering \*surveying added\* industry will have a better chance of closing the skills gap in the future, which will aid in attracting and retaining the talent the industry needs."*

--Yvonne Garcia Thomas, Now is the time to invest in the next generation of engineers, San Antonio Business, September 24, 2020

#### **b. Commit to Diversity.**

1. It is clear that the land surveying profession remains critical and would benefit from attracting new and diverse members. The statistics mentioned above also reveal the sobering fact that, out of all 669 active P.L.S.'s in Nevada, only 14 are female. That is correct; only 2% of our current surveyors are women.
2. *Despite efforts to close the gender gap, women and girls remain underrepresented in STEM fields and in college STEM programs. While women make up half of the college-educated labor pool in the United States, they only account for 29 percent of the STEM workforce. The United States Bureau of Labor Statistics also confirms that African Americans, Latinos, and Native Americans are underrepresented in the engineering industry, where they represent only 22 percent of the workforce.*

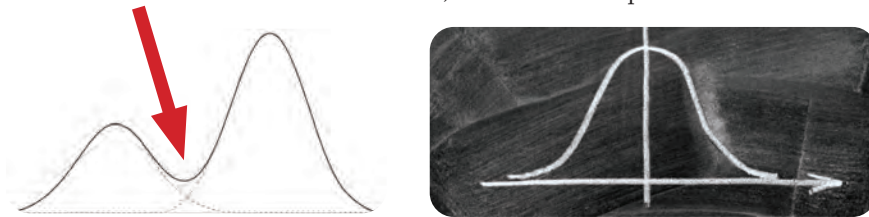
--Yvonne Garcia Thomas, Now is the time to invest in the next generation of engineers, San Antonio Business September 24, 2020

c. **Provide Mentorship.**

1. There is a growing need for industry mentorship opportunities, both in the profession and associations. I recently started Mentoring Mondays for the Land Surveying Profession, a weekly meeting room via Zoom for surveyors of all ages.
3. Create “Career Ambassadors” like the current program in North Carolina. I would like to see NSPS create a “school/training” for every Career Ambassador from across the country to learn about land surveying, learn how to present, and what tools to bring to a career fair or class presentation. One voice for all of us to preach.
4. Ensure we have a very active NSPS -Young Surveyors Network in your home state and nationally. I feel like the young surveyors could be the ones up in front of the class or the career fairs, bringing the energy and excitement we need to show off our best tools!

Suppose we can embrace the type of initiatives described above and successfully promote and market the land surveying profession. In that case, I feel there is real hope that we can pull the profession out of this “sag” point of what I hope is a Bimodal Curve. If we do not make any meaningful changes and simply rely on trends to correct themselves, we may well end up in the bell curve’s asymptotic tail. Together, we can reflect on the long and storied history of land surveying and take the steps needed to influence our profession’s future.

In an upcoming edition next year, I will follow up with another article that will provide an in-depth look at The Surveying Candidate Objectives for Recruitment and Education (SCORE) initiative, which is a regional pilot program to promote the geomatics profession. SCORE was devised by a coalition of surveying societies including the National Society of Professional Surveyors, Maryland Society of Surveyors, North Carolina Society of Surveyors, Surveying and Mapping Society of Georgia, Tennessee Association of Professional Surveyors, and Virginia Association of Surveyors. These organizations are working together to address recruitment in the geomatics profession—such as the recruitment of women and racial minorities, who are underrepresented in the field—as well as engineers who



may become dual licensees. In so doing, we can strengthen licensed professional representation in an evolving geospatial world. The coalition requested funding from NCEES to support the study and implementation of recruiting, marketing, and public relations strategies for the geomatics profession.

The NCEES board of directors fully supported the aims of the project and saw the need for this initiative not just on a regional level but also on a national level. Therefore, the board wanted NCEES to have more direct involvement and approved the development of a national marketing program to increase the number of licensed professionals in the geomatics field and for NCEES staff to work in conjunction with the National Society of Professional Surveyors and the coalition of state surveying societies to support the initiative.



# Are We Pushing On a Pull Door?

## *Steps to Change Our Land Surveying Outreach Efforts Moving Forward*

*Prepared by Trent J. Keenan, P.L.S.*

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Pushing on a pull door. Think about that saying for a second.... Those five words sum up our outreach efforts for the last 35-plus years. We continue to push on doors hoping people will invite us in. It is time for change. It is time for us to pull open the doors to create our own opportunities and secure the future of our profession. It is time to mobilize; get out there and pull open those doors to bring awareness to this great profession/career. We all can make a difference moving forward! In this article, we outline a few things to kick start our efforts.

The theme of the 2022 Western Regional Survey Conference was “Mapping the Path for the Next Generation.” It was a fitting theme for a profession that is eager for an influx of new talent and diverse voices.

At a conference Roundtable discussion dedicated to outreach efforts, passionate participants brainstormed ideas to move the profession forward and fill our thinning ranks.

When it comes to Outreach and attracting new talent to the profession, four clear avenues merit our time and attention:

1. K-5 students
2. 6-8 students
3. 9-12 students
4. Adults

While the conference’s theme focused on the next generation, individuals of all ages are interested in land surveying work. Here, we dive into the various avenues that can attract new talent to the land surveying profession.

### ***K-12 Outreach Initiatives***



Today’s students are talented and driven, and it’s important to introduce them to the existence of land surveying at a young age.

Exposure can begin at the youngest levels, tactics like fun coloring books, games, or toys with a surveying link.

The most critical time to bring awareness to the profession is in middle school, when students are old enough to be thinking seriously about the question “what do you want to be when you grow up?” but not yet decided on a career path. Suppose we can start the surveying conversation with elementary or junior high students. In that case, that awareness has the highest chance of carrying into high school and, therefore into students’ professional lives beyond.

But since every individual is different, you never know when the right activity or presentation at the right time will stick in a students’ mind and change the course of their professional life. Therefore, our best strategy is to develop a repetitive message that reaches all of the K-12 students at different stages of their journey.



## Deepen ties with existing programs

Getting involved does not necessarily require starting from scratch. There are an incredible array of existing programs that have a link to land surveying, which would be in our best interest to explore and invest in further.

### Here is a collection of current programs:

#### Get Kids Into Survey



Get Kids Into Survey was established in 2017 and uses comics and other age-appropriate content to connect children with the world of surveying.

Brand ambassadors can get involved with Get Kids Into Survey in order to support their local communities. Anyone can become a Brand Ambassador – all you need is a passion for the industry and for educating the next generation.

Find out more about GkiS or become a brand ambassador at: <https://getkidsintosurvey.com/>

#### GeoBus



Pioneered by the University of Central Florida, the GeoBus is a 40 foot retrofitted city bus with a solar-powered learning lab meant to inspire science's next generation in Science, Technology, Engineering, Arts, and Math (STEAM). The mobile laboratory is focused on maps, apps, and drones and visits K-12 schools, community centers, and events.

While UCF's GeoBus operates only within the state of Florida, the concept is an exciting one. The program could easily be expanded or replicated in other areas of the country. Be sure to follow the GeoBus at: <https://story-maps.arcgis.com/stories/a9790220342b45b18e89ad306f780b74>

#### Trig-Star



Sponsored by the National Society of Professional Surveyors, Trig-Star is a math-based competition that recognizes and rewards high school students who excel in mathematics, particularly Trigonometry, and their teachers. The program's goal is to demonstrate practical uses for mathematics and bring greater awareness to the surveying profession. Current surveying professionals can get involved by administering a Trig-Star Exam.

During the WRS conference roundtable, an important point was raised: math students are likely to be interested in the surveying profession, but so are history students. Developing a history-based survey program that targets a new subject area could prove valuable. Find out more about Trig-Star at: <https://trig-star.com/>

#### Scout troops



Boy and Girl Scout troops are a natural target for surveying outreach because of their love of the great outdoors and hands-on activities.

Currently, there is a Surveying Merit Badge that Boy Scouts can earn. However, it is presently one of the least-awarded merit badges and is at risk of being sunsetted. One issue is that the badge takes a full day to complete, which is less tempting for scouts who can earn multiple badges in a day for different activities. The badge is in need of revision and funding if it is going to make a continued impact. Scoutmasters often don't know who to ask to guide scouts through earning the badge. This is where surveyor volunteers could help tremendously.

On the Girl Scout side, STEM badges help girls build valuable technology skills while exploring scientific topics. One of the best ones to start with would be either the Junior Geocacher Badge or the Cadette STEM Career Exploration Badge. These badges could be used to promote from a surveying standpoint.



- **Naturalist** badges invite girls to explore the outdoors.
- **Digital Art** badges help girls build valuable technology and computer skills.
- **Science and Technology** badges connect girls to favorite science topics like video game development, the physics of roller coasters, and the technology used to create new fabrics.
- **Innovation** badges encourage problem solving using scientific methods from fields like anthropology, engineering, graphic design, and business.
- **Financial Literacy** badges prepare girls for a financially sound future.

Annual events like the Boy Scout National Jamboree also lend themselves to opportunities for presentations, activities, and earning badges related to surveying. NSPS is currently seeking volunteers to attend the next Jamboree and offer the Surveying Merit Badge. Similar events likely exist where Girl Scouts and the STEM badges can be targeted.

<https://jamboree.scouting.org/> & <https://www.girlscouts.org/en/footer/press-room/2017/23-new-stem-outdoor-badges-enrich-programming.html>

#### *Future City*



The Future City Competition is a project-based learning program where students in 6th, 7th, and 8th grades imagine, research, design, and build cities of the future.

Surveying is an important part of designing environmentally-friendly futuristic cities, yet it's currently not embedded in the Future Cities competition as well as it could be.

Currently, surveyors can get involved as judges of the event. The opportunity to increase exposure lies in increasing our involvement prior to the final competition day, and making sure that students fully understand the surveying component of the project and how their project will be judged.

When surveying is an abstract line item of the rule sheet, it's not compelling. However, many Future City coordinators are more than interested in the concept of having surveyors come to present to their students during the planning process so that they can incorporate new knowledge into their Future City projects.

Become a mentor: <https://futurecity.org/about-the-competition/forming-your-team>

#### *SkillsUSA*



Another middle school-focused program is SkillsUSA. SkillsUSA is a national nonprofit made up of a partnership of students, teachers, and industry working together to ensure America has a skilled workforce.

Currently, surveying is not represented as part of the SkillsUSA program, but it would be an excellent fit. The group has both an educational component and a skill component, which is used to introduce and train students in various vocational professions.

Find a locate State Association Director in your area: <https://www.skillsusa.org/about/state-directors/>

#### *CTE (Career and Technical Education) for High School*



Career Technical Education (CTE) provides students of all ages with the academic and technical skills, knowledge, and training necessary to succeed in future careers and to become lifelong learners. In total, about 12.5 million high school and college students are enrolled in CTE across the nation. CTE prepares these learners for the world of work by introducing them to workplace competencies and makes academic content accessible to students by providing it in a hands-on context. In fact, the high school graduation rate for CTE concentrators is about 90 percent – 15 percentage points higher than the national average.

Find a CTE in your state: <https://careertech.org/cte-your-state>

#### *Project Lead the Way (PLTW) for High School*



##### *Reinventing the Classroom Experience*

Project Lead The Way provides transformative learning experiences for PreK-12 students and teachers across the U.S. They create an engaging, hands-on classroom environment and empower students to develop in-demand knowledge and skills they need to thrive. The professional development for teachers provides training, resources, and support to engage students in real-world learning.

PLTW Engineering empowers students to step into the role of an engineer, adopt a problem-solving mindset, and make the leap from dreamers to doers. The program's courses engage students in compelling, real-world challenges that help them become better collaborators and thinkers. Students take from the courses in-demand knowledge and skills they will use in high school and for the rest of their lives, on any career path they take.

A recent study shows PLTW students outperform their peers in school, are better prepared for post-secondary studies, and are more likely to consider STEM careers, compared to their non-PLTW peers. Students find PLTW programs relevant, inspiring, engaging, and foundational to their future success.

Find the Project Lead the Way School in your area: [https://www.pltw.org/experience-pltw/school-locator?search\\_school=&state=NV](https://www.pltw.org/experience-pltw/school-locator?search_school=&state=NV)

## ***FFA – Future Farmers of America***



FFA is a dynamic youth organization that changes lives and prepares members for premier leadership, personal growth and career success through agricultural education.

FFA develops members' potential and helps them discover their talent through hands-on experiences, which give members the tools to achieve real-world success.

Members are future chemists, veterinarians, government officials, entrepreneurs, bankers, international business leaders, teachers and premier professionals in many career fields.

FFA is an intracurricular student organization for those interested in agriculture and leadership. It is one of the three components of agricultural education.

The official name of the organization is the National FFA Organization. The letters "FFA" stand for Future Farmers of America. These letters are a part of our history and our heritage that will never change. <https://www.ffa.org/>

To read about a recent success story using the FFA as a platform, check out the Tennessee Association of Professional Surveyors (TAPS) Spring 2022 Newsletter - Presidents Report by Andrew Stokes. TAPS set up an exhibit booth at the 94th Annual State Convention in Gatlinburg, TN, and was able to grab the attention of hundreds of kids over a two-day convention. In total there were 3200 people in attendance and they were able to have almost 500 sit down and watch their 3-minute video about a career in surveying.

[https://www.taps-inc.com/mediafeed/search?ext=pdf&keyword=&type=application/pdf&folder=4&page\\_title=Newsletters&sort=created\\_at&sort\\_reverse=true](https://www.taps-inc.com/mediafeed/search?ext=pdf&keyword=&type=application/pdf&folder=4&page_title=Newsletters&sort=created_at&sort_reverse=true)

Overall, many of the above programs would benefit from "Career Ambassadors:" surveyors who are trained to present at events like Trig-Star and educate students for competitions like Future City. One thought is to have state land surveying associations create learning centers to train such ambassadors, who would then be prepped and ready to jump into various events and spread surveying awareness.

## ***Become an Industry Partner***

Career programs are effective because of local industry partners also contribute to student learning through mentoring, curriculum development, site visits, internships and other workplace learning experiences being presented in class. They will also sometimes lead to paid internships for students. These collaborations will provide mutual benefits for students and employers, by providing high-impact learning to students and opportunities for employers to recruit diverse students. By hosting a student intern, it is not only an investment in the future workforce, but also an opportunity to provide work-based learning opportunities for students that will create value and benefits to your organization in numerous ways:

A few ways becoming an Industry Partner will help you are:

- Increase your visibility for recruitment.
- Connect with career-minded students.
- Diversify with new, motivated team members.
- Contribute to a vibrant local workforce.
- Build a Foundation for long-term relationships.
- Becoming trusted resource for network members.

## ***Present at schools and fairs***

A less formalized by equally valuable way to reach students is by presenting in schools and hosting booths at career fairs and events. One of the essential parts of a presentation is bringing the right tools to the presentation. Know who your audience is, and know that you need to stand out amongst the rest in order to keep their attention.

### ***School Presentations***



The vast majority of schools would be thrilled to have surveying professionals get involved with students and conduct presentations. The problem is they have no idea who to reach out to. That's why surveyors need to take the first step and volunteer our team. Often once you make your availability known, educators will be knocking down your door with opportunities.

For elementary school students, presentations and talks can be simple. How did a road get paved? How did the house or apartment building that a student lives in get built? Illustrating the surveying component of the process can be fun for young school children.



As mentioned above in the Trig-Star section above, middle school history classes could be a prime group of students to target when it comes to surveying awareness. Documentaries often feature surveyors. An interesting exercise would be to compile short clips from various documentaries and send them to schools or show them as part of a speaker presentation.

One powerful message would be to send brand-new young surveyors into the high school classroom. Some of our profession's younger surveyors were in the shoes of high school students only a decade ago. Hearing how surveying has shaped their early career may be even more powerful than hearing about the successes of a senior surveyor.

### ***Career Fairs***



School career counselors also need to be brought into the loop to understand what surveying is and how to feature it to the students they serve.

There are opportunities to present to school counselors at conferences and seminars or send written pamphlets and content for them to file in their offices.

We need to emphasize the role of surveying in buzzy fields like environmental waste and climate science that are attractive to young students and the innovative technology students would be using in the profession.

### ***State & County Fairs***



One conference participant started a casual conversation with a STEM teacher that turned into a 2-hour conversation about opportunities to bring surveyors to STEM Fairs. The very next week, he had four schools calling him asking him about coming to judge.

Other conference attendees had just finished taking shifts at a surveying booth at the Minnesota State Fair, one of the largest state fairs in the world.

Having your state association at these fairs is a great opportunity for exposure. The attendees took turns taking 4-hour shifts and showing off a sandbox. It attracted children and adults alike.

In Nevada, there are similar plans to bring a sandbox to the Nevada State Fair in June. And at a recent Nevada STEM event, a joint booth shared with ACEC featured a surveying comic book, stickers, and posters to promote the profession.

### ***Tap into non-traditional education***



Traditional K-12 often gets the lion's share of volunteering and attention, but a focus on alternative high schools and homeschooling could also be extremely beneficial.

For example, UCLS recently paired up with an alternative high school to run a drone program. The students are now graduating with the ability to fly drones with LIDAR pucks in them. They're doing it for fun, but they don't even realize that the world of surveying exists. If we are able to tap into and educate students in unique programs like that, it's an opportunity worth jumping on.

Charter and Waldorf schools are other alternative schools that often prize hands-on learning. Often they have smaller, more focused classes with kids who are more engaged than a cafeteria presentation at a public school filled with a hundred students.

Meanwhile, there is a national umbrella for homeschooling. Homeschooling presents an avenue that has never really been examined. Parents may be interested in surveying curriculum from two perspectives; both the historical perspective and the modern technology perspective.

Once conference attendee formerly volunteered with a parochial school and met with students for two hours per week for one semester. The two hours would be spent teaching students about surveying skills such as drafting. Today, you could easily do the same thing covering drones and more exciting modern topics.

### ***Provide professional opportunities***

Finally, suppose you run a company and are serious about filling your ranks with new surveyors. In that case, you should strongly consider fleshing out programs like job shadowing, internships, and educational boot camps.

## Job Shadowing & Internships



Consider giving students the opportunity to experience the day in the life of a surveyor firsthand. Bring them along in your truck, and have them sit next to you at the computer. Let them see the ins and outs of a real day in order to see if it's interesting to them.

Job shadowing also doesn't have to be just for K-12 students. It's also a good opportunity for people who are looking to switch careers and aren't sure what to do next. Our surveying chapters could easily undertake Outreach to companies who would be willing to set up job shadowing programs.

Internships are the next logical step up from job shadowing. If students are still interested in learning more after shadowing you, hire them for a summer internship so they can experience doing the work themselves.

Target your local community colleges if high schoolers don't seem ready to take on an internship. One attendee's company has hosted interns for the entire summer, where they were cross-trained between the field and the office.

## Summer & Bootcamps



### **SURVEYING TECHNOLOGY Summer Camp 2022**

An exciting first-time boot camp is taking place this summer at Vincennes University in Indiana. A teacher in the program has created a three-day summer boot camp for kids. Day one will be an introduction to surveying. Next, it will cover field notes and then pacing.

From a society standpoint, boot camps could be set up regionally and run for one week, with parents able to drop off their middle school students and head to work. Surveying volunteers could donate a day or two of their time to help run the camp and educate participants.

Another option would be a bite-sized weekend camp or camping trip.

## Advertise to all ages



Stepping up our K-12 education and outreach efforts will take something that's new to most surveyors: advertising. Specifically, reaching young people on the platforms they use most, with content that resonates with them.

We will need to create modern, fresh, and eye-catching content to link exciting professional work like drones, helicopters, high-rise buildings, and climate science with land surveying. Today's surveying work goes far beyond property boundaries, and it's time for us to let the world know it.

This will likely mean doing things like:

- Hiring a professional marketing firm
- Creating a national logo for the surveying profession
- Updating videos like the ones on [landsurveyingcareer.com](http://landsurveyingcareer.com)
- Getting active on social media
- Taking professional photos and footage
- Using hashtags effectively

It will take communal action to begin speaking with one professional voice and creating valuable content that can be cross-promoted and used by different regions. But it's a critical step that will move our profession forward.

Roundtable attendees left the outreach session planning to pool financial resources between 13 western states, create a new video, and build up a budget for additional assets.

It's clear that social media videos like those popular on TikTok are extremely short and have a clear hook that draws viewers in. New advertisements and sponsored content for the Young Surveyors Network should follow this same philosophy.

Perhaps it's also time to supplement our photo collections full of rocks and trees with more interesting content like Go-Pro footage of the day in the life of a surveyor, or a time-lapse of a project from beginning to end.

In short, we need to work on our professional branding. It needs to be visual, compelling, and speak to our target audience: those who don't know anything yet about surveying.

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## ***Adult Outreach Initiatives***

Students in the K-12 range aren't our only target audience when it comes to recruiting new surveyors. In fact, there are many qualified adults seeking career changes and who may already possess some of the building blocks of survey knowledge.

### ***Ex-Military***



Every day, individuals phase-out of a career in the military and find themselves ready for a new profession. There are existing programs like Helmets to Hardhats and Hiring Our Heroes that seek to do this very thing.

We should look to create our own such program for the land surveying profession (one attendee mentioned the same "Service to Surveying.")

Since the end of the conference, the California Land Surveyors Associations (CLSA) has already started working on this program and the Nevada Association of Land Surveyors (NALS) will be joining in on this initiative. Both CLSA and NALS are looking for members who are willing to mentor military personnel and provide them with guidance to a successful future. If you are able to help, please reach out to either [info@californiasurveyors.org](mailto:info@californiasurveyors.org) or [nals@nvlandsurveyors.org](mailto:nals@nvlandsurveyors.org).

The key to attracting military hires is by working with the recruiting firms and transitional career counselors that servicemen and women meet with when they separate from the military.

That is the stage where we need to make land surveying awareness happen. We need to establish a liaison between army bases and surveying professionals so that interested candidates can get information and transition quickly.

The best person one attendee hired last year was an ex-army serviceman. A former major, he was extremely disciplined and had a background in geospatial work.

The army reserve is another untapped market, with workers who are eager to fill in empty time and gain access to the gear and equipment they need.

The only caveat with military hires is that often, they can make more money in other fields rather than start from "zero" in the surveying profession. The more we can help them capitalize on making a career in survey quicker, the better.

### ***General Adults***

What are the characteristics that make up a good surveyor? It's a question we posed at the Outreach Roundtable event. Here are some of the answers:

- Serious
- Engaged
- Inspired
- Hardworking
- Disciplined
- Accountable
- Humble
- Confident
- Honest
- Curious
- Inquisitive
- Team player
- Strong communicator
- Critical thinking skills

Surveying is often portrayed as a physical job based on literal manpower. Yet many adults, including many women, are extremely well-suited to the life of being a surveyor.

We need to start thinking about not just how we advertise the profession, but how we make it a welcoming one for women and minorities.

In terms of advertising, we should showcase the diversity that is possible within surveying.

Instead of just showing surveying equipment in professional brochures, we should show more people. Instead of emphasizing the physical labor and the construction side of surveying, we should also emphasize the educational aspects.

And when out in the field, we should do things like let women carry their own equipment and act like identical members of the team, according to one female conference attendee.



Finally, to attract new adults we also need to provide flexibility and convenience when possible, and provide decent health benefits so that we can attract and retain good employees.

### *Getting Surveyors Involved*

Outlining these incredible outreach opportunities is one thing, but executing them is another matter. In order to tackle some of the initiatives brainstormed above, we need active surveying professionals to step up to the plate.

#### *Join your local outreach committee*



Are you a member of your local state society, Young Surveyors Network, outreach committee, or workforce development committee?

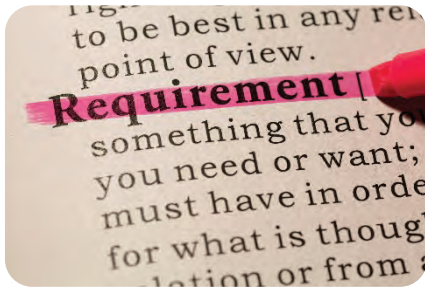
Not all surveyors have easy access to leadership roles and committee activism. Some states and regions have thriving professional groups, and other areas hardly have any to speak of, or are begging for volunteers behind the scenes.

Whenever possible, we should make our societies more inclusive. For example, consider changing your bylaws to include more voting members in your state society and encourage more involvement at the chapter level.

Information should be clear and standardized so that committees aren't operating in silos and interested professionals know exactly who to reach out to get involved in their chapter or apply for a board position.

The best way to take action is to get started. Join your local outreach committee, or ask about forming one. It requires energy, but positive momentum is contagious. It's more than possible to change a lackluster outlook on Outreach. It just takes determined individuals ready to spark change.

#### *Make outreach efforts a requirement*



This may sound controversial at first, but one surefire way to increase outreach involvement in the surveying profession is to make it a requirement.

Consider that many surveyors attend conferences in order to accrue professional development hours. Yes, attendees learn, have fun, and benefit from the conference seminars. But sometimes, they show up in the first place because it's a professional requirement.

The same philosophy can be used to establish a culture of Outreach, just like we use required PDH to establish a culture of continued learning.

For example, Nevada has a new law that requires two hours of ethics and one hour of state statute update education per year. A change to the NAC administrative code was all it took.

If every professional surveyor was required to have a certain number of mentoring hours per year as a licensing requirement, it would immediately boost outreach efforts.

Yes, it would rely on the honor system. And yes, nobody likes to be "volun-told" what to do. But it's also true that what starts as a requirement can be the boost someone needs to form a rewarding habit. And there's no doubt that Outreach and mentorship are some of the most rewarding activities there are.

We also brought up this very topic in a recent Round Table Tuesday session. We discussed the options of being able to apply a few hours of Outreach to our continuing education requirements, as we do for writing an article or presenting at our conferences. Again, I think this is something we should bring to the attention of each licensing board!

### *Quick - Road map on how we get started with the school students*

#### **First step:**

Create a presentation for each grade school level. We need to tailor our speeches to our audience. Develop a presentation for kids in K-5<sup>th</sup> grade (elementary school). Then one for 6<sup>th</sup> to 8<sup>th</sup> grade (middle school) and one for 9<sup>th</sup> to 12<sup>th</sup> grade (high school). We need to create two separate presentations for both the middle school and high school, one for math students and one for history students.



We also need to develop an entire road map for each state for a path from elementary school all the way through college graduation and onto completing the state licensure exam.

### Second step:

Start writing letters and reaching out to the schools and introducing yourself. See if there is an opportunity to speak with the students in any of the science, technology, engineering, history, or math classes about a career in the land surveying profession. Once you have the connections, start scheduling your presentations.

Another option for a second step would be getting out to all the school counselor's conferences. Both in your local state and on the national level. We need to let the counselors know about our profession, so they can promote it to their kids. If they do not know about our profession, they can not help us promote it.



### Third step:

On the day of your presentation, bring the young surveyors with you and bring the best tools you have. Bring the largest drones you own, the 3D scanners with a laptop presentation, the robotic total stations, etc. You need to grab the students attention and hook them with the tools and make sure they are aware they are coming into a profession that uses the latest and greatest technology.

**Side note:** Make sure you create a repetitive message and hit the same schools repeatedly; make sure you also know which elementary schools feed into the middle school and then feed into the high school, so you hit the same kids repeatedly.



# The Importance of Workforce Development:

## *Why It is Critical & a Few Ideas to Help You Get Started.*

*Prepared by Trent J. Keenan, P.L.S.*

*Reprinted with permission of the Nevada Land Surveyors Association, Nevada Traverse, Issue 49.2 [www.NvLandSurveyors.org/nevada\\_traverse.html](http://www.NvLandSurveyors.org/nevada_traverse.html)*



*At the 2022 Western Regional Survey Conference, multiple panels focused on brainstorming the best ways to train and support employees using workforce development and this is an abstract article based on these discussions.*

It's common knowledge in the surveying profession that new talent is hard to find. That's why in addition to attracting new talent, we need to be focused on another critical task: keeping existing talent.

Keeping existing talent doesn't just mean retaining your existing staff roster for decades. It means keeping employees in the world of surveying and not losing talented individuals to related trades or industries such as construction and engineering.

The recent downturn was particularly damaging to surveying because we didn't necessarily lose licensed surveyors. Instead, we lost an enormous chunk of the ecosystem that supports surveying: the technicians and all of the other bodies who help us do our work on a daily basis.

Workforce development is the effort of engaging, supporting, and further educating existing employees. When most of today's land surveying firms are made up of less than five employees and another huge number have less than nine employees. The more that employees feel supported in both the short term (such as current project demands) and the long term (such as opportunities for advancement and growth), the more likely they will be to stay in your company and in the profession.

Undertaking workforce development can take many forms, and there are many tools already at our disposal. At the 2022 Western Regional Survey Conference, multiple panels focused on brainstorming the best ways to train and support employees using workforce development. Here are the major strategies that were discussed.

### *Types of Training*



Perhaps the biggest undertaking of workforce development is training. The word "development" implies learning new skills and improving the status quo.

Does your company currently offer training to develop employee knowledge? If you have to think about it, you probably have to improve it.

The first step is simple but critical: *schedule time for it.*

It's all too easy to acknowledge the importance of training in theory, but refuse to make time for it in practice as more time-sensitive daily demands arise.

One survey company mentioned that their administrator plans the entire year of training in advance. She sends out calendar invites for all training sessions in January, so it's set in stone and there is no room for surprise conflicts. In other words, the training comes first, and everything else is scheduled around it, meaning it's impossible to put off.

Training should also be diverse in nature, as not everyone learns in the same way. Taking tests is far from the only way to learn. Good workforce development is more about investing time in learning, in all of its many diverse forms. Below are a number of training opportunities to consider.



## Onboarding training

Onboarding new employees is a prime time to train them in a wide variety of topics and procedures.

Every company is unique, so onboarding may be an ideal time to not just onboard them to how your company works, but to introduce employees to skills valuable to your specific workplace.

For instance, a new field crew employee has probably never seen a legal description in their life, but it could be a skill that your office finds meaningful to have as a survey technician.

When employees are equipped to succeed in your specific work environment, they'll be empowered to know they're doing their job well. If you can provide training that lets new employees succeed from the start, you'll be getting off on the right foot.



## Cross-training



Once employees get a handle on their own role, cross-training can be a valuable training effort for many reasons. In fact, cross-training can be done for almost any employee, at any stage in their career. A deeper understanding of how the company works as a whole can only help people have a greater appreciation for their coworkers and perform their jobs more efficiently.

Do you allow your office staff to go into the field? Have you ever had field staff come into the office? It can be an illuminating experience that enriches the knowledge of your employees.

For example, your field staff can recognize the issues that they can face on a job site because they do it every day. But office staff may be fairly ignorant of job site operations. There's often a big communication gap between the office and the field. Cross-training can help bridge that gap.

Cross-training within both field and office roles is also valuable. For example, what happens when someone goes on vacation? Is there someone else at your company who knows how to pick up the slack? When you only have one person trained to do something, you're setting yourself up for painful situations.

One fun idea is to get creative with your office seating.

One employee described starting as a field employee before he got pulled into the office. He never moved desks, so he stayed in the "field" section of the office. Then, a new GIS hire was also placed in the field section of desks due to space issues.

It ended up being an incredible opportunity. Office, field, and GIS team members could all collaborate and problem-solve in real-time. The GIS employee had two surveyors sitting right next to him, so he learned how to do his job well. It's a good argument for mixing up your seating and putting different employees together so that cross-training can happen naturally.

## Safety Training



Safety is a non-negotiable type of training that should occur on a regular basis in your office.

The surveying profession is guided by countless safety measures like wearing steel-toed boots and conducting safety checklists. But not everyone follows these best practices.

While employers are responsible for ensuring workplace safety, employees are also accountable for following standard procedures and employing common sense while on the job.

The truth is that surveyors perform work that often puts them at risk. Working in roadways, handling equipment, and time spent outdoors can result in accidents or injury if you're not careful. Sometimes companies take a proactive stance on safety, and sometimes they don't.

At the chapter levels of an Association, it used to be more common that we would hire safety experts to come and provide presentations. It's a practice that we should pick back up.

Safety training can also connect back to the importance of cross-training. For example, one survey firm works with Right of Way agents who are often called upon to go out in the field. The Right of Way agents often borrow a company vehicle to drive to job sites.

It's important that such staff know things like:

- What type of vehicle to check out
- Where to park
- What footwear is appropriate
- What conditions to expect on the site
- What to be aware of and watch out for

For example, many surveying employees quickly learn the phrase “leaves on a tree are not TP.” It’s a humorous phrase, but in the winter, there are no leaves on poison oak stalks. An unsuspecting and untrained employee may not recognize it and walk right into it.

Others may not be aware that on many construction sites, there are “all-road” directions that may change periodically. Job site awareness and safety refreshers are always helpful.

*As a side note: I will have an entire article devoted to Safety coming out in an upcoming Nevada Traverse this year and it will hit on this topic in more detail.*

### ***Expert Presentations***



You don’t always have to do the heavy-lifting yourself when it comes to training. What better way to train your employees in specific topics than to bring in the experts?

Many of your local vendors can conduct excellent training. In addition, consider contacting a groups like Monsen Engineering, Allen Instruments, or even Frontier Precision, who have training materials ready to go for their own employees and would gladly be hired to share it with your team.

Many vendors have many resources and skilled presenters, some of whom are even licensed land surveyors.

One surveying company that has about 50 employees and 10 field crews has regularly hired an outside safety consultant to start conducting monthly safety meetings. It’s worked out well for them and ensures that topics are relevant and fresh. Special topics have included confined space work and other topics.

### ***Internal presentations***

Another equally effective idea is to assign employees to do presentations.

This has the benefit of sharing internal knowledge and improving employee communication skills at the same time. When you set up such programs to be safe and non-threatening, it can result in great content and participation.

About 10 years ago, one survey company set up a program where on the first Tuesday of every month, employees could come to work one hour early and learn from an employee in another department. They noticed that employees were excited and energized because they could now do their jobs better. For instance, the company’s surveyors pretty much knew how to layout a septic system, or knew why you needed to get more topo on some roads. But to hear it from an engineer with a different perspective changed their mindset.



You’d be surprised how much knowledge you already have internally that isn’t tapped into to its fullest potential. And when you ask someone like an engineer or project manager to share their insights, they get to enjoy being put on a pedestal for a moment and feel like a valued expert.

Another company started a program called “Paycheck Problems.” Every payday, they have a meeting where they’ve assigned one employee to discuss a surveying problem. It happens like clockwork every two weeks and creates an atmosphere that values training, learning, and problem-solving abilities.

A former BLM employee described how they would hold regular cadastral technical sessions. One week every month, they would bring everybody into the office together and everyone would put together some sort of presentation on either a job they’ve worked on that had a particular specialty or even do a mini-research project digging into the manual or past court cases.

### ***Life Skill Training***

It is also important to remember that your employees are people. They have interests and concerns that are not strictly survey-related. It can be fun and helpful to also provide training on company benefits or even life skills.



One Surveyor recalled how their favorite former employer held trainings on topics like personal finance, how to buy a diamond engagement ring, and how to change the oil and properly maintain your car.

Other companies have annual trainings with their benefits administrators to refresh employees on their benefits package and go over any updates. Financial presenters explain the benefits of a 401k and urge everyone to contribute to get the free employer match.

Such topics provide holistic value to employees that help them beyond the office environment and aid in their personal growth. Such gestures also show that you care, and are wanting to invest in them as human beings.

## Mentoring Mondays



Another done-for-you training opportunity that all surveyors should know about is the Mentoring Mondays program. It's exactly what it sounds like: every Monday, attendees from anywhere in the country can join a Zoom call and hear a presentation from an expert on a topic related to surveying.

The program is meant to fill the gap for smaller companies with five or fewer employees who have less opportunity for formal training programs and mentorship opportunities.

When you from within the surveying industry, your opportunities for knowledge sharing become even richer and more diverse.

Round Table Tuesdays is another opportunity run by the Indiana YSN group. Geared towards those new or entry-level to the profession, the monthly meetings are not limited to SITs or PSs, but rather aim to provide value to technicians and field crews as well. Speakers and topics are primarily focused on Indiana, but all are welcome to join.

Other resources like, Kent Groh's Geoholics podcast, and the Surveyor Says podcasts are all additional resources to consider. It's amazing what you can learn from even just recorded podcasts.

One surveying team downloads the newest podcasts and listens to them in the truck on the way to and from the job site each day. It's certainly a better and more productive use of "windshield time."

This new program just started up in May 2022 called Wisdom Wednesdays and the background behind it is to be a book club with a round table discussion about each chapter of our "land surveying bibles." The program will be starting off with one of our bibles called Evidence and Procedures for Boundary Location. Be sure to follow all of the social media accounts for the programs listed above.



## Conferences



A final obvious training resource is promoting attendance at your state association conferences. Encouraging your younger field staff to come and engage in conferences can work wonders to increase their knowledge and perspective of the profession.

Conferences are naturally well-organized, feature expert speakers, allow for stimulating discussion, and get your employees out of their normal routine to see the bigger picture of the surveying profession.

As a standard theme moving forward, all state conferences would be wise to have a technician track in order to be more inclusive and get rid of the pressure to become a professional land surveyor if that's not their goal.

It's true that conferences can be pricy to attend with all the travel and paid time off to attend. So when it's not always feasible, why not send one or two people who would benefit the most, and assign them to present back to the rest of the company on what they learned?

## CST & Part 107



In addition to training, there are other ways you can help support employees to envision and enrich their careers.

If your surveying employees are getting serious about the next step in their professional lives, educating them on the CST track can be a valuable move.

The CST allows employees to embark on a series of smaller exams that will potentially culminate in them taking the more difficult FS and PS exams. The CST is a valuable training ground that will require them to come up with a structured study plan.

The FAA Part 107 is another option.



To support employees interested in the CST, Part 107, or other exams, you can create a support system such as a Saturday study group for employees.

### ***Set Goals***

To help motivate employees from the inside out, you also need to demonstrate that you're there to help learn and support their professional goals. Doing so will help to illuminate the paths available to employees, and help you as an employer to connect with them on a deeper level.

Some of your younger employees may not be sure what goals to set, while other employees will be vocal and ambitious about their goals. It's important to help employees imagine where they want to be several years down the road, and then chart a path that empowers them to get there.

For goals to be successful, you should have employees write them down formally and revisit them at least once or twice per year. Break down big goals into more incremental parts to make progress seem less overwhelming.

If an employee wants to be a licensed surveyor, have them start with CST level one and then work their way up.

Salary is always a great motivator. You can provide employees with six-month goals that are tied to \$2/hour incremental raises, for instance.

Inspiring stories can also help them understand the type of career change that is possible—such as how you went from \$5.25 per hour to owning a land surveying business by doggedly setting your own goals and pursuing them.

### ***Create Feedback Loops***



Understanding how they are performing in real-time each day can also help employees improve their skills and analytical thinking.

How often are you taking the time to provide feedback on daily performance? When you ignore the same small errors over and over, you do a disservice to your employees versus when you constructively take time to call them out.

For example, one surveying company found that their engineers would tend to design things that didn't make a lot of sense when they were staked out on the ground. So they started doing something new: when a new job would come in for the field crew to tackle, they would identify the engineer who designed it and bring him or her to the job site. Then, they would have the engineer personally stake it out—in this case in the 105-degree Fresno heat.

When wondering why the staking was so hard, it would become clear to the engineer that their design needed to be improved. Thanks to the job-site feedback, the next design was much better, and the one after that was even more improved.

This type of educational feedback helps employees understand not just what they need to do, but why. It empowers them to take on the next project with more confidence, anticipate the needs of the client and their teammates, and provide a better internal product overall.

Consider starting by having your field staff come into the office to draft up the topos that they just shot, in order to improve the way the field staff operates for the benefit of the office staff. It will make employees do better in the field by helping them understand what, why, and how they're shooting certain things.

Learning from mistakes is critical and will help employees understand how to make the right decisions and avoid the wrong ones—avoiding potentially costly mistakes in the process.

### ***Hone Communication Skills***

An underrated skill that you can encourage employees to develop are communication skills. In many instances, the very first contact that landowners have within a given project is with the Surveyor. If communication starts off on a sour note, the chances are that interaction will impact the whole project.

Good communication doesn't mean that you need to know everything about every project. It just requires a general level of good articulation so that you represent your firm and profession well.

One Surveyor told a story of a staking project that was intended to lay out alternatives routes to a proposed highway project. The final route had been decided, but mapping out alternatives was a requirement. A landowner saw the staking in action and came out



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of their home to ask what the surveyors were doing. One of them said, “we’re doing survey work for a highway project that is going through here. Which house is yours?” He told the homeowner that the centerline of the highway was going to go right through their property.

While most examples of poor communication aren’t so severe, it’s clear that coaching on communication is valuable.

Another surveyor who worked for BLM described how the senior Surveyor he was working under was instructing him on how to talk to public landowners. The older Surveyor would explain in detail why he approached conversations with landowners in specific ways. Then, when the younger Surveyor was out on his own talking to prickly landowners, he was able to be deliberate and thoughtful about how he explained things to them.

Honing communication skills can take the form of mentoring, but you can also encourage public speaking training such as Toastmasters.

If you want to set a positive example, don’t be afraid to jump in by enrolling yourself. One Surveyor signed up for a 4-week boot camp in order to set an example for his staff. Even more mature professionals can benefit from going out of their comfort zone and facing the critiques of programs like Toastmasters.

### ***Treat Your Staff with Respect***

Finally, one of the best ways you can impress your staff is by treating them like human beings and respecting the unique dynamics of their lives.

Many of us grew up in an era of putting hard work before everything else. But the demands of the modern world have changed, and so have modern worker expectations.

Setting the right professional expectations about work-life balance can help employees feel like they don’t have to do it all—they can balance the demands of a sick child or personal obligations with their work.

You’d also be surprised what employees will share with you if you give them an opportunity to open up. For example, one Surveyor noticed he had an employee struggling to get to work on time every morning. It turns out that his family only had one car. He solved the problem by letting the employee use a company truck. It took an incredible burden off of the employee, and showed that his employer cared.

Today’s workforce wants to feel valued and have an element of being autonomous. Why not let employees head home from the job site, and email their data back to the office via VPN? As long as you get the results that you need, it may be less critical that all work happens from the confines of the office.

Competitive pay is also important, but remember that it’s less about pure salary and more about overall compensation. If you offer a full suite of benefits, communicate the value of those to employees. Everything from fitness budgets to charitable donations makes up the total compensation package. That said, be sure to conduct annual salary increases and raises that take into account inflation and the rising cost of living.

There are many factors that can help develop our existing workforce, and they are all things that can be implemented in our individual surveying businesses to varying degrees.

If nothing else, remember that employees want a mentor and guide who will pass on their expertise. When we ensure that knowledge is shared and employee voices are heard, we can rest assured that we will retain the current generation of surveyors who are already under our care.



# Saving Surveying: What Does It Take To Get People Involved?

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*An abstract of a Mentoring Monday's presentation from March 1, 2021*

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In almost every state, the number of licensed surveyors is dwindling in comparison to the number of surveyors who are projected to retire in the coming decade.

In Alaska alone, over 12% of surveyors will disappear from the ranks in the coming years. While a short-term viewpoint might celebrate more work and higher wages for the surveyors who remain, from a long-term standpoint, the situation looks grim.

Surveyors are a passionate bunch. Many surveyors who “retire” can’t seem to stay entirely out of commission for long. It’s the type of passion that results in a thirst to pass down knowledge and wisdom to future generations. So how can we ensure that enough hands will be ready to take up the reins?



During a recent Mentoring Mondays, surveyors in attendance brainstormed the challenges and hurdles facing the profession.

## ***Balancing academics and experience***

Michael Schoder, PLS and retired BLM Chief Cadastral Surveyor for Alaska is concerned about filling the surveying ranks.



He thinks that the solution to the dilemma likely lies in creating a system of mentoring.

While the University of Alaska has a strong geomatics program for surveyors, including a dedicated cadastral track, Michael doesn’t know if education alone can inspire and prepare the next generation of surveyors.

“The problem is that in my view is that you can’t do this all with academia. And I think once we said, hey, well, it’s a four-year degree. Great. We can train them. Now I can back off. I don’t have to mentor them. I know when I get somebody out of one of those programs, they’re going to have some basic knowledge,” Michael said.

While programs these days are sophisticated, a thorough career like surveying requires a delicate balance of hands-on experience.



“Working experience is huge. And it’s really hard to get the people that want the right desire to be in the field or deal with that,” said Michael.

He raised the point that many young potential surveyors are also considering careers like engineering, which can have a much faster return on investment than a surveying degree. When it comes down to weighing finances against passion, passion doesn’t always win when higher education degrees clock in at up to \$40k per year.

“I really think the best surveyors are the ones that get the passion. You know here we are, some of us in retirement that we - I thought when I walked out, hey, I’ve done it for 45 years. I’m going to do something else,” Michael said. “I don’t think we can take the surveying out of a real surveyor. You can’t.”

### ***A new House Bill in Florida***

Other states are grappling with this same question and experimenting with ways to find the answer.



Florida just introduced House Bill 821, which will allow the education path to open back up in Florida. The concept is that surveyors will need six years of experience, but the balance between academic and work experience can vary.

If the bill passes, it means students can choose to pursue a four-year degree followed by two years of experience, or a two-year degree followed by four years of work experience, or even elect to do six years of experience only.

Mark, another surveyor in attendance, doesn’t think the Florida bill will pass - and feels that it would be a disservice to the surveying profession if it did pass.

“I understand professionalism, but I also understand that this isn’t a profession that most people don’t even know about. And we haven’t done a good job of advertising it to the masses. And all the schools are dropping their geomatics programs. So we’re at a disadvantage as an industry of getting fresh talent into it. And we’re not doing anything to attract that fresh talent,” said Mark.

He did note that some of the best surveyors he knows were able to get their license without a four-year degree - so this is a tricky dilemma.

“We’ve shot ourselves in the foot, and I don’t see what we’re doing to help solve the situation,” Mark said.

***\*UPDATE: the bill died in the Commerce Committee on April 30, 2021, but I am sure this is just the beginning of these types of bills that will be introduced over the next decade! We need to keep a close eye on every state’s legislative sessions!***

### ***Finding good teachers***

Michael noted that regardless of when and how surveyors-in-training learn, they still need to learn the same quantity of information.

That means that if less training is done in the classroom, it falls on the shoulders of the supervising land surveyor to teach them on the job.

“You’re going to have to mentor and train those people in those higher-level subjects and teach them how to learn and teach them how to research and find their answers on their own,” said Michael.

“But that’s a big commitment. And I don’t know. You know you look at a lot of firms; you got one LS and a whole bunch of field and office staff. He doesn’t have time to look over the shoulders and walk around and spend those types of hours if they’re not getting that four years.”



Even if many professional surveyors had lots of free time on their hands, there’s also no guarantee that they would be good and

effective teachers. True teaching is a skill, and requires preparing content, getting up in front of people, and doesn't always offer the ease of one-to-one mentorship when done in a group setting.

"There never is an easy answer for total learning out of the field. There's never an easy answer for learning totally out of school. So you've gotta balance. You've got to have a balance. You've gotta be able to take the time," Michael said.

### ***Crowdsourced mentoring***

Michael described a former job at the Department of Transportation where he experimented with mentoring at scale.

He decided to devote every Wednesday to preparing anyone interested in pursuing their surveying license.



"When I was at DOT, I had bad morale. When I went in there, people were in the union. They didn't know where they wanted to go. And I said, well, hey, how about we do something for you? How about let's get you all your LS license, said Michael.

So every Wednesday, everyone came in early. Those who wanted to learn land surveying did so under his instruction. It took structure and dedication, but it paid off. Today, four of those individuals now have their licenses.

In a way, Michael sees online workshops like Mentoring Mondays as the perfect mentoring program, bringing novices and professionals together every week.

"I mean, this is crowdsourced mentoring, right? So why does every LS that maybe isn't a good teacher, but gosh, you want to learn how to do elevations with GPS? Who better than retired NGS head Dave Doyle who is going to talk about it in two weeks?" said Michael.

Suppose a program like Mentoring Mondays can be formalized, recorded, and turned into lesson plans. In that case, it could serve as the perfect vehicle to take the full weight of teaching off of busy professional land surveyors' shoulders.

### ***The value of CFedS***

While how to structure surveying education is up for debate, the value of education as a whole is undeniable.

Every professional surveyors can benefit from life-long continuing education. One program heavily discussed among attendees was the CFedS program, which provides the training necessary to execute boundary surveys on or near federal interest lands.

"As a professional land surveyor and also a past BLM chief, I think it's invaluable. And if you have a need for continuing education, why not? Because you'll get more in-depth sight into the federal procedures of original surveys and dependent resurveys, understand the plats, and how to do acreage from a plat without dimensions when you have government lots. A lot of little things like that," Michael said.

While the value of pursuing CFedS depends on where you live and practice, the program has both educational and social benefits.

"It's good credentials. I know this from being on the other side of the fence at an agency too. If I'm looking at a proposal from a company and they show me some of their staff have CFedS designations, I know that those people took the commitment to do all the hours of going through it. And they had to have a passing grade. That shows an interest in higher learning and a commitment to continuing education far beyond what they needed to do to keep their license," said Michael.

Steve Parrish, PLS, the current chairperson and training coordinator for CFedS, has seen 1,300 people sign up for the program since 2006, with about 550 certified CFedS currently practicing.



He is currently organizing five presenters for an upcoming conference, where participants can take a special two-credit hour CFedS course that is offered at half the price of the regular online course.

### *Attracting attendees*

A shortage of new students in surveying programs isn't the only problem facing the surveying world.

At the state level, chapter organization meetings are not seeing participation and attendance from people from the field.

While private-sector employees tend to show up, others don't. The pandemic has only served to exacerbate this pre-existing issue.

"A lot of it has to do with the influx of probably that individual company and what they're willing to step out and do for those guys that say hey look, we want you to advance yourself and just not be a technician or a robot for us," said one attendee.

### *Surveyor shortages and public scrutiny*

John Brady, PLS, a surveyor located in Fairbanks, Alaska, has his own concerns about surveyor shortages.

"This year, I am president of our local Fairbank's chapter of ASPLS. And I'm the youngest guy in the room by 30 years, usually sometimes even 40. And that's a huge issue to me. Because what is the society going to look like in 10 years when I'm pretty much the only one left?" he wondered.

That's one reason why John is so thrilled to have the opportunity to participate in Mentoring Monday sessions and connect with other surveyors across the United States.

"That's the beauty of the technology we have available these days to be able to network outside of our locales and be able to actually get an idea of what people are doing across the country and across the world," he said.

John is also a fan of the Get Kids Into Survey program, which inspires future geospatial experts. During the pandemic, he's been working the program into the homeschooling curriculum for his own children.

"I mean, it's great in one sense because I'll always have a job. But I also want to see the profession grow and continue on and still be around when I'm ready to pass it off to the next generation. Which hopefully will be quite a ways down the line," said John.

Trent Keenan, PLS, raised the important point that fewer surveyors does not necessarily translate into riches and smooth sailing for the surveyors that remain.

"As much as we talk about it's going to be nice because we're always going to have job security; I think the biggest problem that we're going to run into is the public can't wait around for three, four, five, six weeks when we tell them that we can't get to it for a month and a half. So we're going to have an issue on the PR side of things," he said.

In other words, efforts to grow the surveying profession aren't just to ensure there are more bodies in the office. It's to prevent the unknown of new legislation that could follow when the necessary work of surveying simply can't be done on time.

### *A new teaching model*

It's becoming clear that what the surveying profession needs is a new teaching model, where practicing experts and retired professionals can join forces to create engaging and comprehensive educational content without burning out.

Crowdsourced mentoring like Mentoring Mondays and recorded lessons may be able to provide a digital starting point.

For physical in-person classes, Ian Wilson, PLS, is interested in exploring shared teaching opportunities.

"In Evergreen College out here, I keep getting jingles from them saying, can you come to teach a class? Can you come and teach a class? I do not have time to spend, unfortunately, to teach an entire semester of classes. And one thing that I've





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proposed over and over again, and it seems to get crickets or falls on deaf ears, is to get together a few surveyors,” he said.

In Ian’s vision, he would be able to commit to three weeks teaching about survey boundaries, after which another surveyor would pick up where he left off with another topic, and so on until the 16-week semester was over.

Why has his idea fallen on deaf ears? He imagines it must be due to the internal logistics at the college.

“Somebody is going to have to really do some work on this because then you run all the crap about, okay, now we’ve got ten teachers who are going to be here. Ten guys are going to teach this seminar next semester. Do they all need to be set up as employees? How do we - you know, there’s a whole lot of logistics that need to be dealt with, but somebody has got to do it,” Ian said.

Despite the unknowns, one thing is clear: a passion for the profession drives surveyors. And where there’s passion, anything is possible.

With modern technology at our fingertips, there’s hope that we can bridge the centuries-old art of surveying with the modern world, helping to educate and inspire a new generation of surveyors to follow in our footsteps.

If you are interested in learning more about Mentoring Mondays or volunteering as a featured speaker, please contact Trent J. Keenan.



# A Surveying Makeover: 8 Ideas for Attracting and Training New Talent

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*Reprinted with permission of the Nevada Land Surveyors Association, Nevada Traverse, Issue 48.3. [www.NvLandSurveyors.org/nevada\\_traverse.html](http://www.NvLandSurveyors.org/nevada_traverse.html)*

*An abstract of The Geoholics Podcast Episode #86 from June 20, 2021*

Today there is an overriding question facing the land surveying profession: how do you attract new surveyors and train them well?

Numerous articles in this publication have chronicled the dangers of an impending surveyor shortage as experienced professionals retire in the coming years.

The team behind the Geoholics podcast has delved into the question for two episodes and counting.

Their goal? To ask young surveyors exactly what challenges they've faced and what ideas they have to smooth the road into the profession.

They recently tapped three young surveyors to share their stories: Ryan, Davis, and Luigi. Here are some of the ideas that emerged.

## **1. Rebrand the profession**

Dare we begin with the contentious comment that surveying just... isn't sexy?



For anyone outside of the profession, it's often very unclear what being a surveyor actually means.

Davis shared a story that is humorous yet cringe-worthy.

"A crew chief that I worked with previously when he got into surveying he thought he was going to be in the mall handing out surveys. That was his idea of what surveying was," Davis said.

Luigi has been surveying for just three months. However, he agreed that he was clueless about surveying until recently.

"I had never heard of surveying before 2019. I didn't know it existed. I didn't know what surveyors did. I kind of fell into it. It opened up so much possibility, so much opportunity. It's something that I really want to share with everybody I know," he said.

Even veteran surveyor and Geoholics podcast host Kent Groh admits to getting creative when explaining what he does.

"A lot of times, it's you know, 'what do you do?' I'm like, I'm a land surveyor. And it's like, 'you're a landscaper?' I'm like, no, I'm a land surveyor," Kent said.

Kent got so tired of getting a confused response that he started telling everyone that he's a geomatics professional.

"They're like, 'oh my God, tell me more.' And then, all of a sudden, I engage in this amazing conversation," said Kent.

It seems surface-level, but this trend makes one thing clear: the general public has no idea what surveying means. And it's up to us to change that.

Because once people understand surveying, they're often hooked. You're spending time outside. You're making great money. You're working side by side with engineers, architects, and construction teams. And you're contributing to a physical piece of history on every project.

## 2. Increase elementary exposure

One area to start sharing surveying is at the very beginning: with elementary school children.



Expanding programs like Get Kids Into Survey and partnerships with local scout troops makes a lot of sense if you want to get surveying on the population's radar at a young age.

Davis thinks surveying should be mentioned as soon as children start learning how to read maps. However, he's already done some local recruiting and has only been surveying for several years.

"I went and talked to a STEM class," he said. "They were more interested in the GIS cause it was like, 'oh, Pokemon Go kind of uses GIS,' and stuff like that. Of course, that's when Pokemon Go was big."

Not every group of kids will be equally interested in learning about surveying, but that's OK. The ones who do remember surveying will be the ones you want working for you in another 15 years.

"My kid loves coming to see where I work. She loves to come walk around the back. She sees all the robots laid out, and she sees that UPS's, and then you look over and the other side and she'll see all the trucks and then she'll see the four-wheelers," said Ryan, a surveyor with ten years experience.

Ryan has been looking into Get Kids into Survey so that he can volunteer with his daughter's Girl Scout troop.

"They were all doing robots," he said of one Girl Scout meeting. "The robot thing is very important, and it's very cool. But you could tell the kids were just getting burnt out with it. And I'm like, OK, we should do something different. Let's get them outside. Let's get them getting in the dirt. Let's have them look for pins."

Kent was shocked when he got involved with the Boy Scouts in his home state of Arizona and brought back the Survey Merit Badge.

"The survey merit patch hadn't been offered in like 30 years here in Arizona. Then the United Surveyors of Arizona that I preside over started doing it about four years ago. Every time we offered it, it was completely booked out. It filled up fast, completely sold out. But, every time we administered it, and the kids were out there, they were engaged. They loved it," he said.



If you're a surveyor with young children, consider volunteering to visit your child's school or scout troop to do a short presentation.

## 3. Create a PR campaign for parents

One lightbulb idea is that perhaps marketing surveying to kids isn't the most effective step. Perhaps we really need to market the profession to parents, who have such a significant influence on their children's lives.



That's what happened to Ryan when he found himself stumped at junior college, unsure what to do next.

"My mom bumped into a friend who was actually a CEO of a local engineering firm at the time. And they're like, oh, we need an instrument person, has he done this before? No? We'll throw him in it. And the next thing I know, for three years, I was the guy standing behind the drone with a radio," he said.

Ryan was also influenced by his stepdad, who had been a crane operator and knew the value of a good surveyor firsthand.

Davis agreed.

"It starts with parents," he said. "If the only thing they know about surveying is a mom and pop place—and not knocking mom and



pop places. I mean, that's kind of how the surveying industry was built—but if that's the only thing they know, they don't know there's this giant company that all they do is aerial surveying LIDAR. They don't know what that is. They don't know how cool that could be for their child to take part in."

It's easy to forget that parents are often the ones guiding young children, whether that guiding is done consciously or not.

But parental influence can't do anything to help the surveying profession if parents aren't aware of the breadth and benefits that surveying offers.

#### **4. Supercharge social media efforts**

There's no beating around the bush. Today, if you're not on social media, you might as well not exist.



That's a resounding reason to jumpstart social media surveying campaigns and resources targeted towards every age group: teens, students, and parents alike.

Luigi is 25 years old and knows that the amount of social media young people consume is enormous.

"I help out in the youth pastor role here in my local church. So I can see firsthand the number of kids that have TikTok, Instagram profiles, it blows my mind," he said. "There's a lot of visibility, and frankly, that's kind of how I got engaged in the profession."

Luigi was connected on Instagram with a friend and had been following his posts. He was a surveyor at the company that Luigi now works at today.

"I looked at his posts. I found it interesting. I sent him a direct message, and he was gracious enough to respond and engage in that conversation. The importance of having that visibility on social, it's a great asset that we can use to give good propaganda of our profession," Luigi said.

Davis finds that social media has also been a great connection point to surveyors on a national and global level, giving him a greater sense of professional community.

"On Facebook, I like some of the surveyor groups. I just see how the impact grows that community. For example, I've connected with guys that are surveying in California. Even though I'm over here in Georgia, I like seeing what it's looking like for them to survey in California. It doesn't matter where they're at in the states or really where they're at in the world. They're running into the same problems that we are," he said.

#### **5. Create cross-curriculum opportunities**

Dedicated surveying programs can be hard to come by. So why not try to cross-pollinate with other disciplines, introducing surveying as students study related professions?

Davis started in forestry, and Luigi started in engineering. Both found surveying along the way and made the switch. It stands to reason that more students would follow suit if they had the exposure.

"I went to school for mechanical engineering. I did about three years of school, and I started to get disenchanted with what I was learning. I just couldn't see myself sitting in an office in front of a computer for 30, 40 years," Luigi said.

Luigi was in a lackluster civil engineering job after graduation until he contacted the friend he followed on Instagram.

"I think it needs to be offered more in the civil engineering program,"

Ryan agreed.

"It'd be nice if there were a couple of classes. Some of the engineers that we have that are really good have spent their summers with us, seeing what we do. It gives them a different perspective on how they do their work instead of just going by the theories and the math," he said.

When schools can offer a teaser curriculum for different professions in related programs, it benefits everyone involved.



## 6. *Make mentoring a priority*

It's one thing to attract surveyors to the profession; it's another to retain them.



Mentoring isn't related to attracting new surveyors to the profession. But it is important to keep new surveyors empowered and engaged so that they don't leave the profession in discouragement.

Davis recalls being thrown into the deep end when he started surveying three years ago, and it was a difficult experience.

"We were just so busy that they didn't have time to really put someone on me to train me up. They just kind of put me with a crew chief. It's like, all right. He knows what he's doing," Davis said.

Davis ended up moving to a new company, where the mentorship experience has been like night and day.

"There's two licensed surveyors and other guys that have been surveying longer than I've been alive. They've been awesome with just taking their time. If I'm working out a boundary resolution and something's just not jobbing off the old deed or plat or whatever, they're so nice about coming to my office and showing me," he said.

Luigi had a similar experience when he started his first job with an equally floundering party chief at a small company.

"He was actually two years younger than me," Luigi said of the party chief. "He kinda got a little short-changed as well because he wasn't able to have a solid, consistent mentor with him either. So in certain situations, it was kind of like the blind leading the blind."

You can be as intelligent and hardworking as possible and still feel like a failure if you don't start your career with proper guidance.

"We toughed it out together. But I came away from that experience with a really deep appreciation for a mentor that's close by, that's consistent with you and willing to answer questions," Luigi said.

In some professions, it's possible to be self-taught. But in a technical profession like surveying, it's much more difficult.

One idea would be to create a remote mentor-pairing service or survey mentor hotline, where young surveyors without a mentor figure could reach out to experienced surveyors with questions.

This could be an excellent opportunity for retired surveyors who are ready for a well-earned break but still want to have a hand in helping young professionals.

## 7. *Firms: don't pigeonhole your surveyors*

Another job-retention factor for young surveyors is being able to stretch their wings and experiment with diverse projects.



At a busy surveying company, it's easy to get caught up in the day-to-day rush.

But don't forget that new surveyors are looking for exposure, not just to do one single role or project type for the rest of their career.

"I've noticed that with a lot of guys who go and get their degrees, it's like oh, we're gonna hire this young surveyor right out of college who knows a little bit, train him up, throw him in his own crew. And then he's going to be there for the next five years while he forgets everything he learned in school because the only time he comes in the office is to get a new job," Davis said.

"That's something I personally experienced. So I started looking for a new experience and ultimately landed the jackpot where I'm at right now, having the mentors that I've had."

Ryan had the opposite experience—and as a result, he couldn't be happier.

"I started off my day doing construction staking. I was staking a storm sewer. I think I put fault structures in the ground. That was the morning. The afternoon was doing a parking lot survey," Ryan said.

"I never know what I'm walking into. For the rest of the week, I know I'm doing a big humongous service for an expansion on a building. And I think next week we're doing a solar field. So I am very fortunate that I get to do a lot of different things."

Young surveyors seek companies where they can experience a variety of tasks to add to their repertoire and resume and enjoy the many diverse experiences that being a surveyor offers.

### ***8. Collaborate at a national level***

To solve the hurdles facing surveying, it's going to take a group effort.



That means developing and enhancing national surveying resources as well as local ones.

“We’ve talked to surveyors and geomatics professionals from all over the world. And every single person, every surveyor, and geomatics person we’ve talked to, they all experiencing the same things that we are,” Kent said.

The rewards, the challenges, the shortage of surveyors—none of these issues are confined to one individual state.

For that matter, these issues impact surveyors around the globe.

Surveyors can be passionate, but they can also be prideful.

“Surveyors are very prideful. They can think that their solution is the only solution,” Kent said.

“Surveyors as a whole, we need to come together is what it boils down to. You know, if a fellow surveyor has a question or raises a question about a corner that you set, we’ve gotta be open-minded. We’re not fricking perfect.”

As you continue to practice, remember that other surveyors, especially young ones, need your support. The more you can build mentorship, growth opportunities, volunteering, and promotion of surveying into your practice, the better off the profession will be.

To learn more about The Geoholics Podcast, visit their website at: <https://thegeoholics.com>





# Advanced Education to Become a Licensed Land Surveyor: Is It a Help or a Hindrance?

*Prepared by Trent J. Keenan, PLS*

We had multiple panel discussions focused on moving the profession forward at the 2022 Western Regional Survey Conference. This conversation centered on whether the advanced education requirement is a help or a hindrance to the profession, and this is an abstract article based on these discussions.

Many of today's surveying companies have less than five employees. They're also booked out for months. Demand has never been higher for surveying professionals—in part because our workforce pool has never been smaller.

The million-dollar question often asked is whether specific education requirements will help bolster our workforce or leave it lagging even further.

In this article, we will focus primarily on the path to becoming a licensed land surveyor. We all understand that not everyone wants to peruse licensure and we still need just as many survey technicians over the next few years.

## ***Professional land surveyors are on the decline***

It's tempting for surveyors to look at the current climate as job security and a hefty paycheck. But in the long term, we need more surveyors to fill our ranks.



Why? It's only a matter of time before the short supply of surveyors results in legislative change. Developers aren't patient. If they have to wait three months to get a boundary or topo survey, they'll head to the lobbyists.

The most likely candidates to fill surveyor shoes are engineers. There are currently 513,000 engineers who already have a formal education and would just need a few extra surveying classes to round out their eligibility to tackle surveying work.

There are currently 35,000 licensed land surveyors. An estimated 44% of surveyors over the age of 61 are going to be retiring in the next 10 years. That's a loss of 15,000, which means our profession needs to average 1,500 new licensed surveyors a year just to maintain the status quo. Meanwhile, only 596 people are taking The Principles and Practice of Surveying (PS) exam right now, and only 68% of those will likely pass.

The need for more licensed surveyors is clear. Is education the answer?

## ***Will degree requirements solve the land surveyor shortage?***

We may not answer that question here, but we will explore it in full.



The truth is that the current generation of professional land surveyors came to surveying through a wide variety of pathways. Many fell into surveying later in life.

Here is a small sampling of how attendees of the 2022 Western Regional Survey Conference came to the land surveying profession:

- An associate degree in AutoCAD, no formal surveying education.
- An associate degree in land surveying
- A survey technician role, plus some high school drafting classes
- A bachelor's degree in aviation management and a few classes in surveying—after a 30-year career at Caltrans
- A surveying career after 20 years in the Air Force
- A degree at Great Basin College
- An engineering dropout who became a survey technician, then went back for a bachelor's degree in land surveying and geomatics 10 years later

There was not one clear path into surveying for the current generation of land surveyors, and there still isn't a single path today. There are pros to this fact, but also cons.

In recent years, more emphasis has been put on advanced education, but our numbers are declining more than ever. Are new degree requirements to blame? Perhaps in part, but that doesn't explain why numbers in states like California and Arizona are also declining—neither of which has any degree requirement for licensure.

The truth is that the puzzle is more complicated than that.

### ***Requirements are inconsistent between states***

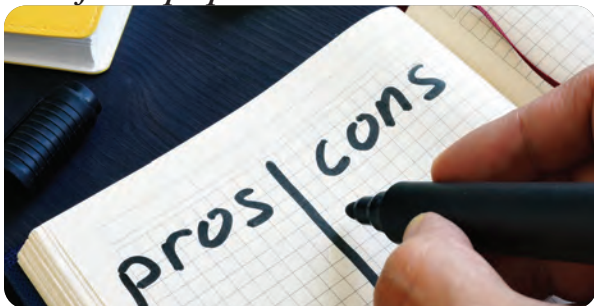
Education requirements from state-to-state have always varied. Currently, there are about 38+ states that require either a certificate, a two-year degree, or a four-year degree in order to become a licensed land surveyor.

On one end of the spectrum are states like Arizona, which requires only six years of experience, and no education. This makes it one of the least stringent and easiest of all 50 states.

On the other end of the spectrum are states like Nevada, which requires a four-year bachelor's degree plus four years of experience in order to become licensed, although the degree does not have to be strictly a bachelor's degree in surveying, but you will be required to have some college credits in surveying. In the middle are states like Utah, which requires a two-year associate's degree plus four years of experience.

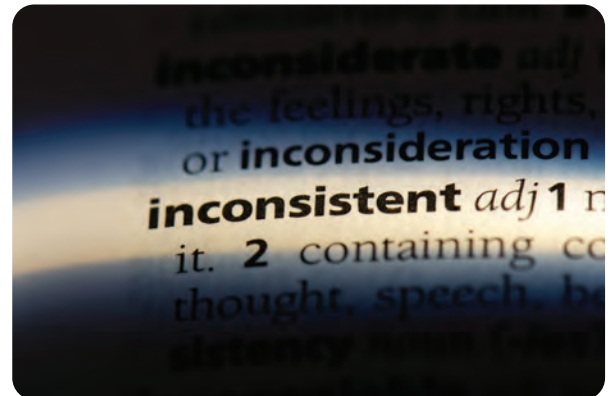
Requirements aren't static. For instance, Texas just switched from a four-year education requirement to two years. The problem? Their test pass rate went down significantly. The purpose of lowering the education requirement was to get more people licensed. But if you're not getting people licensed, it's not helping the profession. North Carolina just did the same thing by lowering their requirements from a four-year degree to a two-year degree as well. You can read more about the changes by searching North Carolina Senate Bill 219.

### ***Pros of multiple paths to licensure:***



The multiple paths to licensure discussed above do have benefits. Not all students are interested in 4-year degree requirements, and would prefer to attend community college. By talking to the Association of School Counselors, we can advertise the fact that there are multiple paths into our profession, including those students who want to get working right after high school.

In Arizona, the overall number of licensed surveyors is going down, but that drop does not seem to be tied to education. 75% of land surveyors in the last year and a half have had either no formal education or an associate's degree, but they are still passing all the exams required to get licensed.



When we define licensure, it is a minimum standard to be able to practice as a land surveyor. It is not a statement that you're actually good at what you're doing; it means that you are minimally competent to do it.

Many surveyors believe that a path to licensure through experience is just as valid as a path through education. For example, the CST program is not tied to a formal education requirement, but is still an opportunity for surveyors to prove their knowledge through exams.

The largest benefit to multiple paths to licensure is this: the more options you offer, the bigger the "funnel" will be of incoming surveyors. If the problem with our professions is getting bodies in the door, strict education requirements will only limit that. Such requirements may result in better surveyors, but fewer of them.

Having multiple paths opens up that base level of surveying to a lot more people. The key is to get people in the door, period, and then funnel them up as they become ready. If we restrict the base level by adding requirements, we restrict the profession as a whole.

### ***Cons of multiple paths to licensure:***

There are also cons to offering multiple paths to surveying. The biggest issue is that our profession is not providing a clear message to those coming into the profession, because we're giving them those alternate paths. Sometimes if a path is too unclear or complicated, people will avoid it altogether.

Many of today's licensed surveyors came from different paths. But that was then, and this is now. In today's world, multiple paths can be a hindrance.

Our requirements are inconsistent between states. Our surveying schools are few and far between. When presenting the profession to a 15-year-old high school student, that type of inconsistency can be challenging for a young person trying to make an informed career choice.

In order to provide a more consistent message and a unified front to our profession, it would behoove us to pick one clear path to licensure and advertise it. Otherwise, we will continue to get surveyors who come into the profession and then sit on the sidelines as they wait for the degree requirements to get reversed.

If we pursue additional changes like expanding the experience-only route, it could just be a short-term solution that gets us further away from that single message that will help us see long-term success. It may also send the wrong message as to profession vs. occupation.

### ***Surveying needs a unified voice***

Whether we pursue one path or continue to offer multiple paths, what's clear is that surveying needs a unified voice. NCEES developed the model law, how many states have adopted it? The statistics can show us what's happening, but only by coming together as a profession can we decide what we want to do and work towards greater clarity.

We need to collectively decide if education is valuable or not, and in what forms. Then, we need to take steps to make it happen.

Up until this point, individual states have undertaken grassroots efforts to help the profession by implementing or modifying licensure.

Fresno State, Great Basin, and New Mexico are all trying to work on academic programs in order to get the profession more well known and create a different, modern narrative as to what it is. The issue is that everybody's doing it all on their own. We have to have the support of our associations and Board of Registration to say: this is what we want. We want it to be better. Let's support it. Let's do it.

With declining numbers, we have to do whatever we can to bring everybody in. We may never get all 50 states to have the same licensing requirements, and we will have to accept that. But we need to be more consistent with the messaging that we're sharing with new surveyors.

### ***Is an advanced degree necessary?***

#### ***Pros of advanced education requirements:***

The benefits of higher education aren't just an increase in surveying knowledge. The real benefit lies in learning how to think critically and solve problems. Education provides discipline, researching skills, and the ability to ask the right questions. When surveyors have gone to school, they are often more proactive when problems arise, quickly picking up the phone to seek out solutions.

Keep in mind that degrees don't need to be in surveying to be valuable. They could be a degree in construction management, GIS, business, or some other application.





Degrees come in especially handy in more complex environments, such as urban areas. In dense city blocks, surveyors aren't going out looking for corners, they are doing construction surveying. More complex environments and new complex technology are both good reasons to formally educate and train our workforce.

Topics like properties of light and wavelengths can prepare surveyors to do remote sensing. Technology is pushing our profession to be better, but we're not always smart about it. Many of today's surveyors need to be more than technicians. Technicians are critical, but we need an element of the workforce that goes beyond button-pushing.

In short, education helps you learn how to learn.

### ***Cons of advanced education requirements:***

It's hard to argue with the fact that education is important. But is it helping the profession out of its current predicament? Many would say no.

The original intent of the education requirement was for us to get equal footing with other professions, period. To validate land surveyors as professionals not as an occupation. At the time, expanding the workforce wasn't a key part of that conversation. Many surveyors now question how long we are going to continue to pursue degree requirements as we watch our profession die out.

To keep our profession alive, there is a clear argument to embrace non-education paths to surveying.

It's possible to require training and tests to become a professional land surveyor without requiring a degree. Those surveyors who want a degree could certainly obtain one, but there should also be other clear paths to the profession.

It can be hard to sell exactly how a degree helps you as a professional, especially when surveying best practices sometimes outpace classroom curriculum. Trade school and certifications could also do the trick of setting a bar for licensure and provide more direct and relevant education in the process.

Students leaving a 4-year degree don't know everything. And even those obtaining a degree in surveying only have very few credit hours directly related to surveying. They may not even know how to find a corner until they get on-the-job experience.

There is also the fact to consider that most young surveyors have no interest in going back to school to get licensed. But they might be persuaded to pursue other avenues to professionalism if those options were offered with unified clarity.

### ***The challenges facing higher education programs***



Requiring a four-year degree is one thing, but requiring a four-year degree in surveying is another. It's becoming more complicated each year as more and more universities fail to see the value in their surveying program, and drop it.

Over the last couple of years, our education committee interaction has been lacking. For example, money collected over the last decade with the intention of endowing a chair at Fresno State has never materialized.

Funding is probably the biggest problem facing surveying programs, and the next problem is the perceived relevancy of the curriculum.

Of the universities that do have surveying programs, is there a way to know for sure if they are meeting the needs of the profession? The primary reason that a degree is useful is because of rapid changes to technology. But if schools don't have access to that technology, or are using technology that is 10 years old, is anyone benefiting?

Some programs have obtained classroom technology by partnering with local survey firms to borrow the latest equipment for labs. Others have partnered with vendors like Leica USA or even Trimble to have the latest equipment donated, then giving it back so the vendor can sell it to survey firms at a reduced rate. But those formalized partnerships seem to be the exception to the rule, rather than the norm.

### ***The value of the CST exam***

One program that we can utilize more heavily is the CST program. Currently, the program is most active on the east coast, but it is beginning to see wider adoption and recognition out west.

The CST level three is technically equivalent to an LSI, while the CST level four is almost equivalent to the knowledge of a licensed surveyor.

In states like Florida, in order to work on any Florida DOT work, your party chief must be a CST. In Nevada, some of the local municipalities are going



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to add additional points if you have CST on your staff.

One current downside is that it is expensive to obtain your CST and upkeep it. Approximately 500 CST exams are administered yearly, and only 2,200 are active. The CST level one is often free, but if individuals don't see a clear benefit, they don't renew. If employers were to provide a monetary incentive to take the CST and keep it up, we would see higher involvement.

If the CST were adopted more universally across the United States, we could see an enhancement in survey knowledge and professionalism. The test bank would also need to be treated as a living document that gets continually revised to reflect current industry trends and technologies.

### ***The argument for creating a new professional track***

An interesting argument that builds from the above perspectives is that there could be great value in creating a new professional track within the land surveying profession.

Some surveyors have argued that there should be a new certification path to become a professional-category land surveyor, below the level of a licensed surveyor.

This idea acknowledges and embraces the fact that there are two main paths to land surveying: those who want to become fully licensed land surveyors, and those who do not.

Many of our talented technicians have no desire to go to school whatsoever, and no desire to become licensed surveyors. And we need to focus on investing in and training those individuals. Meanwhile, we can still consider requiring a bachelor's degree for those who do want to become fully licensed.

A non-accredited professional online program could help draw in technicians. Such a program could be combined with a summer camp or placement program where techs could meet surveyors to work for. Whether or not such a program is accredited doesn't matter as long as it's sponsored by a groups like WestFed or NSPS.

The key ingredient here is the support of WestFed or NSPS to set up such a pathway or apprentice program. Once supported, the program could be rolled out to state boards. We can take charge of our profession and create something new that meets our profession's unique needs.

It seems clear that to help our profession, we must get people interested and involved. Sometimes, interest takes time to build. Your employees may not want to become licensed and take over your business today. But in another decade, their outlook could change.

If we can increase the overall pool of talent coming into the profession today, then we can increase the chances that a percentage of those employees will get licensed in the future. In the meantime, we can build up professional-track curriculum that is timely, relevant, and caters to working surveyors.

A certification that is in-between entry-level and licensed could help to provide a clearer path to advancement and earning potential, while also attracting and keeping employees in the profession. The average 18-year-old may not be passionate enough about surveying to pursue a license right out of high school, but a seasoned technician could be.

Our task will be to take the ideas outlined here, vote on the best path of action, and urge WestFed or NSPS and NCEES our national organization to help us provide one clear and unified front to push the profession in a new and productive direction.



# Threats to Licensure: How Can They Be Avoided?

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

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*At the 2022 Western Regional Survey Conference, multiple panels focused on brainstorming some of the current threats to the profession, and this is an abstract article based on these discussions.*

It's a fabulous time to make money as a land surveyor, but the honeymoon period won't last forever. Therefore, we must identify the various threats to licensure.



## ***Threat #1: Too Few Licensed Land Surveyors***



The number one threat to the licensed surveyor community is our aging workforce. Licensed surveyors are aging out, and we are not recruiting enough replacements.

According to NAICS Code 541370, the number of individuals in the land surveying profession in the United States tops out at approximately 53,000. However, of those 53,000, only 35,000 are licensed surveyors.

Many of those professionals due for retirement in the coming decade leave our nation with a notable absence of licensed surveyors. This is worrisome as our current workforce is already stretched thin, with many clients desperate to get surveyors on the phone—some of them calling 20 different surveying offices with no response.

According to the 2019 US Census Bureau data, there are about 7,200 surveying firms in the United States. 4,400 of those firms have less than five employees, and 6,000 of them have less than 9 employees.

Mom and pop surveying operations do not need a lot of personnel. As a result, they often do not hire additional bodies until an existing staff member retires. The problem is that once those staff members do retire, there will no longer be any newly licensed surveyors ready to fill their shoes.

Surveying is a vital industry that requires bodies to get the work done. When developers can't get their work done, they ultimately will go to the legislature to lobby for change. We don't want to find our profession at the mercy of elected officials who have no idea what we do and the details of our role.

It remains in our best interest to unite our efforts into “ONE” powerful voice that will help us stay ahead of potential legislation that will come.

Too few of licensed surveyors is a recipe for trouble and was clearly the number one threat discussed during the Western Regional Survey Conference.

## ***Threat #2: Lack of Awareness***

After identifying the number one threat as a dwindling workforce, the panel inevitably transitioned to the question, Why are no new young surveyors lined up to take the place of soon-to-be retirees?

A large part of the problem is a lack of awareness of the profession. Our profession's outreach efforts are lackluster, and we simply aren't reaching the right people, at the right time, in the right ways. Again, a consistent, powerful, united voice is needed in order to increase awareness, including:



- Recruiting at a younger age
- Involving the right people, such as school counselors
- Making outreach fun and relevant
- Targeting beyond friends and family

### ***Threat #3: Rapid Changes in Technology***



There is no question that drastic updates to technology are also impacting our ability to educate and equip our workforce properly.

The majority of small survey firms cannot afford to shell out for a hundred thousand dollars worth of gear, so affording the latest and greatest tech resources is one hurdle.

Another hurdle is making sure that educational resources keep up with technology. When tech changes at a fast pace, we rely on resources such as the following to train our workforce:

- Educational institutions
- Professional exams
- Fellow surveyors and mentors
- Associations continuing education

School curricula must be updated regularly to reflect changes in technology, and classrooms need to have access to new, expensive technology if students are to get proper hands-on experience. Both of those factors can be difficult to ensure.

Professional exams like the CST have the potential to be incredibly timely and helpful, but the exams are expensive to take, and the certification is pricey to keep active. A useful exam also relies on up-to-date test banks that reflect the work that is going on in the modern survey industry.

Finally, mentoring on the job is difficult in an era of one-man survey crews. To truly help our workforce progress and prepare for licensure, we need to be able to train them on both the latest tech and pass down wisdom from older surveyors to younger surveyors.

Some firms are raising their prices solely for the purpose of creating 3-man-crews so that they can adequately train new green talent.

Other resources like Mentoring Mondays, Roundtable Tuesdays, and Wisdom Wednesdays seek to fill the training and mentoring void in our profession by bringing professionals together virtually to learn about timely topics.

In the era of emerging tech, it's also a great time to double down on collaboration and cross-pollination between industries and professionals, such as IRWA and GIS professionals.

### ***Threat #4: Inconsistent Education Requirements***



Another perceived threat to our profession is education requirements—or lack thereof.

Currently, states vary between requiring a four-year degree, 2-year degree, experience, or some combination of education and experience to become a licensed surveyor.

There's no question that education is important to do our jobs well, but it is a question of whether that education should take the shape of a formal degree or more abbreviated professional training and certifications.

Right now, it's unclear whether formal degree requirements help or hurt our profession. Both states that do and do not require degrees have seen drops in the number of surveyors getting licensed each year.

It is a notable fact that the average age that a surveyor becomes licensed is approximately 38 years old. In other words, it's often a “later in life” career. The big question is, how many of these potential licensees that likely do not want to go back to school at 38 years old are we losing by requiring a degree? One surveyor cited that he has roughly half a dozen people at his firm with 25+ years of experience. At this point in their life, they're not planning to go back and obtain a bachelor's degree. But they may certainly be interested in an alternate path to licensure that centers on increased experience rather than a degree.



The final issue with degree requirements stems from the fact that the higher education survey programs is that the ecosystem is at risk. We have a lack of Ph.D. candidates to serve as professors. Nevada's Great Basin program has been seeking a second professor in order to become accredited for over 10 years, without success. And in some cases, existing accredited survey programs are getting cut due to low enrollment.

Again, there is no argument here against the value of education. All surveyors benefit greatly from technical courses, boundary classes, and business and communication classes. The question is simply how is the requirement of a degree for licensure impacting our numbers and the profession. Is it a threat and if so, what is the education-plus-experience recipe for success when it comes to becoming a licensed land surveyor?

We need clearer national standards in order to cultivate a unified voice and enhance public perception of our profession.

### ***Threat #5: Perceptions of Pay and Advancement***

Finally, there is one benchmark that can deter or attract talent to any profession: the perceived ability to make good money and advance your career.

In the current climate of high-demand surveying, there is no reason that firms should not be charging premium rates and paying their employees accordingly. We need to combat the perception that engineering is a superior career pathway simply because engineers make more money. Young professionals also want to see a clear path to progression once they enter an industry. They may not expect overnight success, but they do want to know the steps that will take them from step A to B.

While small firms with slow staff turnover may not be able to guarantee quick progression, firms of all sizes can still do things like let new surveyors master equipment sooner, encourage them to attend conferences and professional events, and pay them appropriately.

It boils down to providing the type of working environment and support that allows individuals to feel like true members of the profession rather than just button-pushers. If we can do that for both current and potential employees, we will have a good shot at protecting and enhancing our beloved profession.



# Surveying and the Great Education Debate

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*Reprinted with permission of the Nevada Land Surveyors Association, Nevada Traverse, Issue 48.4. [www.NvLandSurveyors.org/nevada\\_traverse.html](http://www.NvLandSurveyors.org/nevada_traverse.html)*

*An abstract of The Geoholics Podcast – Episode Geoholic Anonymous from August 23, 2020*

Perhaps nothing is discussed more frequently—and heatedly—in surveying than educational requirements.

Should formal education be required for surveying? If so, how much?

If required, how standardized should an educational requirement be among states?

And is education *really* necessary, or would an apprenticeship model do the job equally well?

The truth is the question is even more complicated than it sounds. But there are some unique models out there that provide a starting point for the creative educational solutions that have the power to move surveying forward.

We spoke to several surveying professionals who have also been teaching in the classroom for decades to get their firsthand take.

## ***Modern surveyors benefit from education***



One thing is becoming increasingly clear: the surveying profession is becoming more complex each year.

Surveying has a rich set of histories and traditions, but that doesn't mean that surveying practices are stuck in the past.

The rise of new technologies means that while senior surveyors could happily complete a career without needing any formal education or technology training, new surveyors may not have that luxury.

Joe Paiva, PLS, is the CEO of GeoLearn, an online continuing education company designed for licensed land surveyors and technician training. He's also an adjunct instructor at the State Technical College of Missouri.

Missouri happens to be a state that has minimal education requirements for land surveyors. No college degree is required, just 12 credit hours of surveying coursework. It's something Joe's been working to change for years.

Joe believes that just because things were done one way in the past doesn't mean that the surveyors of tomorrow should be short-changed.

"I want my children to be better than me. I want my students to be better than me. And I want their students to be better than them. And if we don't have that way of thinking in the profession, and we don't have enough of us educators and other people with four-year degrees who have a broader view of how that works, how do you pass the baton?" Joe said.

"We sometimes as a profession tend to think of our profession as being static. That there's nothing changing in how we do our work, whether that's the legal aspects or any other thing."

His opinion is that we can't be a profession that is always looking in the rearview mirror. Instead, we need to transition into a profession that is looking forward to the future, and education is a part of that.

Jim Coan is a professional land surveyor in Washington and Oregon and a certified federal surveyor. He worked for 1 Alliance Geomatics in Seattle and taught at Renton Technical College for 23 years.



He agrees that we need to look forward. “I used to tell my students that when I started surveying in 1968, it was closer to the way George Washington surveyed than the way we’re surveying today,” he said.

“We’re not plain surveyors anymore. We’re geomatic surveyors, like it or not. And we need to know that stuff, and we need those technicians to know it.”

Jim currently teaches a class on random error theory, which he believes is one of the most valuable classes a surveying technician can learn because it teaches important measuring skills.

“I used to be one of those guys: nope. We don’t need any education requirements,” Jim said. “But my mind has been changed. We need to have the technical expertise. And that comes through a combination of experience and education.”

### ***Education differentiates you from the crowd***

Even if you live and work in a state with little to no formal education requirements, education is the way to go if you’re serious about advancing in the profession and standing out from the crowd.

Education doesn’t have to consist of a four-year surveying specific degree.



While a four-year degree in any subject is a valuable asset because of the critical thinking skills it provides, the reality is that most surveyors are non-traditional students by the time they make it into a classroom.

Maybe they discovered surveying late in life and already have a family to feed.

Or maybe they’ve been happily working as a technician for many years before getting the urge to take the next step in the surveying profession.

Adam McCartney is a survey party chief at the Maricopa County Department of Transportation in Arizona. With 19 years of experience in the field, he enrolled at Great Basin College just three semesters ago.

“I’ve made a pretty good living being a solid technician and party chief in the field. And there’s no reason that I can’t continue to do that for another 20 years and sail off into the sunset. But I have a drive inside that’s pushing me to go beyond being just a party chief,” Adam said.

Adam already has a CST Level 3 and is now on the path to getting licensed. However, he knows that the more serious he gets about becoming a professional, the more opportunities he’ll have to advance.

“Arizona has no educational requirement for licensure, so anybody can go get a license in Arizona. And I’ve seen some surveys that are evidence of that. And so, what I wanted to do was try and do something that in the future is going to separate myself from my peers because it’s getting more and more competitive out there,” he said.

He hopes that obtaining a Bachelor of Applied Science in land surveying will help give him an edge.

It took him nearly two decades to decide to get a four-year degree, not just because his motivation took a while to kick in, but because it was daunting to wrap up a full day of work as a young surveyor and then go straight to class afterward.

“I reached a point when I discovered Great Basin College. And with the advent of online technology, there were really no more excuses for me not to do this. I can do it right here from my desk at home late into the night, early in the morning,” Adam said.

### ***Surveying is a delayed vocation***

In his many years as an educator, Joe can attest that many surveyors end up in the classroom later in life.

“A lot of those people [I teach] have never been to college in their life. Some of them are 50 years old,” Joe said. “For many people, becoming a licensed professional is a delayed vocation.”

The complication arises from the fact that there are few dedicated surveying programs in the country and fewer still options that offer older students the flexibility to thrive.

Todd Horton is an instructor at Parkland College in Illinois, where he created a land surveying program in 2001 and is the director of the construction management program. A teacher for over 23 years, he is also the owner of Meridian Geospatial Consulting.

He recognized that traditional classroom education models weren't meeting the needs of most surveyors.

Instead of sticking with the status quo, Parkland College decided to change things.

"We've evaluated our market and realized the low hanging fruit—the people that want the most to come to get training and get licensed—are the ones who can't because they're already working. So, we have changed our model so that instead of having to come to classes during the week, they come to get our hands-on labs on weekends."

In other words, instead of coming to class once a week for 16 weeks, surveying students can come for three weekends per course.



"Our mantra is come earn 24 credit hours of surveying but coming to Parkland one weekend a month for 24 months," Todd said. "Our students really love it because it fits their life."

This is the crux of the debate about surveying education: we do need education, whether it's a degree or continuing education, or both.

But what we also need are innovative methods for getting that education, such as online programs, boot camps, or weekend labs.

### ***Educational programs for surveyors must be nimble***

Saying that we need flexible education opportunities and creating those opportunities are two very different things.

Particularly at four-year institutions, changing things up is a long, drawn-out process fraught with political complications.

It's often much more possible—though still not easy—to make meaningful changes at more agile community colleges.



Joe, Jim, and Todd each have compelling examples to share of ways the institutions they've taught at have implemented changes for the better.

"In Missouri, we've decided to provide as much of the education online as possible so that they can get it no matter where they are in the state, or for that matter in the country," Joe said.

Like the weekend lab option that Todd described at Parkland College, Joe's seen even more flexible options in play.

"When I taught for a year at Texas A&M Corpus Christi, they allowed labs to be done remotely mentored. So, we have lab projects, and we tell the students, if you are too far away from campus, you find the licensed surveyor who will actually sign on the dotted line and provide the equipment," Joe said.

That means students could partner up with a boss, mentor, or another licensed surveyor to complete the lab work using that surveyor's equipment instead of traveling to campus in person to use equipment at the school.

Completed lab work is then sent in to be graded in the normal manner, once signed off on by the local surveyor.

"We're still doing the grading the same way. We still provide the same outline for how the project is done. But different people do it differently. And I think that's a good recipe—not the only recipe—for in the future being more inclusive of the entire population to have access to good surveying education," Joe said.

At Renton Tech, Jim said the two-year surveying program was founded based on a vocal need from the profession.

"The education committee chairman for the LSAW, Land Surveyor Association of Washington, came to the school and said they wanted to put together a two-year program," Jim recalled. "The president of the school said, yeah, we'll look into that. But we have to get a buy-in from the profession first."

Jim presented the case for a two-year program at a Renton Tech board of directors meeting and explained why such a program would be valuable. The board then endorsed the plan, and the surveying program was born.

To further design the program for actual surveyors, Renton invited professional surveyors to campus.

“The Dean said if you could have your surveyors learn anything you want them to learn, what would it be? And they started writing it down, and we refined it from there. And that’s how we created it,” Jim said.

To say the program was a successful model would be an understatement. According to Jim’s tracking, the program has hosted 78 professional land surveyors and over 100 LSITs. To top it off, Jim is currently employed by one of the graduates of that very program.

Todd is also excited about new programs being formed in Illinois.

Through the US Department of Labor, the Illinois Professional Land Surveyor’s Association has created a new apprenticeship program.

“We call it a boot camp, basically learning how to set up and operate basic instruments. After that, those apprentices will be starting some formal training. It’ll be effectively four college-level courses at Parkland College spread out over the next two years,” Todd said.

The belief is simple: if they grow an apprenticeship program, some of those apprentices will eventually self-identify as future land surveying professionals and voluntarily seek out the next step in their career.

Again, this type of program is made possible thanks to an agile and flexible mindset.

“One of the reasons that Parkland is able to keep doing its thing is that we’re fairly nimble from a business model standpoint,” Todd said. “We have the ability to hire people based on their experience, whereas some of the universities don’t. Because of their charter, they have to bring people in with the masters and the Ph.D. level. And there’s not very many of those.”

The overhead and the infrastructure at the university level can be a blessing, but it can also be a cost that has to be dealt with.

When Todd says Parkland is nimble, he means that they transitioned from a traditional survey program to their new weekend land surveying program format in just six months.

The program was first advertised at the 2017 annual conference of land surveyors. The demand was instantaneous.

“That very day we announced it, I had people coming to our table saying, where do I sign up?” Todd said.

### ***Technicians are undervalued***

All this talk about education should not detract from a single important fact: perhaps the greatest asset to the land surveying profession are its technicians.

“We also have to tell our surveyors that if you choose to stay a technician, you can make a very good living. Every person does not have to become a professional technician. As we all know, they’re worth their weight in gold,” Jim said.

If you’re a licensed land surveyor, try to picture your day-to-day workflow without technicians. You probably can’t.

Not everybody has the aspiration to become a licensed professional land surveyor, and that’s okay.

Surveyors, instrument operators, and party chiefs are all engaged in the work that makes companies money. They are literally invaluable.

Todd agreed that technicians are the foundation of the profession.

“Generally, when I talk to people, they’re saying we need three to five technicians for every land surveyor. And I know in my state, there’s been such a push over the last two decades to make sure that we’re getting professional land surveyors pumped out that we have neglected our technicians. Our technicians are the most underserved and most important people in our profession,” said Todd.

### ***The moral duty to mentor others***

Many successful surveyors have thrived without education. Typically, that’s because they were lucky enough to encounter an incredible mentor who helped shape their future.

While mentorship is still incredibly important, good mentors—like formal surveying educational programs—are becoming fewer and far between.





IMPROVE  
DEVELOP  
TRAINING  
MOTIVATE  
COACHING  
INSPIRE



That's why the surveying profession truly does need a combination of education and experience under mentorship to see the best success.

"The loss of mentoring is a trend that parallels our technology," Todd said.

"We went from taping everything and doing control work with invar tapes and things like that. And we got an EDM. Wow. Crew size started shrinking. And by the time I showed up doing survey in the early nineties, if you had a three-person crew, you're working for the state. And if it was a two-person crew, that was everybody else. And now we're down to one-person crews."

If you're on a one-person crew, that means you're flying solo, with no mentor or coworkers insight.

"I see mentoring as something that we have to replace somehow. And I think the apprenticeship models are a great way to do that," Todd said.

If we can't do mentoring in the same way we did in the past, that means we need to find new ways to impart those same lessons.

Apprenticeships or structured training programs like those that exist in parts of New York and California could be part of the answer. Because the reality is that multiple-man crews will not return anytime soon due to economic factors and a shrinking surveyor workforce overall.

"Maybe state associations are standing up their own training programs. Maybe it's not even a formal apprenticeship, but maybe it's a matter of saying, hey quarterly, we've got this cadre of talented surveyors who are also pretty good at teaching. And we're going to have technician camp once a quarter in different corners of the state," Todd said.

"An adage that I have learned, and it doesn't just apply to surveying, is 'match the tool to the task.' And when it comes to education, sometimes we're going to start with the tools we have. I know that not every state has the ability to stand up an educational program, but they do have talent. Talent within their professional associations. And I believe as a profession; we have a great opportunity ahead of us to cultivate that talent."

As surveyors, we have a moral responsibility to help pass the torch to future generations.

Creating quality learning opportunities, both inside the walls of a classroom and out, will be the collaborative task that faces community colleges and professional organizations in the future.

*Editorial notes: Mr. Jim Coan, cited in the article and was part of this podcast, unfortunately, passed away on August 8, 2021. Jim was a gentle giant in the profession and a huge advocate for education and mentorship. Jim will truly be missed!*

*There was also mention of the lack of land surveying college programs in the United States. There are more than you think available. Check out the list compiled by Heather Keenan for the Nevada Young Surveyors Network and the [www.landsurveyingcareer.com](http://www.landsurveyingcareer.com)*

<https://www.google.com/maps/d/u/0/edit?mid=1zJp3MSGCxBZVpqwnRwXKclUULzJim92W&ll=39.03463421580769%2C-100.44850335000001&z=5>



# 6 Ways Young Surveyors Can Thrive in a Changing Profession

*Prepared by Trent J. Keenan*

When Michael Magyar goes on vacation, he does something unusual: he looks up surveyors in the local phone book wherever he's traveling.

The owner of Magyar Land Surveying LLC in Oregon, Michael, says it's become more and more of a challenge to find surveying offices where professionals are open for business and answering phones. In fact, the majority of fellow surveyors in Michael's Oregon community are sole proprietors headed for retirement—with no one ready to take over their business when they're done.

All over the world, the picture is the same. As a result, the number of surveyors is declining rapidly. That's why it's more important than ever to entice new surveyors to the profession and support them on their journey to becoming skilled technicians, licensed surveyors, classroom instructors, or any combination of the above.

Whether you are an aspiring surveyor or an established one, what follows is advice from four surveying professionals on how young people can enter the surveying world and succeed.



## ***1. Recognize that Surveying Has Career Potential***



Brandon Montero teaches construction surveying at Arizona State University and is the Program Director at Elevate Construction. Out of the 80 students in his current class, only one student plans to become a surveyor.

"Most of them are looking at the construction management path. And they're thinking, okay, what makes big money?" Brandon says. "They don't feel that that's something that they can earn in the surveying industry."

College students are often attracted to the high earning potential of a superintendent position or engineer, but the truth is that there are both financial and non-financial perks that come with surveying—if you are not obsessed with instant gratification.

While it's true that you might earn \$2 more per hour if you choose a construction path versus a surveying path right out of college, from a long-term career aspect, there are other considerations.

"Be aware of where you go for the quick dollar versus what is actually going to benefit you. Because the benefits of a career and establishing yourself will in the future outweigh that," Brandon says.

Important considerations when embarking on a career path include the view of your employer, the mentoring they offer, and their plan for you in the future. In addition, asking big-picture questions early in your career journey may guide you past the allure of immediate earnings.

There's also the fact that surveying can indeed pay a healthy salary that can compete with roles like civil engineering—and it may be possible to advance faster on the pay scale, particularly in a profession with few bodies and sky-high demand.

## 2. Learn to and Ask Questions

Success in surveying relies on mastering foundational knowledge. It also depends on learning to think critically and ask the right questions.

Peta Cox is the National Training & Development Manager at Consulting Surveyors National in Australia. A surveying instructor, Peta's students are surveyors early in their careers, typically anywhere from two months to two years into the profession.

"Some of the basic stuff that I'm teaching them right now, they're doing out in the field, but they do not understand why they're doing it," Peta says.

Her goal is to change that by encouraging students to think about how to think about tasks past the surface level.

"Instead of just getting a bit of data onto your data recorder and going out and setting out or picking up, they're using their brain and thinking about what they're actually doing out there, and how they can check things while they're out there instead of just being the monkey, picking it up, sending it back to the office, and getting somebody else to look at it," Peta says.

While the classroom curriculum itself consists of immediately useful items and items that students may not use for years, Peta says the goal is to go beyond the curriculum and hone problem-solving skills.

Peta described one student who was having trouble getting direction at work. She told him it was his project, so he needed to take charge and organize the necessary meetings to help the project move forward.

"That afternoon, he went and did it, taking that step. He's already learned that he can't sit back anymore. He needs to start moving forward and being responsible," Peta says.

The ultimate key to unlocking critical thinking is learning how to own up to mistakes and ask questions that help you improve.

## 3. Hone Soft Skills



Learning to ask questions isn't a technical surveying skill. Instead, it's part of a broader array of "soft skills" that are nevertheless critical to advancing in any profession—surveying included.

"I think soft skills are the real answer for the surveying industry and that they are extremely under-promoted. If we're ever going to get anywhere, it's going to be through soft skills," Brandon says.

Soft skills include the ability to do things like:

- Communicate well with owners and project stakeholders
- Reliably check in at the start and end of site visits
- Mentor colleagues and employees

Whether you are out in the field, at a construction site, or answering phones in the office, those soft skills can turn a mediocre surveyor into a talented surveyor that other professionals are eager to work with or hire.

Michael's decades of experience have proven to him that soft skills are essential.

"If you don't know how to communicate effectively with people and guide people through very complex and convoluted pathways, you're not going to have that role as a leader and as a good consultant," Michael says.

Developing soft skills happens over time, and you can't always teach them quickly and efficiently in a classroom. Yet highlighting the value and long-term importance of soft skills is critical.

## 4. Understand How Classroom and Field Skills Work Together

In the surveying profession, it's common to hear arguments about the value of classroom knowledge versus the power of on-the-job experience. Of course, both serve a purpose, but it's nearly impossible for surveyors to agree on how much.

Ray Lillibridge is a PLS at OHM Advisors and an adjunct professor at Lawrence Technological University and Eastern Michigan University. His perspective is that a profession like surveying requires some type of classroom education.

"I had an entire semester in writing legal descriptions," Ray says. "Does it still need to be that way? Yes. Because there are very important considerations when it comes to legal descriptions. That is a boring class, but you've got to do it."



For example, an entire semester could easily be spent teaching a class how to lay out parking lots. But in order to take that course, you would first need prerequisite classes that teach you what control is and how it's set.

Whether that learning happens in a classroom environment or not ultimately may not matter. Yet a distinct element of “teaching” is necessary for young surveyors to succeed. And while you could have one member of a two-man crew teach the other, it can certainly be effective to teach 12 surveyors all at once in a classroom setting.

Playing devil's advocate, Michael said that probably only 10% of what he does as a surveyor today was learned in a classroom.

“I don't think I really figured out what I was doing until I hung my shingle and had to own it. And I had to own every gesture,” Michael says.

But to be fair, that statement comes from the perspective of having 35 total years of experience under his belt. The metaphorical percentage point has been an ever-changing mark over the past decades.

“If I think about what experience I needed percentage-wise to do my work for the first 23 years, I could probably get all of that from school. But to do what I do now, 10%,” Michael says.

Brandon agreed that the importance of education and experience is balanced somewhere on the scale.

“The regulation for filing a property or how to subdivide, all of those are things that are written down. And anything that is written down can be taught. But what made us proficient or even remarkable in our careers was the experience, hands down,” Brandon says.

That's precisely why the surveying profession must focus on finding ways to teach experience effectively. In an ideal world, passionate surveying professionals should write books, consult, and spread their wisdom across multiple companies or state lines.

### ***5. Hone Expertise With or Without a***

The next area of contention in surveying is whether the surveying experts qualified to spread that type of wisdom must be licensed professionals. Interestingly, many surveying instructors are not licensed or do not practice actively in the field. On the flip side, many excellent licensed surveyors are lackluster teachers.

While the debate is fiery, the bottom line is that it is possible to be an incredible surveyor with deep expertise without possessing a license. For example, Peta says that surveying instructors do not have to be licensed in Australia. But she argues that she certainly feels qualified to teach.

“Many of us in the system have worked with registered surveyors, have worked on construction sites, have worked on roads, have done all of this different stuff. We haven't learned the educational side as you would in a university, but I learned from the surveyor that I worked with for 10 and a half years: how to run the business, order the plans, and define boundaries. So I could do it; I'm just not licensed to do it,” Peta says.



Ray said that it is also possible to teach college surveying courses without a license in the United States.

“There are many colleges that have non-licensed surveyors teaching surveying. I can think of a handful of colleges in the Midwest where civil engineering teachers who are not licensed surveyors are teaching survey curriculums,” Ray says.

But again, the question arises of whether or not having that license matters.

“I believe that there are people with a license that I could survey a circle around, and I feel confident saying that. And there are people that I can't,” Brandon says. “But that license says he knows what he's talking about, at least to a certain point.”

Ultimately a license is a helpful benchmark for the industry, but we must keep in mind that it is no guarantee of skill. There are many ways of gaining expertise in the profession, and we should explore ways to honor that fact where possible.

### ***6. Don't Make Professional Development a “Checkbox” Item***

One logical path for surveyors to hone or expand their expertise is to pursue annual professional development opportunities, from courses to certificates to conferences. In fact, it's often a requirement of State Licensing Boards that a certain number of credits be obtained each year.

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Peta says that in New South Wales, professional development is valued almost to an extreme: every registered surveyor has to get a certain amount of professional development points each year. If they don't, they lose their license until they make up the points and reapply for it.

Yet while it's easy to check professional development off the list quickly, it's harder to learn from it and spread that learning to benefit others.

"The point of that is that you come back with that skill set and then pass it on to people. Pass it on to the people that you're mentoring. You should go back to your company and be like, 'All right, surveyors! Gather round,'" Brandon says from a mentoring standpoint.

From a business owner's standpoint, professional development can also provide you with a key edge. What you learn could help you refine your current practices, expand into a new market, or learn about new and cutting-edge technologies.

### ***Parting Thought: Surveying May Change but Will Never Disappear***

While it's clear that surveying is headed towards a pivotal moment due to mass retirements and few fresh faces, the profession is guaranteed to continue in one form or another. Buildings still need to get built, and the project must be completed. But the bottom line is that the greater industry will find a way to forge ahead.

Moving forward may not happen in an idealized way, but it will happen. It may mean that large contractors will begin to take surveying seriously and work to establish their own survey departments. In fact, change is already starting to happen if you look closely. Positions such as "field engineers" are becoming popular, which are nearly identical to a surveyor in many ways.

Neither new technology nor run-of-the-mill engineers will replace the value of a professional surveyor. The answer to the surveyor shortage lies in making smart programs and alliances that pass on surveying wisdom to future generations. others.

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# The Role of Mentoring in Land Surveying

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*Reprinted with permission of the Nevada Land Surveyors Association, Nevada Traverse, Issue 48.4. [www.NvLandSurveyors.org/nevada\\_traverse.html](http://www.NvLandSurveyors.org/nevada_traverse.html)*

*An abstract of The Geoholics Podcast – Episode Geoholic Anonymous from September 27, 2020*

In any industry, there is perhaps nothing so formative and influential as a great mentor.

This is particularly true in the land surveying profession, where unique laws govern each state and various project sites lie around every corner.

We gathered several veteran surveyors to share their thoughts on the role of mentoring and how it can be best facilitated in the modern world.

*How do you define mentoring?*

Some people define mentorship as a professional coach.



But a deeper meaning of mentorship is an expert guide who is actively seeking to give back to the next generation.

That's how Trent Keenan, Rob McMillan, and Brandon Montero conceptualize it.

Trent is the owner of Diamondback Land Surveying and the founder of the popular Mentoring Mondays program.

"For me, mentoring is basically giving back to the profession and honestly expecting nothing in return, except for creating another generation of surveyors that will continue what we're doing and the legacy that we're doing," he says.

Rob works for the California Department of Transportation and is the president-elect for the California Land Surveyors Association. As far as he's concerned, a mentor role isn't a teacher; it's in a special league of its own.

"It's a different niche. I've benefited from a long list of mentors. Some who I didn't realize were mentoring me at the time, and then later I get faced with some kind of situation and my response was what I learned from my mentor five years earlier," Rob said.

Now that he has been a surveyor for over 35 years, Rob's finding a clear passion in seeing his mentees achieve success.

"Mentoring is critical, absolutely critical to land surveying. Historically our profession is described as the art and science and technique of location. And that art portion is really difficult to master in a classroom. And it's not much easier to master in the field in today's work environment. There's a lot of information for people to learn, and subtle nuances are the keys to success," said Rob.

Brandon Montero is a senior survey manager at Oakland Construction in Arizona and a training consultant for Elevate Construction.

He added that mentoring goes beyond expertise; it's also mastering the daily reality of surveying over the theoretical.

"Sometimes over the course of our career, we develop that secret sauce for the way that we do things or why we do things. And so passing those things, on versus just the book-smart knowledge. And then really understanding how the tasks that we're doing support the overall craft. We're not just doing tasks for the sheer force of completing that task and checking it off a list," Brandon said.

Brandon likened mentoring to the factor that helps fellow professionals truly thrive versus just getting by.

"We could picture a plant just coming up in a patch of dry dirt, all by itself. On its own, maybe it'll thrive. Maybe it's going to make it,



depending on the conditions. Or, could we add water regularly? Could we add nutrients regularly? Sure it could grow on its own, but could it really thrive? Could it shoot up at a faster pace? Could it out bloom the competition?” Brandon said.

The bottom line is that the more we invest in mentorship, the more we equip the next generation of surveyors for lasting success.

### ***Mentorship bridges the classroom with the real world***

There’s no question that classroom education plays a valuable role in preparing individuals to think critically and to introduce budding surveyors to new concepts and innovative technology.

But the gap between theoretical book knowledge and boots-on-the-ground knowledge must be bridged.



Mentoring can be the glue that allows that to happen.

Trent, whose daughter is studying surveying in college, has seen firsthand just how quickly curriculum is taught in school today.

For instance, she spent three to four weeks learning about bearings and distances, and then it was quickly time to move on to the next topic.

“There are certain things on the academic side of things where I see that the mentoring world really needs to be on the back end because they’re having to go through school so fast and learn the subject matter so quickly that they don’t fully understand it. They’re just getting the most basic understanding of the data,” Trent said.

That’s not even factoring in the reality that sometimes, the surveying technology is changing faster than schools can update their curriculum to match.

This means that mentoring and real-world experience takes on an even greater role and is ideally something that occurs during formal schooling as well as afterward.

Brandon is currently teaching Construction 201 at Arizona State University as part of the construction management degree.

“We’re teaching survey math; we’re teaching Traverse Computation, the principles of precision and accuracy. I would say that the fundamentals are being taught. But we all know that there’s a difference between something that’s conveyed to us theoretically,” Brandon said.

“Getting your hands on a piece of equipment and maybe leveling it up for the first time in your life once is not equal to the amount of experience that you can gain when you’re out in the field.”

The realm of the classroom can be thought of as teaching you the building blocks: math, specific concepts, and the history of the profession.

But breaking away from the confines of the syllabus and learning how to put it all together requires experience—preferably with a mentor to help shepherd you along the way.

“I would even think about robotic total stations or GPS, whatever is the most current, the newest, the flashiest. Someone coming up in their career might see that as *the* tool, the most precise tool. But somebody that has the experience and has done things, the old methods, conventional methods, et cetera, they might look at that as one of the tools that they have in their toolbox,” Brandon said.

Mentors can help young surveyors understand their toolbox, both figuratively and literally, in order to know what tools they need when confronted with a real-life task.

### ***Technical expertise is not the same as mentoring***

Despite the element of technology in modern surveying, the value of mentoring transcends the need to be up-to-date on the latest innovations.

Yes, a new surveyor coming out of college may have more knowledge about a specific new technology than you do. But the veteran surveyor has a mastery of the broader principles that make surveying tick.

“Technical expertise is not the same as professional mentoring, helping someone grow to be a professional, to help them integrate with clients, to help them communicate with a project team, versus technical expertise, totally different. But the sum of both of those things is what makes someone an amazing employee, an amazing professional,” Brandon said.



Professional mentoring means helping your mentee navigate the professional side of the surveying world, which means bigger-picture thinking beyond helping them succeed in day-to-day jobs.

“Are you teaching them how to move ahead in the company, as far as the way they integrate with the project team? That professional mentoring is a big thing. Directing them to resources or books like *How to Win Friends and Influence People*? Some of those ground-up things, the building blocks of being a professional, is a totally separate world from technical skills,” said Brandon.

No surveyor is going to be an expert at every single facet of surveying, and that’s certainly not a requirement to be a good mentor.

“Before, it was the traditional boundary, Topo and staking. We’re long past those,” Trent said.

But while you may not be an expert in LIDAR or UAV, but as a professional, you learn to focus on what you’re best at and navigate the other silos within surveying, subcontracting out work as necessary.

### ***3 steps to building a good mentor-mentee relationship***

A rewarding mentorship is a two-sided affair.

It takes a mentee who is eager to learn and dedicated to growing and improving to further their career.

And it takes a mentor who is willing to learn their mentee’s career objectives, figure out how their mentee learns and absorbs information best, and put in the time necessary to help them move the needle on those goals.

#### ***#1: Learn your mentee’s goals***

First off, being a mentor doesn’t necessarily mean dragging your mentee down the exact same career path you took.

Your mentee may have a specific vision for what they want out of their professional career, or they may need your help imagining the options available to them.

Not all mentees will have the goal of becoming a licensed land surveyor. Some may be setting their sights on being a survey technician. That’s why the first step is to have an explicit conversation in which you ask what their goals are.

“A good mentor is definitely just coming up with a plan understanding the mentee’s goals, and really pushing the mentee to be able to ask the questions or want to be able to go after this profession,” said Trent.

#### ***#2: Learn how your mentee communicates and learns***

The next step is to get to know your mentee in terms of how their brain operates to help them thrive professionally.

“Understanding how your mentee communicates or learns is huge. Are they a person who learns by listening? Are they a person who learns best by looking at diagrams and seeing things explained and pictures? Do they need to put their hands on something for it to get down into their memory?” asked Brandon.

We all have ways that we communicate that come naturally to us, that’s part of the mentor’s role is to figure that out.

This isn’t rocket science and doesn’t require a teaching degree. It simply means paying attention to how your mentee absorbs and retains information.

This step is also important because, just like some romantic relationships, some personality styles just aren’t compatible.

It’s better to recognize that clash earlier rather than later. If your type A personality doesn’t mesh well with your mentee’s personality, it’s to your benefit to connect them with another professional you may know who would be a better fit for them.



### ***#3: Check in with your mentee regularly***

Once you establish a relationship and know a bit about where your mentee wants to go professionally, the final step is just to be there for them.



Again, a mentor is not a teacher. You don't need formal lessons plans and quizzes to feel like you're making progress. You just need to be there for your mentee when they need you.

"The mentor-mentee relationship isn't so much about what the mentor can teach that mentee, but how the mentor can help guide that mentee to their ultimate destination," Rob said.

The most important ingredient to a successful mentor-mentee relationship is time.

"It's going to take tons of time and devotion. Hourlies or weeklies face-to-face, lots of time and dedication," said Trent.

At the beginning, your relationship might be more time-intensive as you get them on their feet.

As time goes on, it will be less structured, but communication should still be regular, even if it's just an hour per month spent on more high-level questions and topics.

"If you've got staff that you train, you don't spend every day looking over their shoulder. You put them on a task, and then you check in periodically. And it's the same thing with mentees," Rob said.

### ***The impact of one-man surveying crews***

One major impediment to the ability to create mentor relationships is the sharp rise in one-man survey crews.

Due to cost, personnel shortages, new technology, or all of the above, one-man crews are becoming the new norm. This means limited time for new and veteran surveyors to work side-by-side.

"Every time there's a major leap in technology, the number of people in the survey party has declined. This has reduced the opportunity for new staff to learn from others as a part of the day-to-day work," Rob said.

"Because of that, we're losing the opportunity for daily transfer of the tacit knowledge, as a matter of course. I guess the fancy way to say that is the training hierarchy has been decimated."

If one-man crews are the new normal at your company, it means that mentoring cannot be as casual and organic as in decades past. It needs to become part of your business plan.

"We have weekly meetings where we go over how we are doing as a department, but also root cause analysis. Being really honest about the mistakes that we've made. Training moments where we go over let's reassess some of this math that maybe we haven't talked about in a while," Brandon said.

As an organization, you need to consider how you are going to counter-balance the isolation of the one-man crew setup and allow your crew to develop as professionals in other settings, whether that's weekly meetings like Brandon described above or something else.

### ***Online mentoring opportunities***

Thankfully, as one-man crews have risen, so have online mentoring forums.

Today, you can mentor on Zoom. You can mentor on a phone call. You can join a surveying Facebook Group. Or you can join formal networking events such as Trent's weekly Mentoring Mondays sessions.

Mentoring Mondays takes place every Monday on Zoom and features a live presentation and PowerPoint led by a surveying professional, followed by a Q&A.

Several meetings have lasted over two hours, thanks to the discussion afterward, which is a clear sign that many surveyors out there have an appetite for the community, dialogue, and informal continuing education led by their peers.

The Mentoring Mondays discussion portion often brings rise to new questions and topics, which then become featured topics for the meetings that follow.



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Online platforms also lead to an exciting diversity of geographic locations and backgrounds. If you get creative with technology, you can also do things like draw on the screen, do math problems, and show photographs and boundaries.

Brandon's company, Oakland Construction, hosts events like week-long boot camps that focus on technical training and professional development.

"They do one-day technical trainings on the use of a builder's level, use of a total station, things like that," Brandon said.

When companies build professional training into the business model and into the workweek, it sets the tone that professional development and keeping skills sharp is valued.

"It's really easy to expect our guys sometimes to go and do self-help or professional development on the weekends, or, Hey, maybe we can get together on a Saturday. But when you don't pay somebody to do something, you might as well just tell them it's not that important," Brandon said.

Being a mentor can seem intimidating or too time intensive. But the truth is that there's almost nothing more important than sharing your hard-won expertise in whatever ways you can.

Sometimes, it's as simple as getting out of the way and letting other surveyors do the work you're best at, letting them fail, and then taking the time to explain what they should do differently next time.

You need to make a conscious choice to become a mentor. But it's a choice worth making.

Mentorship can go both ways, and you're learning as you go.

For mentor and mentee alike, the relationship is always a win-win.

***Mentors:***

***We make a living by what we get, we make a life by what we give – Winston Churchill***



# Women in Surveying: How Empowering Women Will Empower the Profession

*Prepared by Trent J. Keenan, PLS, Anna Rios, RPLS & Kristina Poulter*

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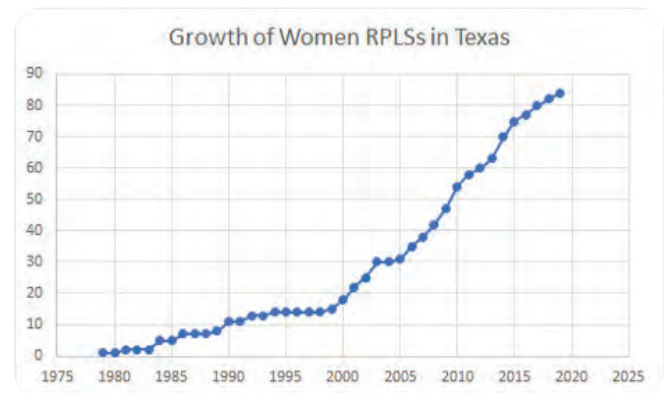
*An abstract of The Geoholics Podcast Episode #83 and Mentoring Mondays Week #36*

In any given state across the USA, women surveyors account for approximately 3% of the surveying workforce.

Given that small percentage, it's hard to believe that the number of women surveyors has skyrocketed in most states since 2000.

Anna Rios, RPLS, is the Owner of Aerios Geo LLC. She's also the founder and president of the Women Surveyors Summit.

Today, she's on a mission to provide female surveyors with the support system, network, and mentorship opportunities that she wished she'd had when she started surveying two decades ago.



## *A woman's path to surveying*

Anna began surveying 20 years ago by accident when a temp agency placed her in a secretary role at a surveying company. By chance, the company was owned by a unique individual: the first registered female surveyor in the state of Texas.

Anna quickly fell in love with the profession and pursued a degree at Austin Community College. Unfortunately, it was a rocky road, with her degree program almost canceled due to low enrollment.

What inspired her to stay the course was connecting with other women.

"There weren't very many women in the profession at that time, and there still aren't enough," Anna said. "Oftentimes, you're the only woman in a room full of men that are surveyors - or in the field, or in an office."

Her good fortune led her to work under another woman surveyor after obtaining her degree. That company paid for her to become a member of the Texas Society of Professional Surveyors.

Soon after joining, she was nominated as secretary-treasurer for her local chapter, followed by the role of president, followed by an additional role as the Texas representative for the NSPS Young Surveyors Network. She eagerly embraced each new opportunity.

All this time, apart from the two women surveyors she had worked under, Anna was surrounded by male surveyors day in and day out. Then, in 2016, Anna had attended the Young Surveyors Conference and met several women surveyors from Minnesota.

"I finally felt connected and accepted as a surveyor, not just this one woman in the room. And I had been in the profession for 15 years at that point," Anna said. "Being in the profession for that long and never really feeling you knew where you fit in - it can be frustrating. You can be unsure of what you're doing. You can think about changing your mind over and over again, questioning if you're even in the right place."

The experience of connecting with fellow female surveyors was an inspiring one.

“That’s when I realized that I wanted to have a women’s summit. At some point, I wanted to gather the women that are in the profession, get them together, and let them know they’re not the only one in the room,” Anna said.

### ***The first Women Surveyors Summit***

Flash forward to 2019, and Anna finally found herself in the position to make that dream a reality.



*Women Surveyors Summit*

The president-elect of the Texas Society of Professional Surveyors approached Anna and said that she had a willing sponsor for a women’s summit. She was hoping Anna would take the lead and make it happen.

Within just six months, the event was organized. With the support of TSPS and the TSPS staff’s assistance, Anna planned to start small the first year, setting aside space for 30 women to gather in Austin, Texas. The event sold out in just three days, even after doubling the number of attendees allowed.

The final attendee count was 65 women from 10 states, thanks to some creative workarounds in partnership with the local tourist office.

The inaugural Summit events included educational courses, a guided tour of the Texas general land office, and a panel discussion on workforce development and diversity. After a full day, there were social excursions to local breweries to enjoy.

“It was not just about the connection. It was also about creating visibility of women in the profession,” Anna said.

“I think it’s been a long time coming. Right now, there are more and more women that are in leadership positions and really passionate about sharing the profession with others.”

Heather Sides, RPLS and Vice President at LJA Surveying, couldn’t agree more. She appreciated the value of the summit’s keynote speakers and formal activities. But what really impacted her was the time outside of the classroom.

“There were conversations that we had that don’t typically happen when you’re hanging around a bunch of guys surveying,” she said.

In Heather’s mind, sharing mistakes is the Foundation of healthy mentoring.

“I like getting gritty. I like talking about those hard conversations,” she said. “Mentors that they can kind of look at and go, you know, we’re here. We’ve screwed up. Let’s learn from what I’ve done and kind of get a little gritty on stuff. That’s kinda what I’m looking for.”

Many attendees found just that. They quickly continued the professional bonding experience on a Facebook group that was formed after the event.



### ***The Future Surveyors Foundation***

It was clear that there was a demand for an annual Women Surveyors Summit. The next question became, how to fund it?

The answer came in the form of the birth of The Future Surveyors Foundation, a 501c3 non-profit organization focused on creating opportunity, inspiration, and support for the surveying profession.

Spearheaded by Anna, the Foundation’s goals go far beyond funding a gathering of female surveyors once per year. Instead, the bigger goal is to promote the diversity and health of the surveying profession as a whole.

“The foundation is really in place to help promote surveying, and bring that visibility for the profession,” Anna said.

To get the Foundation off the ground, Anna reached out to Heather Sides to join as a board member as Vice President, along with Virginia Winberg, PLS, as the Secretary/Treasurer.

“Being able to contribute to an organization like the Foundation, which promotes diversity in the profession, is really important to a lot of companies. And I think this is a great way for them to be able to do that,” Virginia said.



The Foundation offers four sponsorship levels for individuals or groups that want to support the Women Surveyors Summit. In addition, each level provides sponsor advertisement opportunities.

“One of the things that we are offering is to all participants of the Summit is an event t-shirt with the summit logo on the front and all of the sponsors’ logos and names displayed on the back,” said Virginia.

Those branded t-shirts will soon be the new wardrobe staple of female surveyors nationwide if all goes well.



### ***Meeting the need for mentoring***

Both the Summit and the Foundation serve to underpin a more global need: the importance of mentors in the surveying profession.

“I really struggled to find a true mentor. I think mentors in surveying are sometimes hard to find, whether they’re too busy to really help you or too busy to guide you,” Anna said.

“A lot of surveyors, especially the older generation, they got into surveying, so they didn’t have to deal with very many people. So sometimes they just aren’t very good at communicating or working with others. And sometimes they just don’t know how to support the younger generation.”

Even more than her status as a woman, Anna felt the void of not having a mentor to help guide her along the way. When she questioned where she fit into the profession, a mentor could have helped ease those fears.

The goal of both the Summit and the Foundation is to begin formalizing the process of filling those mentorship gaps.

“Anybody that’s interested in the profession, we need to support those people because we need them. Retaining staff and workforce has been a big issue because there are so many people that just kind of get thrown into the fire, and it’s a sink or swim type of situation, and they’re not really supported,” Anna said.

Virginia couldn’t agree more.

“One of the things that I’m passionate about is being involved in STEM events and attending high school career fairs; promoting the profession that way. So, I’m hoping that the Foundation is able to help support either financially or provide information, content, material to other surveyors out there, giving them an opportunity to volunteer in that way as well,” Virginia said.

Virginia’s personal goal as a board member of the Foundation is to help create that network. She hopes this will make it easier to find speakers to tap for various events and educational opportunities.

“I think we can all agree how important mentoring is in this profession because you really need to have that continuity across generations of surveyors. You have to know that history and that background,” Anna said.

In Anna’s mind, it’s all about cementing that bridge between young and senior surveyors, old and new methodologies, and historical and high-tech skills.

### ***The 2021 Summit***

The 2021 Women Surveyors Summit just wrapped up on July 22-23. The summit had over 100 attendees registered, from over 30 states and 4 countries, making it an international event!

It was set up as an interactive virtual event, which means the number of participants possible was much higher than the inaugural 2019 event (the 2020 event was canceled due to COVID).

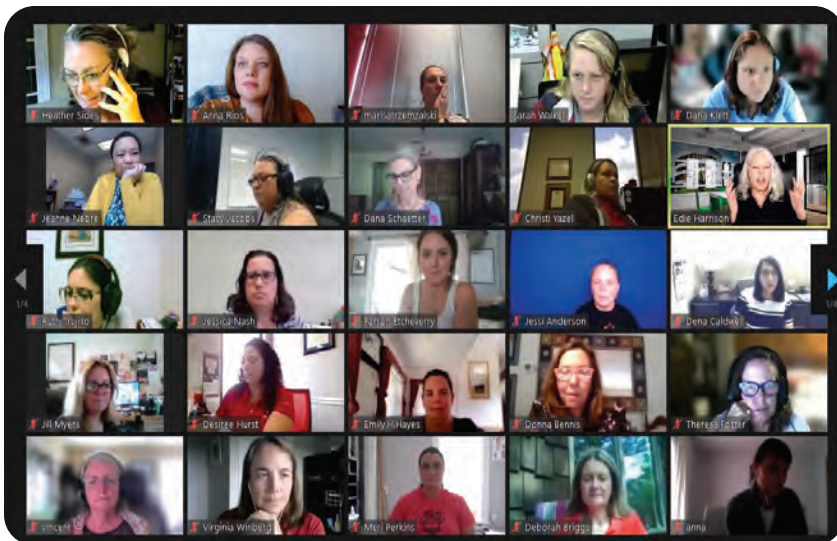
Anna kicked off the welcoming session, followed by a corporate trainer, Edie Harrison, who ran a workshop on difficult conversations.

“I think we all struggle with that, men and women both. But specifically for women, sometimes it’s hard for us to ask those questions, or to negotiate properly, or to come back and say, ‘Hey, you know, I need more money’ for their salary,” Anna said.

There was also be a diversity panel discussion and update from Get Kids Into Survey, breakout groups, and more.

“People don’t want to sit in front of their computers all day long. So we kind of broke it up into a couple of days and did some specific fun things during the days, but still tried to give us some time that we can do that networking,” Heather explained.

A two-hour happy hour provided ample time for fun and networking.



Through it all, the spotlight was on surveying, and the powerful women across the country who are helping it happen.

“It was really, really powerful to hear a lot of people’s stories and the things that they are passionate about,” said Heather.

“We’ve got a whole lot of generations that are going to have to follow in our footsteps. We need to make sure that they know where we’re going, and where we’re walking, and where we’ve been,” Anna said.

### *Goals of the Women Surveyors Summit*

- Provide support to women in the profession – We want the attendees to leave summit feeling supported and accepted as both a surveyor and a woman in a historically male profession.

- Create visibility and acceptance of women in the profession.

It’s a poignant mix: the Summit is about surveying, it’s about women, and most importantly, it’s about a passion for giving back.

Follow the Future Surveyors Foundation on Facebook, LinkedIn, and Instagram

To support the Summit, email [info@futuresurveyors.org](mailto:info@futuresurveyors.org)

Anna Rios, RPLS, is the Owner of Aerios Geo LLC. She is a member of both the National and Texas Society of Professional Surveyors, former Texas Young Surveyor State Representative, and recently served as an Adjunct Professor for Austin Community College. She remains active on many committees to promote the Land Surveying and Geospatial profession. Anna has been in the surveying profession since 2001 and her background includes experience in a wide variety of surveying services encompassing commercial, residential, and municipal projects. She is licensed in Texas and received the Texas Young Surveyor of the Year award in 2019. Anna earned her Certificate of Land Surveying/Geomatics from Austin Community College in 2005 and her Bachelor Degree of Science in Business Administration from LeTourneau University in 2015.

## *Women Surveyors Summit*

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# The Concerns of Young Land Surveyors

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*Reprinted with permission of the Nevada Land Surveyors Association, Nevada Traverse, Issue 48.2. [www.NvLandSurveyors.org/nevada\\_traverse.html](http://www.NvLandSurveyors.org/nevada_traverse.html)*

*An abstract of The Geoholics Podcast Episode #76 from April 4, 2021*

When you get bit by the surveying bug, it's safe to say that you're bit for good.

Those with a passion for the profession look at the world in a whole new light. Every job site you walk, every vacation you take - whether you're on the clock or not, your surveyor's brain is working on overdrive.

Surveying today is marked by a generation of experts who are close to retirement.

But there are younger surveyors in the ranks. Some of them are concerned about the profession. Some are optimistic. Most are a little bit of both.

On a recent episode of The Geoholics, host Kent Groh and Ryan Kelly hosted three young surveyors: Farrah, Zach, and Adam, to chat about what's on their minds.



**Farrah Etcheverry** is the co-owner of Etcheverry Land Surveying. Founded by her father, Farrah joined the firm when she started helping out six years ago and was soon sold on the profession hook, line, and sinker.

**Zach Hogan** has been surveying for three years. When a friend mentioned a job opportunity and asked Zach to sign some paperwork and start at 6:00 a.m. the following day, he jumped at the chance. He quickly gravitated to the boundary side of surveying and fell in love with the sense of history.

**Adam Marmoljo** started his career in civil engineering before switching to surveying after speaking with several professional surveyors. After thoroughly researching job opportunities, pay, and licensure requirements, he decided to take the plunge and hasn't looked back.

## ***The problems facing surveying:***

It may seem uninteresting to state that a generation of surveyors is close to retirement. In any other profession, it might not matter. But in surveying, it does.

The average age of a licensed surveyor in the United States is roughly 59 years old.

In every state in the country, the number of licensed surveyors is on the decline.

While it's clear there is a shortage of surveyors, the question of the hour is, why?

A few things stand out as potential factors in the surveying puzzle.

- Land surveying is not a visible profession
- Education requirements are not standardized
- A mentor system is critical
- Digital resources are scarce

This article will not provide all the answers. But it will dive deeper into each of these problems, pulling together a bigger picture of the surveying puzzle.





### ***Make the profession visible***

For better or worse, surveyors often fade into the background.

Not as high-profile as most engineers or architects, surveyors often work behind the scenes.

Many surveyors do not loudly advertise what they do or engage in heavy marketing campaigns for their businesses.

The truth is, in the past, it often was not necessary. Members of the public knew when they needed a land surveyor, and they knew how to find one.

But that convenience is not as helpful now that most young people have no clue what a surveyor does.

Kent Groh recalled visiting a school to conduct a recent presentation. He asked the roomful of 600 kids if they knew what a land surveyor did. Only one girl raised her hand.

### ***Talk up surveying every chance you get***

Farrah landed in the surveying profession thanks to her father, a surveyor with a firm of his own. If she had not had her dad to look up to, Farrah doubts that she would have been aware of surveying as a career path. That is why she thinks one key is for current surveyors to speak up about what they do to friends, acquaintances, and youths.

“If you don’t have a parent or somebody really close to you who’s good at what they do in surveying and who likes it, you just won’t find out about it,” Farrah said.

Most surveyors have limited time on their hands, so the first key becomes making time.

“There has to be enough people that have been doing it long enough that are willing even to go in and talk to the kids about it. And we are even having a hard time finding seasoned professionals that are willing to go and take the time to try and talk to young people. So, it’s a struggle for sure,” said Farrah.

### ***Focus on the fun!***

When getting in front of a younger audience, Farrah, Zach, and Adam agreed that the important thing was to make it as engaging as possible.



This applies whether you are talking to young children, such as a Boy Scout or Girl Scout troop, or older kids such as high school students ready to think about their careers.

“I think it definitely takes a special type of person. So, for myself, I love puzzles. And I feel very fulfilled with physical labor,” Zach said. “So, I think you need a special type of student or a younger person that enjoys going on adventures every day. If you look at it at least from the boundary side, you look at it as treasure hunting in a way. And when you are going out and finding some really cool stuff, like rebars that were set by some guy back in the eighties,” said Zach.

In order to instill excitement and interest in surveying, you need people who are excited by surveying to talk about it. That way, the passion will come through, and you can pass on exactly how exciting and fulfilling surveying can be.

Adam agreed that he wishes he heard about surveying sooner - if he had, he would have looked into it much earlier in life.

“I think reaching younger people through high schools, you know, I think that’s a perfect age to go and recruit in that way. Because if that would have been presented to me, I would have definitely taken an opportunity to join a surveying firm,” said Adam.

Suppose you cannot physically get into classrooms to make a presentation. In that case, the answer might lie in something like social media - because right now, surveying isn’t much more visible online than it is offline.

“I did a lot of research before I went in surveying. There is not a lot of articles or even social media coverage, you know, surveying. You know, if you compare it to civil engineering, it’s quite the opposite,” Adam said.



Farrah drove home the point that creativity is critical.

“It’s pretty tough to come up with creative and unique and effective ways to reach people with something that you really can’t express in a classroom setting. The exciting parts of it, you know, 11, 12, 13-year-olds through high school, they don’t want to sit and listen to somebody tell them how much math they’re going to need to learn, or how many years of college they have to go through,” she said.

Instead, it is all about making things exciting and planting a seed that can grow with time.

### ***Standardize education requirements***

It may not be a popular idea. It may not even be possible. But one issue that is throwing off young surveyors is the noticeable lack of standardized licensing requirements across the United States.

Farrah described an acquaintance who recently moved from Kentucky to Ohio. A licensed surveyor in Kentucky, he struggled to get re-licensed after he moved to Ohio.

“It’s just funny because he was already licensed in another state, and yet he had so much trouble. Different states have different requirements that make it quite difficult,” Farrah said.

Adam agreed that he almost did not consider surveying as a career for this very reason - and he knows other young professionals who feel the same way.

“I think that has turned a lot of people off,” Adam said. “My friend, he was going to go into surveying. He loved the field. But when he found out there was inconsistency with Arizona having a degree, and Texas having just a two-year requirement plus experience, New Mexico having a four-year requirement - all of this inconsistency kind of worried him, you know.”

Ultimately, Adam’s friend decided to pursue civil engineering instead of surveying. Since he was paying for school out of pocket, a standard four-year engineering degree seemed like a safer return on his investment.

### ***The case for education***

Just because the varying education requirements throw off some young surveyors does not mean they don’t value it.



Adam made a strong case for requiring education, comparing it again to the civil engineering track for contrast.

“Civil Engineers, at least where I worked at, are really well respected. They earn the title, you know?” he said.

“They’re both licensed individuals that are protecting the public. So in that aspect, I think they should be equal.”

In addition to public perception, there’s an ever-changing technology landscape to consider.

“The way technology is going, you have to understand what’s going on,” Adam said. “GIS, you know, how coordinates are being made, what coordinates system are they using, you know, stuff like that. That’s the science behind it. I think it’s only going to become harder.”

While Adam fully supports the degree requirement, the challenge he’s faced personally is the fact that he is entering the surveying profession later in life.

It’s trickier to dive into the degree track when you already have a family than when you are just launching your career - yet another reason he wishes he had been exposed to surveying at a younger age.

“Now I feel like I’m kind of playing catch up. So I’m learning things, and I’m trying to learn things as quickly as I can,” he said.

The perk is that in the modern world, there are more options than ever to earn a degree in flexible ways.

“With online schooling and with everything with COVID, everything has been restructured. So I think it’s definitely more attainable. It’s just putting your efforts and your time towards those things,” said Adam.

Setting surveying apart as a profession rather than a trade is important to Adam at the end of the day.

“In my opinion, we are not a trade. It’s a special profession,” he said. “In today’s world, everything is school. Everything is based on the school. So, I think that’s number one to me. I think that’s key to making this a profession.”

It’s a strong argument – if surveyors want to be held in the same regard as architects and engineers, requiring a four-year bachelor’s degree makes sense.

### ***The case for hands-on experience***

While it is true that book smarts set a solid foundation and add an aura of professionalism, it’s also true that surveying is a “boots on the ground” profession, where it is possible to learn exclusively by doing – if you have the proper support.



Farrah’s opinion is that the hands-on track is valuable in its own right.

“Everybody’s college, college, college, you got to go to college,” she said. But the truth is that there aren’t a lot of dedicated surveying programs and colleges out there.

“I think that imposing a four-year degree is what’s part of what’s killing the young people from coming in. Unlike engineering, surveying is so much outside, so much exploration, just like all of you guys have said. And so we like to capitalize on that part,” she said.

Rather than compare a surveyor to a civil engineer, she sees no shame in comparing a surveyor to a tradesperson like an electrician or a plumber.

“Kids are graduating with massive amounts of debt, and they can’t find a job. So part of the appeal of the trades is to say, listen. You do not have to go that route. We have something better for you, and you can finish it under somebody who knows what they’re doing in a shorter amount of time and get right into the workplace, making good money, supporting your family, living out the dream,” she said.

Most surveyors that Farrah knows in her home state of Arizona got into surveying because they already had families and did not want to go back to college. But they still wanted to find a fulfilling career where they could make a great living and enjoy being at work.

Farrah’s own experience is a testament to that path.

She had been joining her father on a couple of surveying jobs for his firm, basically operating as a pack mule, carrying around supplies.

“I was kind of getting tired of just carrying this stuff. And finally, I said to him, can I just do that? I wanted to find where the point needed to go. I wanted to stake it out. I wanted to pound the hub. I wanted to store the data.”

It sounds simple, but Farrah’s father was taken by surprise. It turns out that not every potential surveyor takes that level of initiative.

“He told me, nobody has ever just said, let me do it. You know, they sit back, and they watch, and they observe, but so many people get nervous or too shy actually to have a hand at it,” she said.

For those with both a high level of initiative and zero desire to pay or return to the classroom, the answer is that they can simply move to another state with no formal degree requirement and pursue a surveying career that way. It may not be ideal, but it is an option.

At the end of the day, it comes down to passing an exam. Farrah doesn’t think it matters how you learn the material that helps you pass it.

“I think that there is definitely a place for higher education, but of course, probably out of everybody on the panel, I am the most pro mentor route. If it were up to me, there would be no four-year requirement.”

### ***Create a mentor system***

Regardless of whether the bulk of learning takes place in a classroom or in the field, a mentorship relationship is something that many young surveyors crave.

Zach particularly felt the desire to find an excellent mentor to get his surveying career off the ground.





“I don’t even know some of the questions to ask because I’m really new at this. So it’s like, you know, in a way, it’s my responsibility to learn, but it’s also the person that I’m working with or under; it’s up to them. If they want me to progress, you got to help show me the way. I don’t need you to hold my hand necessarily, but like here’s a little nudge,” said Zach.

If a more experienced surveyor doesn’t make the first overture, it’s up to the younger surveyor to take the initiative.

“You can’t be afraid to ask questions. That’s the biggest thing. You cannot swallow your pride. Even if you think it’s the dumbest question, ask it. You cannot meet the door. I can’t make any assumptions. Because as soon as you start making assumptions, it’s going to come around to bite you in the butt,” Zach said.

One of the first surveyors that Zach worked under was really good about protecting monuments, going the extra mile to preserve the mount stones and treat them like a piece of history.

For Zach, moments like watching that surveyor in action made the classroom experience and the field experience start to harmonize in a really nice way.

As valuable as mentor-mentee relationships are, they can be hard to come by.

One reason is that most experienced surveyors are so busy with their actual jobs that it’s hard to find time to give away to the younger generation.

But “mentoring” doesn’t always have to mean formal, time-intensive teaching.

Farrah recalls that when her father started his career, his boss would stick around for an extra hour at the end of most days and let him watch and learn one-on-one. It wasn’t formal teaching, but it was still valuable.

“You have to find the right person that is willing to really invest the time. And on the days where they don’t have as much time, to at least be willing to let you kind of hover and watch. And then maybe on the drive back, explain why they had to do what they did,” Farrah said.

Another growing issue is the increasing trend of one-person field crews. When you’re the only person on the job, it quickly becomes impossible to train the next generation side-by-side.

Zach recently took his growing desire for a mentor into his own hands and reached out to Kent Groh on Facebook regarding a mentorship opportunity. They ended up meeting up for beers to kick off the conversation.

Ultimately, if you rely on hands-on experience to solidify your survey skills, that experience is only as valuable as the mentor that is helping you along the way.

### ***Embrace the digital community***

It’s clear that time and resources are limited when it comes to meeting, educating, and mentoring young surveyors.



That’s why it’s perhaps more critical than ever to meet those young or prospective surveyors where they are.

Today, the place that most young professionals are hanging out is online – and this was true even before the onset of the global pandemic.

Case in point: Zach reached out to Kent about mentorship opportunities on Facebook.

Meanwhile, Farrah gets hundreds of likes on her surveying-inspired Instagram account, @lady\_land\_surveyoraz.

Adam agreed that social media is a natural area to focus on when it comes to both education and outreach.

"I think social media right now is the best way. I mean, I'm telling you, I did a lot of research. Since I am paying for school out of pocket, I had to do a lot of research before I made the decision to go into surveying. And I'm telling you, I didn't find a lot of info," said Adam.

Farrah suspects there may be an unconscious battle going on between educational content that's deemed acceptable - such as in the classroom, and content that's not, such as social media.

"I think there is a little group of people that have tried to create content that is survey related, but I feel like it all kind of funnels back into this idea of education," she said.

"For instance, a company reached out to me and was like, hey, what do you think about doing a couple of video courses on sort of the fundamentals, or how you begin being a surveyor? And so I put this up on my LinkedIn, and you can go and read the comments, and there was a good mix. But a lot of what I get and messages and comments is, well, you know, basically how assertive are you going to be?"

Comments were along the lines of: "you can't just teach people how to survey!" or "How dare you to think that you could create a video giving somebody the basics or the fundamentals!"

In a way, it's the mindset of an older generation. Across many professions, there used to be an aura of secrecy, with the instinct that company information and practices should be kept internal versus sharing them with the broader community.

But across industries, that's changing.



"Sometimes we do ourselves such a disservice by making it sound like it's some very deep and mystical thing that we do. And we have a magic walking stick that we carry around, and nobody else can possibly know how to do it without, you know, all these things being in place first. So we kind of shoot ourselves in the foot that way," Farrah said.

In the end, the more walls that come down and the more content that is circulated, the better.

That content doesn't have to be solely online on a social media page or podcast. And it doesn't have to be exclusively offline between student and teacher or mentor and mentee.

Education is powerful in all forms. And the more resources there are to learn about surveying, the better off the surveying professional will be.



# The Journey of Young Geomatics Professionals

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

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*An abstract of The Geoholics Podcast – Episode Geoholic Anonymous from October 11, 2020*

The average age of a surveyor today is approximately 60 years old. But there are new young professionals making their mark on the industry each year, and they are powered by a sense of energy and optimism.

Young surveyors and geomatics professionals were attracted to the professions for a mix of reasons.

Like the surveyors of decades past, many of them enjoy the ability to work outdoors and see the impact of their work take shape before their eyes.

Others are drawn to the ability to continually learn new technology and contribute to new infrastructure.

On the Geoholics podcast, three young geomatics professionals joined us to share how their career started, and where it's going.



## ***Entering the profession***

We'll begin by introducing the three surveyors we interviewed and how they entered the geomatics profession.

There's no doubt that surveyors stumble on the profession in many different ways. Often the path to becoming a surveyor is a windy road, complete with unexpected twists and turns.

### ***About Gabby:***

Gabby's journey began with an interest in 3D technology, specifically when it came to the gaming industry. Then she came across a company called Cesium, a platform for software applications designed to enable the power of 3D data.

That discovery led her to get involved first as a developer, and then in the areas of open source, GIS, and 3D communities.

Currently, she's busy leading a team to apply 3D technology in partnership with Komatsu, a Japanese construction equipment company.

Gabby's team partnered with Komatsu to create an app that brings data—such as from drone flights and smart construction machines—into one portal in order to enable 3D measurements.

If you've ever heard the term "digital twin," that's Gabby's current work in a nutshell. Today's companies are interested in collecting data and making models.

"What you can do is create this three-dimensional digital twin model of your construction site, or your buildings if you're in real estate, or your city if you're in city planning, and using these to make real-time decisions about your projects," Gabby said.

### ***About Chris:***

Next up is Chris, who has worked at ODOT since 2016. His work has taken him all over the west coast, completing projects on behalf of the Department of Transportation.

He enjoys working in the public sector because there is a commitment to doing things the right way. Working for the public good



means that his team has both the opportunity and the resources to see projects through and partner with other talented organizations. More than anything, Chris enjoys doing work that benefits both the surveying profession and public citizens. Currently, he coordinates the UAS program which is focused on harnessing data in large geospatial data sets.

“Everything has a coordinator, right? Everything happens someplace,” he said. “We’re the folks that coordinate that. So, let’s find a way to leverage that type of information and data that we already have, and we’re already collecting. Get it in people’s hands, in the public’s hands and everybody that needs it.”

His mission is to make public data useful and equitable, just like data in the private sector is carefully collected once and then mined over and over.

#### *About Jose:*

Jose’s career started in civil engineering in 2008, when a national guard recruiter enticed him with a scholarship. He was placed in the closest job that the guard had to civil engineering at the time, which happened to be land surveying.

He was still pursuing an engineering career when a 2014 national guard mission took him to Chile. There, he assisted with a surveying project to connect the north and south ends of the country to create a more direct travel route.

“We were helping them do some of that construction work and I was just like holy hell, why haven’t I been doing this survey work for the last eight years?” he said.

When he got home, Jose quit his engineering job, went out into the field as a surveyor, and never looked back.

#### *The different layers of mentorship*

Finding the surveying profession is one thing. But in order to truly succeed and get established, it helps to find a good mentor.



Some mentors will help you learn the technical side of things, as you work side-by-side almost in an apprentice or shadowing capacity.

They teach you how to press the right buttons, deliver maps, and operate machinery.

But Chris says that the best mentors go beyond that, taking on the role of a coach and guide, through both life’s professional and personal challenges.

“Work is not just all DTMS and drones and LIDAR. It’s ‘I broke up with my partner, my parents are passing away. What do I do? I’m afraid to take the test.’ All of these other things that we seem to struggle with,” Chris said.

Chris has now reached the point where he can act like a mentor himself. He’s focused on imparting the wisdom that he wishes he’s gotten when he was just starting out.

#### *Mentorship takes education to the next level*

Gabby’s opinion is that mentoring has been crucial to her success. While education can provide a good foundation of knowledge, school can only teach you so much.

“When the rubber meets the road, mentors are really what leads you to opportunities and what helps you overcome certain problems as they come up, and really give you the set of tools that you’re going to be using every day,” she said.

“Formal education gives you a lot of the tools you need, but not necessarily how you should use them. And I think a lot of what mentorship ends up teaching you, is how to solve problems when they actually come up.”

**EVERY NEXT LEVEL OF YOUR LIFE  
WILL DEMAND A DIFFERENT YOU.**

She's had multiple individuals that she considers mentors, including the CEO of Cesium and senior developers that she works with.

Jose agreed that you need someone to take you beyond the theoretical knowledge of books and into the real world.

"You can learn as much as you want from a textbook, but you're not going to get the same experience. You're not going to get the same knowledge, or the feedback, or constructive criticism, whatever you need. That red line 'WTF' on one of your plats, you're not going to get that from a textbook," he said.

All three professionals agreed that education was truly important, and that education and mentoring are most powerful together, with one helping build upon the other.

It's also undeniable that the best mentees have the mindset of a student, with a humble outlook and a hungry willingness to learn.

### ***Mentorship is a two-way street***

It's also important to remember that both young and experienced surveyors can learn from one another. Anyone can mentor anyone, regardless of age or background.

"Everybody should have a mentor, even those I'll use old 'grouchy guys,'" said Chris. "I think if we don't have mentors that are younger than us, that they're failing themselves."

There are three or four separate generations hard at work in the surveying world today. The way that a young "digital native" sees something will be unique from how a more senior, traditionally trained surveyor sees something.

"Those are two very different ways of growing up, and they both can educate each other and help each other along," said Chris.

For Jose, mentors are the ones that helped give him the push he needed to reach new levels in his career. Now, it's all about helping to pay it forward.



### ***Understand what's behind the tech and embrace technology***

Entering surveying today looks different than it did a decade ago. New technology is being developed and honed each day.



It's important for new surveyors to be willing to tackle the challenge of technology. Luckily, it seems that tech is also surveying and geomatics' new biggest draw.

"It's going to appeal to the younger generation, just because it's a shiny toy and people are going to want to learn how to use it and do something outside of the ordinary with it," said Jose.

That said, you can't just be pressing buttons; you also have to be committed to understanding what's going on beneath the surface.

There's an increasing demand for fast and efficient data collection.

But no matter how easy it gets, there's always going to be questions, things that go wrong, or formatting issues.

"I think there still is an incredible need for people to understand what's going on behind the scenes of all that technology," said Gabby.

No one knows what's coming next in terms of new tech like AR and VR that could be used for 3D visualization. It's exciting but will take work to master.

"It's an exciting future, but we're definitely going to need people that understand the cogs and gears of how it goes on," Gabby said.

Chris said that the danger of technology is that it makes things "too easy." When the emphasis is on ease and speed, it can quickly devolve to just beating the company next to you in order to make a profit.

"I think that's just unfortunate, because I think there is plenty of work to go around in a lot of ways," he said.



The danger is when we stop thinking, because that also makes the work less interesting.

"I'm simply like one of those grouchy old guys now," Chris joked. "It's good to think your way through it a little bit."

### ***Get involved***

Once Gabby, Chris, and Jose got established in their careers, they all started looking for ways to get involved and spread the surveying love to others.



The goal? To raise awareness about the profession, welcome new faces to the profession, and help them progress in their careers.

Chris, Jose, and Gabby have gotten involved with the NSPS, which is a great organization for young surveyors.

"I met some of my favorite people in the world through that group. And so, I think one of the greatest benefits is one gaining access to your state organizations is important because they're going to be the folks that are going to be supporting you through these meetings and the meetups with the national group," said Chris.

Involvement in the NSPS allows for exposure to what's happening in surveying in other states, at a national scale.

It's great for job opportunities, too.

"At this point, I could call up, a half a dozen to 12 folks in any one state and potentially get a job," said Chris. "Or maybe they're traveling, with a problem. They can call me and vice versa. And so, it's just building that social network."

Jose recently got involved with the NSPS diversity committee that kicked off not too long ago.

"There's definitely a lot of opportunities for young surveyors to kind of champion that, and I think expand the areas that we've been focusing our resources on. Because not only are we not doing enough recruiting as it is, but we're also narrowing and focusing our efforts in the same areas every year. So, expanding that," Jose said.

As part of the Texas Young Surveyors group, an offshoot of NSPS, he's also helped put together a booth at the Houston Hispanic Forum's 34th annual education and career fair. Close to 5,000 students came by the booth, intrigued by the 3D sandbox display.

"It's a really good way to build those bonds and do something that you're not going to be able to do by yourself because you don't have those resources," Jose said.

Almost every state has an NSPS professional organization, with a representative that you can contact. If not, you may be able to create a young professional's group in your state.

It's an excellent way to take part in and contribute to something bigger: the surveying profession as a whole.

### ***Meet young people where they are***

When you're trying to connect with young individuals like high school and college students, it may take a different approach than in years past.

"The younger generation, maybe they don't want to cut brush with a machete or start at the bottom or whatnot," said Chris. "We just need to be more flexible. We don't need to have these really strict 'this is how I've always done it. This is how you're going to make it through to be a surveyor.' I don't think that those serve us any longer."

This will require about how the surveying profession fits into the modern world.

Chris gets hands-on by teaching an entry-level survey course at a local community college. He also helped start the Young Surveyors Network in Oregon, and partners with the technical education campus in Salem, Oregon, which teaches some surveying material.





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“There’s this really cool program where if you have some sort of engineering degree or surveying degree, we rotate you through the businesses that you might be working with as a surveyor at ODOT for two years, and then you get a full-time job at the end,” he said.

These are the types of innovative internships that surveying needs.

“Surveying was built by folks that weren’t afraid to get dirty. And it seems like the work that needs to be done is just getting out to the schools and the high schools,” Chris said.

For those who aren’t afraid of hard work out in the field, a little hard work getting involved off the field is just another rewarding professional challenge.



# Project Management 101

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*An abstract of The Geoholics Podcast – Episode #66.5*

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## ***Are you a project manager?***

Even if your title doesn't include those words, chances are you're responsible for some elements of project management.

Like anything, project management is a skill set that can be practiced and honed. It involves things like visualizing the steps ahead, getting buy-in from key stakeholders, and managing team members and vendors.

Glen Abramowski, Supplier Program Manager at Boeing, has spent the last three decades in the realm of project management. Tony Mintrup is an IT and project management professional at Klein Tools.

As guests on surveyor Kent Groh's Geoholics podcast, the two men broke down how they conceptualized project management from start to finish.

Read on to hear their four-step thought process, and gain tips to help you whether you are running a survey firm or are considering a proper project manager role.



## ***Step 1: Project initiation***

The first phase of kicking off a new project is the initiation phase. For Tony, this is what he calls the project charter.

“Number one for me is project charter. You’ve got to define what the scope of the project is. Who the stakeholders are, a rough timeline, what your objectives are with the project. If you start with that, you can run any project,” he said.

Yes, there are certainly more steps that follow to enable pulling off the project itself. But if you are able to encapsulate the key details summarized below, you’ll kick off the project in great shape.

1. Project goals
2. Project stakeholders
3. Project timeline
4. Project risks

There are lots of fancy project management organizational tools out there. But Tony’s tried-and-true system is to get the above four details summarized in a 1-2 page Word document.

Use that document to get buy-in from all key stakeholders, getting their literal sign-off if necessary.

Tony also takes time in this first phase to think through any risks associated with the project.

Risks can include things like:

- Critical vendors
- Critical funding
- Critical resources

You need to think through what happens if you can’t get the specific vendor or funding that you need. What will be the Plan B course of action?

Sometimes the project manager isn't the one spearheading the very start of the project. If that's the case, try to make sure you're at least in the proverbial room and looped into these key conversations. Otherwise, it will impact your ability to do your job well.

"Ideally, the project manager's involved from the start. They're the one that's doing the initiation," Tony said. "But if that's not the case and it's handed to you, I do the same thing. I say, whoa, we don't even have a charter yet. Let me see what you got here. Let me build the charter, and let's go from there and think through all these things because if we don't, that's the number one risk."

Kicking off a new project without proper initiation in the form of a charter means that you run the risk of unclear objectives and wasted money.

In his work for Boeing, Glen takes a similar approach and adds one additional factor to the mix: thinking about project competitors.

"I always have to think about competitors in addition. So that might drive how we tweak the scope. Now, obviously, you may have a directive scope from the prime contractor for our customer. But you may want to try and slip some things in there to try and throw your competitors off or give yourself an advantage," he said.

This ties into thinking about your company's long-range strategies and how an individual project fits into the bigger picture than just the value of the project itself.

## ***Step 2: Project planning***

Surveyor Kent Groh jokes that he lives by the "Seven P's" tongue twister when it comes to project planning: *Proper prior planning prevents piss poor production.*



But all laughs aside, the planning stage is critical.

Even if you're a surveyor focused on \$1,500 lot surveys, setting up smart processes can still lead to increased profitability.

### ***Map out major milestones***

Planning your project takes the outline of your project charter a step further. It involves mapping out critical details like major milestones.

"I like to say, all right, here's the major 5-10 milestones, or deliverables. And roughly, this would take six months, four years, whatever. So that's what I would put in the charter, just so the stakeholders have an idea and we can come to some agreement," Tony said.

If you apply this to the world of surveyors conducting lot surveys, maybe this translates to an email template that you use as the base for every single project. Then, each time you get a new proposal, you change the name and send out the email in a quick 15-20 minutes.

For Glen, the planning stage is all about simulating the project in his head. Just like competitive athletes visualize themselves doing a race, you can do the same thing as a project manager.

"When you're in the planning phase, in your mind, simulate the first couple of days, simulate the month, simulate the year. You've done these things a hundred times, so simulate it in your head," he said.

Use this process to tease out those milestones, then write them down on paper. This will help you start sequencing the project in a logical order.

"If you're in some of these smaller projects, just list the four or five things you want to do today as part of your plan. Then simulate it in your head, and then you'll start to be able to sequence the things that lead you to that milestone and what kind of resources you need along the way," Glen said.

Once you have your milestones written out, treat that list as a map.

What tasks need to be completed to take you from Point A to Point B? Then, from B to C?

"Just pretend you're going to do the job yourself. Then along the way, okay: that means I need that GPS. I better go get that," Glen says. The process is like putting together a physical toolkit to head to a job site, but at this point, it's all in your head.



The “tools” you need can include things like:

- Physical tools
- Paper resources
- People
- Equipment

Think about everything possible.

“If you’re going to go to someone else’s site, what are the ingress/egress? Where are the safety points? How do you keep yourself safe while you’re doing the job? All those things are part of the resources,” Glen said.

### ***Consider quality control***

Creating a thorough schedule based on project milestones is key to quality control.



A big project is like a line of dominos: if you tip over one domino, the rest will start to fall.

“It’s gotta be built into the schedule. It’s not; here’s my project schedule of tasks, and then quality control’s off somewhere else,” Tony said.

“Even if it’s one task, you gotta account for it. What I’ve learned in projects is come up with a great plan. Stuff happens. And whoever’s at the last third of the project that has to deliver, they’re already screwed. Because the delays just impact them. And that’s usually quality control comes at the end.”

Whether it’s securing the critical resources, you identified earlier, buying materials, or scheduling personnel, you need to help set up the rest of your team for success in their own roles.

“You’ve got to know your vendors, and you’ve got to qualify them in advance. I think that’s part of quality control and risk assessment as well,” Tony said.

“When I think about risks, people sometimes confuse risks and issues. Risk is like a ‘what if’ scenario. What if this happens? What are we going to do? And then are we going to try and eliminate the risk or avoid it? Are we just going to mitigate it, so it doesn’t have as much of an impact?”

Ensuring quality control might look like a detailed onboarding process for vendors, so everyone’s in the loop and working towards the same goals and expectations.

Glen said that there need to be clear signals planned out in his mind that signify you are leaving one milestone and heading into another.

“What are the things that I need to demonstrate verification to the overall requirements of that project at that phase of the program? That’s where your quality comes in. Because they’re going to be part of those artifacts and making sure that you prepare those artifacts in advance of the milestone, and then you document them after,” he said.

All of this activity is in service of demonstrating completion and showing compliance with the project charter and expected delivery requirements.

### ***Step 3: Project execution***

If you plan your project well, the execution itself should be smooth sailing.

For Glen, execution is a matter of breaking tasks into chunks and ensuring the schedule is moving according to plan.



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### ***Block your tasks***

“There are lots of complicated artifacts that you can use: integrated master schedules, integrated master plans, earned value management, all kinds of really complicated things for big projects that once you’re in will give you an indication of whether you’re on track,” Glen said.

“I really do try to keep this thing to simple blocking and tackling,” he said. “From week to week, you can just keep certain things like an action tracker.”

By action tracker, he means keeping tabs on:

- Who is responsible for action X?
- What does action X involve?
- When is action X due?
- Who does action X impact?
- What happens if action X is not completed?

The real key here is knowing what needs to get done and when.

If you are working with outside vendors, keep them accountable by having them provide a schedule to you based on your desired due date.

“If I’m working with a particular supplier, I want that I want them to develop a schedule, and then tell me where they feel like they’ve fallen off their plan, and show me using their schedule,” Glen said.

### ***Communicate with your team***

As a project manager, you typically aren’t doing the hands-on work yourself. You’re relying on a team of internal and external people to get the job done.

Keeping an open line of communication and developing a high degree of emotional intelligence is important.

“At the end of every meeting, I like to ask what kind of help is needed,” Glen said. “I go around the room and say, no, literally I need you to tell me, do you need any help? What is it? And if you have something, bring it up,” he said.

This practice develops a culture where open and honest communication is at the forefront.

The more your team feels comfortable sharing challenges and asking for resources, the quicker you can identify new risks and help solve them.

Tony agreed. “You’ve got to have a great team, and you’ve got to create that. People don’t just always fall into excellence. Every day, you’ve got to manifest that. And that’s why there are project managers that can do that, and there are project managers that can’t, and they just manage the schedule.”

If you can manage a schedule, you’ll be a good project manager. If you can manage people effectively, you’ll be a great project manager.

“You have to care about the project. Number one, you care about the customer,” Glen said. “And then literally care about the people that are working within the construct of this project. And it’s not always easy to do because there’s lots of stuff that comes up. You realize that people are people. They’re human.”

### ***Communicate with your client***

As the project progresses, it’s also important to communicate regularly with your client.

“Depending on the project, you could have a standard check-in with the client and/or stakeholders,” said Tony.

For large projects, Tony’s meeting schedule looks something like this:

- Daily scrum meeting
- Weekly team meeting
- Weekly client meeting
- Monthly executive meeting





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Checking in on past projects can continue months later. After all, the true lessons learned may only be discovered once the completed project or site is used.

Any additional learnings that arise can go into your project recap and help you do better on the next project. They can even help you look better in the eyes of your client if you move to address them.

“They may say, ah, we’re really frustrated with X, Y, and Z. And you go, oh, that would have been an easy fix. And maybe you do it for free because it’s so easy. And then you’re like, holy cow. You’ve established a relationship that’s going to set you apart from your peers,” Glen said.

While there are project management certification programs out there, they are helpful but not essential. The true skills of project management are learned on the job.

When done well, project management is a role that can truly add value.



# Practical Management of Field Surveys

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*Reprinted with permission of the Nevada Land Surveyors Association, Nevada Traverse, Issue 48.2. [www.NvLandSurveyors.org/nevada\\_traverse.html](http://www.NvLandSurveyors.org/nevada_traverse.html)*

*An abstract of a Mentoring Monday's presentation from November 16, 2020*

Managing field surveys is challenging. And the bigger the organization, the more chaotic it can get. With multiple crews, dozens of jobs, and varying equipment needs, it can be a lot to keep track of.

Landon Blake is the President and Senior Land Surveyor at Redefined Horizons. He lives and works in the California Central Valley and is a certified federal surveyor and UAV pilot.

He also has experience organizing field survey crews. In fact, at a previous position, he created a role that was solely meant to streamline the field survey process: the role of a Field Coordinator.

While not every organization requires a Field Coordinator, Landon explained on a recent Mentoring Monday's virtual meeting why it is critical to consider at large organizations.

"It's really hard to run a good surveying business," Landon said. "When I say business, I mean organizations. It could be a public sector organization. It's just really hard to run an effective well-oiled machine as a land surveyor."

When issues arise in the field survey process, it can usually be traced back to a communication breakdown between the field crew and the office team.

After watching the same problems arise again and again, Landon became dedicated to trying to fix those recurring issues.

## ***How organization size impacts field surveys***

It might be easy to assume that a field survey is just a field survey, no matter the company. But the truth is, field surveys are exponentially harder to organize at larger organizations.



I tell people it's 50x as hard to run a 20-person firm as it is a ten-person firm," Landon said. "You double the number of people that the management headache doesn't double – it triples or quadruples."

Landon founded his own small surveying firm in 2020, but before that, he worked at much larger operations.

At Redefined Horizons, things are relatively simple. Landon is able to get his boots on the ground on every single job. This means that he no longer needs to prepare field packages. As the senior land surveyor and owner, he is personally integrated with all of the fieldwork.

"It becomes really important when that licensed land surveyor gets one or two or three layers removed from the actual fieldwork," Landon said. "As a licensed surveyor and responsible charge, you better have a system in place to manage your fieldwork. And you should probably really have some written guidelines that your crews follow."



### ***Why written guidelines are important***

By written guidelines, Landon does not mean a general checklist. He suggests a specific written handoff on every single field survey assignment.

Why is this important? First off, it will help to improve the quality of your work and streamline your day-to-day workflow.

Secondly, it will give you written proof if you are ever called to the board or by an attorney to prove that your responsibility on a project was fulfilled.

Landon recalls a conference presentation he attended some years ago. The presenter was both a land surveyor and an attorney.

“He said the worst part at his job was having to defend land surveyors in a lawsuit that were poorly dressed and poorly documented,” Landon said. “You don’t want to be that guy.”

Avoiding that scenario means documentation on every survey. It means being able to go back and show the written handoff, crew instructions, and checklist.

“If you can’t be the LS on the ground, I think you better have some systems in place,” Landon said. “As organizations grow in size, the need for this kind of structure gets more and more important.”

### ***Inspiration for the Field Coordinator role***

When Landon first started working at Rodale Engineering, his first 90 days were spent in observation mode. And what he saw was not pretty. The company was doing \$3-5 million a year with surveying work. And there were zero organizational systems in place.

When his boss made him survey manager, the very first thing Landon did was determine that a central person, or Field Coordinator, would be in charge of managing surveys. In the beginning, that person was Landon himself.

“I don’t think I invented the role. I don’t want to take credit for that,” Landon said. “But it’s something that I had never seen before.”

How it worked was simple in theory: If project managers needed a survey crew, they had to go through Landon to schedule it. Whether they were civil engineers or surveyors, they were responsible for telling Landon what they needed and when.

### ***How to select a Field Coordinator***

The ideal candidate for the Field Coordinator role is somebody who the field crews can respect. Somebody who has paid their dues and understands how things work out on the job site.

They also need to be comfortable behind a computer, even if that means they are typing with two index fingers.

“In a lot of organizations, you get somebody that has got a bachelor’s degree and you kind of put them in charge of the field crews and they haven’t earned their stripes,” said Landon. “I’ve seen that fail more than one time.”

### ***Field Coordinator is a full-time job***

When Landon started his new program, the results were clear. Things were smoothing out and working great.

But Landon quickly burnt out working 75+ hours per week, as both survey manager and makeshift Field Coordinator. Eventually, he brought in someone new dedicated to running the coordinator duties.

“I was just dying. Because I was trying to run projects, do business development, and run these crews,” Landon said. “That’s the bottom line. If you don’t have a full-time person dedicated to running those crews, your organization is probably a disaster.”

The amount of management that goes into properly running eight people, or four crews, is significant.

Your Field Coordinator does not have to be a land surveyor. But they should be given the benefit of a full-time position in order to do the job right.

### ***Field Coordinators have to be consistent***

The secret to success when you have a Field Coordinator is to require everyone to follow the same rules – no exceptions.

Yes, there will be some major growing pains as team members adapt. There can very well be pushback. But if you don’t enforce the process, the process will break down.

“For the first 60 days, guys would call my Field Coordinator and say, Hey, I need a crew in two days to do X and they wouldn’t have the requests,” Landon said. “I had to teach my LS you don’t get on the schedule without the written request, period.”

The first couple of times, this resulted in crews being late with client work because they hadn’t gotten things scheduled. Eventually, everyone was trained to follow the new protocols.





Some were fast learners, and some were more stubborn. “There’s always one or two guys and they’re just like, you know, they bring you a burrito wrapper with some permanent marker on it, you know?” Landon said. “They were just, it was a constant problem, and we had to keep kicking that stuff back.”

Even after Landon replaced himself with Brent, a new dedicated coordinator, he made sure to follow his own rules. If he wanted a field survey, he didn’t get to just call his favorite group. He scheduled through the coordinator like everybody else.

### ***Part #1 of the Field Coordinator role: tracking future requests***

Fifty percent of the Field Coordinator’s job is what has been alluded to above – scheduling requests for future field survey work.

At Landon’s old firm, this consisted of a one-page form. On the form was all the information that the field crew was going to need: the starting point, the number ranges, the existing control, a sketch of the mapping limits, and contact per site access.

“There’s all this stuff that the crew needs to do their job,” Landon said. “And so the LS, when he would go to get his work on the schedule, you would have to go to Brent.”

With multiple civil engineers and licensed surveyors going to the coordinator to request field work, it’s important to have a good system in place to take those requests.

Landon also noted that if you hire a non-licensed surveyor for the coordinator role, you really need to have their back during the growing pain stage of the process.

“Everybody in that organization has to know that you as a survey manager have his back,” said Landon. “Those licensed surveyors got to know that when your field coordinator says, ‘Hey, I don’t have a survey request. You’re not getting on a schedule,’ that they’re not going to get around that requirement.”

### ***Part #2 of the Field Coordinator role: quality control***

In addition to scheduling future work, the Field Coordinator is also responsible for coordinating questions between the LS and the crew and conducting a thorough QA/QC upon completion.

Questions would often arise in between survey scheduling and survey completion. For instance, crew members would need to clarify things like which street had dips, if there was survey grade stakeout for the boundary, etc.

The coordinator can ensure that the LS requesting the survey is aware of the crew’s questions, and get them answered.



### ***Managing QA/QC***

Once a crew returns from the field, the second half of the coordinator job really comes into play. Landon’s coordinator used a big checklist of things the crew was supposed to bring back to the office, such as field notes, data, and collector files.

The coordinator would check the data into Trimble business center and see if crews had used coding and run their linework.

“You can’t believe how freaking hard it was for me to get crews to rely on, you know, did they use lime or did they cover the mapping,” Landon said. “So he did a thorough QA/QC.” This process could easily take 1-2 hours depending on the project.

If something was amiss, the coordinator would notify the licensed surveyor. They would get the crew scheduled to go back to the job site and make any corrections.

Landon found this part of the Field Coordinator role to be critical. Because if a coordinator wasn’t doing this process, it often wouldn’t get done at all.

“My average LS project manager in that organization was too busy to take the time to do that QA/QC. They were supposed to be doing it, but the reality is they weren’t doing it because when they got busy. The very first thing that got pushed was that QA/QC.” This point drives home Landon’s earlier point that a Field Coordinator role is a full-time job.

### ***Other duties you can assign a Field Coordinator***

In addition to scheduling surveys and conducting QA/QC, you can leverage your Field Coordinator to help with other important tasks.

In Landon’s case, his coordinator was also:

- Tracking all equipment maintenance
- Tracking firmware on all the data collectors and toll stations
- Figuring out when batteries needed to be replaced
- Managing maintenance on all survey vehicles
- Taking care of the registration and insurance on the survey boat

Delegating these additional tasks did more than help justify the existence and salary of the coordinator role.

First, they also cleared Landon's own plate so he could focus on high-value tasks as the survey department manager. Secondly, the company soon saw a huge improvement in the quality of their work product.

"We eliminated a bunch of the problems that we were having between field and office," Landon said. "It was great because he made sure that the project surveyors were given a good handoff. And he made sure that the field crews were coming back with a good product."

### ***A good system lets you hold people accountable***

Finally, having a secure system in place means that you can begin to hold employees accountable.



"I frequently tell people when I talk about this project, sure, you give your field crew a napkin sketch for handoff, you deserve the pile of horse manure they bring back. That's the deal, right? It's a two-way street," said Landon.

You'd be surprised how much money is lost due to employee mistakes. And when those mistakes are allowed to pile up without consequence, it means the dollars continue to disappear.

Landon recalled instances of sending a crew 1.5 hours away to the Bay Area, only to have them return without getting the manholes done.

Sending that crew back again is pricey. In fact, field crew time is the most expensive time in a survey organization, if you break it down by hourly rate. To make things even more challenging, sometimes crews were already booked for subsequent days, making a quick return to the site impossible.

With a written field package, you can trace the mistakes back to their sources and dole out reprimands and consequences.

"They used to call me the checklist Nazi. I'm not saying you gotta bury people in paperwork. That's not what I'm telling you to do," Landon said. "If you can't hold people accountable, you can't fix the problems, right. That's the bottom line."

### ***Preparing a field package***

Landon also described the value of preparing a field package prior to each job.

At a minimum, Landon would complete a road safety review for any job taking place on the roadway. This consisted of a one-page form listing the speed limit, presence of a median, shoulder condition, typical traffic, a photo of the control point, and any special instructions.

Most of the time, surveyors don't think about logistics like that. They just have an address for the survey site and they drive over.

"I always had a little exhibit for every survey, an 11x17" exhibit with an aerial background with some standard notes," Landon said.

He also is a fan of sending the crew out with some kind of TBC file or data collector file, ready to go. These days, his team usually uploads the KML files right into the job file. Modern technology like cell phones and tablets makes this easier than ever.

If you are interested in learning more about Mentoring Mondays or volunteering as a featured speaker, please contact Trent J. Keenan.



# Field Note Fundamentals: How to Prepare Them & What to Include

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*Reprinted with permission of the Nevada Land Surveyors Association, Nevada Traverse, Issue 48.2. [www.NvLandSurveyors.org/nevada\\_traverse.html](http://www.NvLandSurveyors.org/nevada_traverse.html)*

*An abstract of The Geoholics Podcast Episode #72 from March 7, 2021*

Field notes: love them or hate them? Paper or electronic? Clear-cut process or wild west?

Professional land surveyors recognize that field notes are a critical part of the surveying process.

In a nutshell, field notes serve to record all pertinent information, measurements, calculations, sketches, and observations made by the surveyor during the course of their duty. These notes become the permanent record of the survey.

The bigger the project or business, the more critical field notes arguably become. And because the individual preparing the field notes may not be the same person who reviews them in the future, their legibility and meaning must be clear.



## *Three professionals share their field note expertise*

On a recent episode of The Geoholics podcast, hosts Kent Groh and Ryan Kelly interviewed three experienced surveyors on exactly how they take field notes and what they include.

The three surveyors in attendance were:

**Philip Adams, PLS:** President and CEO of Adams Surveying Company in Dallas, Texas, Adams specializes in large construction projects. Adams founded his firm 12 years ago and has been in the surveying business for 40 years.

**Ryan Swingley, PLS:** Geospatial Manager for ESP Associates, Swingley is based in Indianapolis and specializes in LIDAR and UAV. He has been surveying for 24 years.

**Phil Fedor, RLS:** A surveyor for Bowman Consulting, Fedor is a project manager based in Tempe, Arizona. A long-time field veteran, he will celebrate 30 years of surveying in July 2021.

## *Why are field notes important?*

Imagine you work for a big surveying company with ten crews. Your company takes on a big construction staking project, and five separate crews have a role on the site.

In this scenario, the importance of being able to follow the surveyor who came before you takes on both a short-term and a long-term significance.

“Following in the footsteps of the surveyor before you - that’s what we all been doing. And it’s one of the fundamentals. And on the construction side of it is a microcosm of that,” said Phil Fedor.

Essentials like where control is and how it was established, and what the line of







sight was are critical paper trail. If the surveyor or party chief responsible for the original field notes moves out of town, the new chief needs to pick up the project quickly.

“The new guy coming in has to be able to move in smoothly and seamlessly and take care of his contractor who’s jumping up and down and barking at them because things aren’t getting laid out, so they can get this stuff built and meet their timeline. Those field notes help make that a seamless transition,” he said.

While field notes are an essential piece of the puzzle at every level, they are of particular importance to the crew chief.

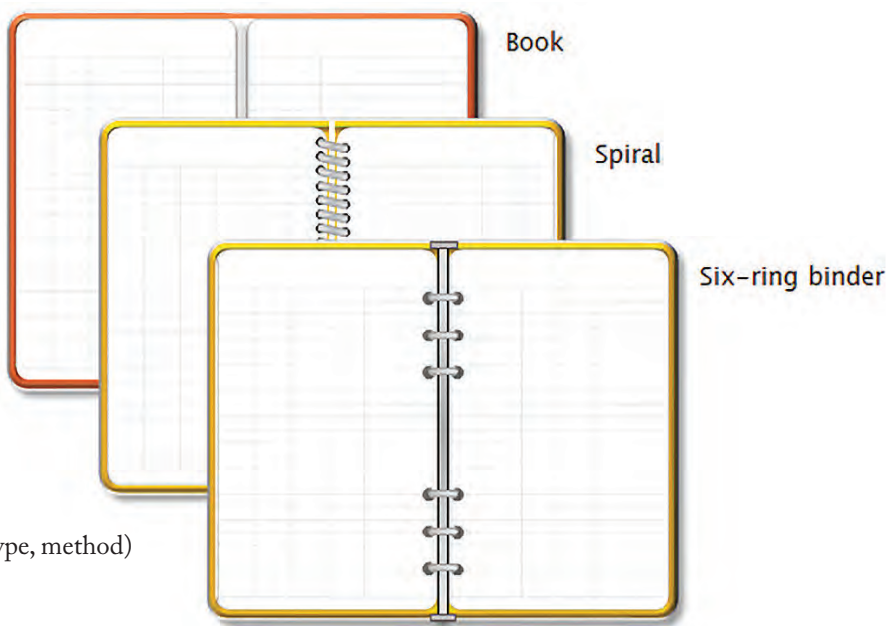
If you want to jump into an ongoing project and quickly understand where a project stands, you need access to good field notes.

“The crew chief is the eyes and ears of any office personnel. And in today’s day and age, not many of our techs and PLS’s go out to the field on a regular basis. So obviously, we’re relying on that party chief to be those eyes and ears and relay any important pertinent information to the team back to the office,” said Ryan Swingley.

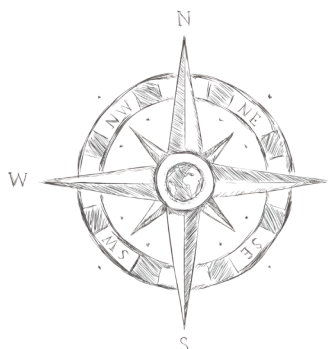
### ***Essential fieldnote components***

There are many essential elements of field notes in addition to establishing control. Important components that Adams, Swingley, and Fedor mentioned include the following:

- Date
- Team members present
- Weather conditions
- Equipment used
- File naming conventions
- Control used
- Location of first control point
- Rod heights
- Base height and location
- Level information (benchmark location, type, method)
- North arrow
- Relevant drawings
- Relevant variables impacting the site or crew



“One of my pet peeves was having a North arrow on every single page that has a sketch. I can’t tell you how many times people start drawing things and whenever someone else looks at it, North looks like the other way,” said Philip Adams.



He explained that it’s also important to give a correct sense of proportions. He recommended that teams complete a practice exercise to ensure they have a method for getting it right.

“It’s very difficult when the drawings are substantially out of proportion. You have a building five feet from a property line, but it looks a hundred and comparison to everything else. So the best way to teach these guys how to do it is to have one guy on a crew go out and draw it. And the other guy has to come into the office and draft it. And they started understanding what they need,” he said.



## Electronic versus handwritten field notes

The question of the hour seems to be: how do you actually go about recording your field notes? Is it all paper? All electronic? Something in between?

Valid arguments were made on both sides of the aisle, with the consensus being that a hybrid model works best.

### The case for electronic notes

Ryan Swingley was team electronic notes, citing the fact that you can easily save all notes to an electronic file, timestamp sensitive documents and photos, and save everything safely in the cloud.

"I don't want to say there's little place for paper notes today, but I'm definitely very pro electronic notes because electronic notes don't lie, right?" Ryan said.

With the electronic data from his GPS Rover, he knows every second every shot was taken in history, which is powerful information to have at your fingertips.

"I really liked the data integrity of electronic notes. And what I would say is when it comes to a boundary perspective and a topographic perspective to me, I mean, you can add a written note to any code or any shot. You can add attribution. You can take photos and attach them to points these days. So from that perspective, I find that there's little use of paper notes," he added.

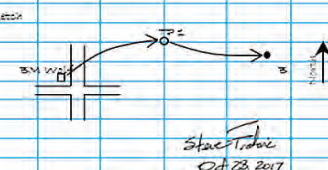
Ryan also made the point that paper notes are fragile. On one job site when he was in college, it started to rain, and the field book got kicked out of the truck and swept down the gutter, never to be seen again. And while he admits that you can lose a data collector just as easily, there are ways to safeguard and backup electronic data - but not a paper field book.



### The case for handwritten notes

Philip Adams agreed that today's technology is astounding - but sometimes, you need some good old-fashioned backup checks and balances.

Three Wire Leveling					
Point	BS (+)	Stadia	FS (-)	Stadia	Elev
BM Wolf					100.000
c	5.25		1.01		44.753
m	4.75	0.50	1.10	0.51	
b	4.28	0.49	1.00	0.50	104.753
AVG	4.753	0.39	1.103	1.01	
		39.0		101	- 1.103
TP 1					103.650
c	3.35		7.20		49.337
m	3.34	0.01	7.21	0.59	
b	3.72	0.02	6.01	0.00	111.987
AVG	3.337	1.23	7.207	1.19	
		1.23		1.19	- 7.207
B					104.780
Sum	14.090		9.350		
Page Check					
Start		100.000			
$\Sigma(BS)$	-14.090				
		114.090			
$\Sigma(FS)$		-9.350			
End			104.780		

Three Wire Leveling					
DATE: OCT 28, 2017					
WEATHER: Sunny, clear, 80°, no breeze					
OPEN	At the Demand	Barger Timing Level			
	Steve Johnson	S/N ML 10875			
	Ned Blomquist	LEV. FOR S/N 10875			
		Barger Level stadia multiplier is 100.			
BM Wolf is a 3/4" rebar, flush, at NW Intersection of Maple and Jones Streets. Elev = 995.83 ft					
Point B is described on page 7.					
Sketch					
					
Sketch					
Start Date Oct 28, 2017					

"Just to challenge that new technology, we use heavy photogrammetry and LIDAR. We're constantly checking ground observation, ground-truthing, to compare it. In a conventional survey, we still run an actual close level on every GPS point that we do. They are just safeguards," he said.

And while some people may think it's strange, his team still uses levels on every job.

"Being heavy construction, GPS just flat out by itself is not adequate for hardscape construction when you're on a network. You can do all the checks you want, but it has a floating variable of about two tenths so that you just can't mean out in construction. So we do things robotically, but we have to run a level of on every single job because you have to know what your precision is going to be to know which tool to use. And we never lose an argument when we run a level."

Philip also said that you can't lose sight of the history of the profession and need to cultivate a deep understanding of how things work and why things are done the way they are.

"When the equipment has a failure or question, you need to be able to go back to the old way," he said. "I think we'll let go of some of the use of it, but we can't let go of the history."

He gave the example of seeing an airplane flying through the sky. It's impossible not to look at the plane and know the general history of how it got into the sky in the first place.

"We'll still have to go back to the root, the core. So everything that we're doing, we have to go back to the core root of the development, whether it's the survey or the equipment that we use to get the survey," he said.



### ***The benefits of a hybrid notes system***

Just because Philip Adams takes an old-school approach does not mean he doesn't value technology. At the end of the day, he sees a clear need for both legacy systems and new technology to work hand in hand.

About seven years ago, Adams' company bought a drone to start their photogrammetry department. Soon, they were taking drone photos for every single boundary. For every image, they then create a compilation mosaic in order to underlay additional survey information such as sidewalks.

"Every photograph associated with that mosaic is stored in a database that has the date and time. So we have that type of record as well, but we still have a handwritten field book that says this drone flight occurred on this date, and this time this was the drone we use," he said. "The photo or photogrammetry has replaced a lot of hand notes because a picture's worth a thousand words."

In this way, handwritten notes and photos work together.

"There's a lot of data that is stored in the data collectors. It's processed; it's raw data. But I look at that as like paragraphs in a book. And I look at the handwritten notes as the footnotes describing when and where something occurred because you have to trace it back somehow," He explained.

Phil Fedor agreed. He explained that when it comes to boundary surveying in the construction world, he likes to see handwritten notes that cover key project elements like the state of the control and monuments.

"There certainly has to be a compromise for lack of a better term. But yeah, I mean, you certainly don't want to throw away the old way, and you know, throw the baby out with the bathwater, cut your nose off to spite your face, all those cliches. They both have to work hand in hand," Fedor said.

As with many aspects of surveying, you have to trust the insights of competent, boots-on-the-ground team members as they record important information on the fly and have appropriate technological aids in place.

### ***Field notes as legal evidence***

Perhaps the most significant consideration when it comes to field notes is that the notes aren't just a good handoff between professionals - they are also a key piece of evidence within the courtroom setting.



This is one of the biggest reasons why Philip Adams argues for a combination of handwritten and electronic field notes: in the legal world, he has observed firsthand that handwritten evidence often wins.

"I spent a lot of time in court or trying to avoid being in court because I was an expert witness," he explained.

"The field notes are the genesis of your survey. Everything is rooted in those field notes. You can have a flawless survey, but if your field notes don't support it, the court's going to reject your findings. So it's absolutely imperative to have those field notes as perfect as possible."

Naturally, the first hurdle is that you need to have field notes, period.

"If I don't have the field notes, or if the other side doesn't have field notes, whoever doesn't have good field and usually loses. You can sit there and talk all you want about your survey, but unless you can prove it, it's difficult," he said.

As far as whether electronic field notes will cut it or not, sometimes it just comes down to the judge assigned to the case and which field note format they view as being superior. But more often than not, he's seen surveyors who have some form of handwritten evidence win out.

"If you're in the field and you're taking handwritten notes, those are more valid than the collected data that's processed later. So there's an order of dignity of call, so to speak, in the chain of title of how these notes were created. So you want to get those handwritten notes, even if it's not specific to the details, but what day it was, who did it, and generally what were you trying to accomplish," he said.





If you have text messages and photographs that are meticulously dated and timed, those can certainly be on par with handwritten field notes.

In the end, it all comes down to the aura of thoroughness and trustworthiness that you can present based on your cumulative field note data. Because we live in a very litigious society, you want to make sure you CYA: cover your ass.

### ***Field notes role in the construction world***

If there's a surveying sector where field notes retain extra importance, it's in the construction realm.



Phil Fedor drove home the point that party chiefs are the critical link to transmit information from the field to the office - and more often than not, that means taking good field notes.

"You're the eyes and ears of the field for the office, and you've gotta be able to convey that story to us. And so that way we can take care of our contractors or our clients, whatever the case may be. So we rely heavily on you guys to be able to draw that picture for us, whether it be in words and numbers or actual drawings," said Phil.

Philip Adams agreed. In the world of land development, where boundary surveys are plentiful, it's hard to move totally away from handwritten notes pertaining to corners and offsets to roads.

Rather than focusing on how the field notes get taken down, Adams is currently focused on accuracy.

"I think one of the things we're trying to do and in our own way is not necessarily getting rid of notes, but trying to avoid transposition errors, human errors, just user errors. We're actually investigating inverted scanning technology so that when we pop a lid on a manhole, we can just scan the manhole instead of having the traditional way of writing it down," he said.

All too often, manhole measurements are transcribed incorrectly, or one-person crew data results in confusion since there is no partner to double-check the notes and calculations.

Ultimately when a contractor is standing in front of you telling you that you screwed up, you want to be able to correct them with confidence rather than slink off with your tail between your legs.

### ***Surveying is an art***

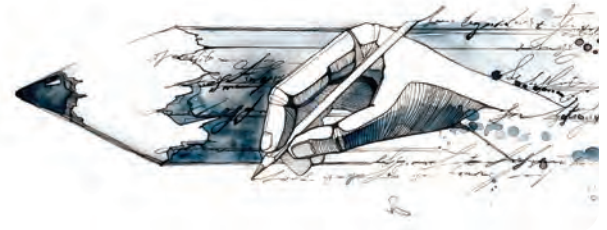
Surveying is more than flying drones and beeping machinery.

It's both an art and a science - and field notes are an integral part of that.

Field notes don't just supply evidence for a theoretical courtroom. They tell a story. Looking back at surveyors' field notes from decades past is to witness something both informative and beautiful.

Surveyors can and should take pride in every stamped survey that is sent to a client and every field book that carries that story forward into the future.

To learn more about The Geoholics Podcast, visit their website at: <https://thegeoholics.com>



# The Business of Land Surveying

Prepared by Trent J. Keenan, PLS & Kristina Poulter

*An abstract of The Geoholics Podcast – Episode #66.5*

In 2002, Daniel E. Beardslee was the founder of a surveying company that he had owned for over 25 years. He stated the following regarding the tenuous relationship between land surveyors and business development skills:

*“It has been my experience that surveyors as a group exhibit poor business practices. There are certainly exceptions, but my opinion is that poor business management has been the only reason that land surveying has not risen to the level of other professions in the eyes of the public. There is no reason, after all, why surveyors should be considered with less regard than engineers, lawyers, or dentists, except for one thing – money. Engineers, lawyers, and dentists are all regarded, in general, as being better off financially than we are and are therefore placed higher in the social stratum of society. If surveyors were perceived as being as well off, they would, over time, be held with similar esteem. We have only ourselves to blame for this fate, and good, common-sense business decisions can help us elevate ourselves.”*



Twenty years later, the land surveying profession finds itself at the epicenter of multiple forces.

1. There is a labor shortage spurred by an aging workforce and the complications of the global pandemic.
2. There is a notable pay discrepancy between surveying and professions like engineering. Per the 2020 Department of Labor's statistics, the median pay for surveyors was about \$65,000 per year compared to \$88,000 per year for civil engineers (a roughly 35% pay gap).
3. There is more work available than ever before, with a skyrocketing demand for surveying work.

Much of Beardslee's pronouncement seems to ring true through all of this. So why do many land surveyors struggle with business development, and how can business owners take steps to become better at it?

Surveyor Kent Groh conducted a recent three-part Geoholics podcast series dedicated to this issue. What follows is a synthesis of the advice that was shared by eight knowledgeable survey professionals.

## ***What is business development?***

It's not surprising that surveyors aren't experts at business development. As with many professions, there are few to zero business courses offered or required during the pursuit of the profession. Business skills must be picked up on an ad hoc basis, from trial and error or from knowledgeable mentors.

The old saying rings true: you don't know what you don't know.

Most surveying business owners are typically busy thinking about each month as it comes, simply aiming to make enough profit to keep their business running smoothly and their employees paid.

But a true benchmark for success is more than money in, money out. A long-term, thoughtful strategy can help you generate a better reputation and more money over time.



“I think long-term objectives is something that’s honestly missing a lot,” says Byrom Hess, the Chief Financial Officer at Rountree Inc.

“Too many people are just focused on hey, I need a job right now for my guys. They’re not looking at okay. Are we still going to be able to do this and be as profitable three years from now?”

Do you need a formal business development plan? Not necessarily.

Many large companies do have formal business plans, but often they don’t change at all from year to year, or the goal is simply to grow the business by a certain percentage point.

A good business is run less on a formal business plan document and more on refining your processes and behaviors over time so that you and your employees are happy. It involves cultivating a refined skillset around activities like networking, billing, hiring, branding, community involvement, and more.

### ***Relationships are the lifeblood of business***

If there’s only one lesson to take to heart, it’s to recognize that a strong business relies less on project volume and more on building relationships.

“Relationships” doesn’t simply refer to client relationships. It also encompasses relationships with fellow surveyors, tradespeople, and smaller and larger companies.

“Business development I think of mainly as retaining existing relationships, building new relationships, and also fence-mending and making sure that the people and clients that we might not feel great about, or project managers that are gone, that we always reach out. It’s all about relationships in business development and having that key capability to be able to gather intel and have it first,” says Dorina Bustamante, Director of Business Development at Ritoch-Powell and Associates.

“I’d also say that it’s vital to have healthy relationships with your colleagues and competitors. Sometimes we have to divide and conquer. Sometimes if it’s government work, you can only win so much with a certain agency. So we’re constantly discussing how we prime or sub. And the teaming dynamic is very exciting.”

In terms of clients, you want to establish your reputation as a reliable expert. In terms of other survey firms, you want to be able to partner together if the need arises. And in terms of fellow professionals, you want to maintain a working knowledge of who does what, and who you might want to someday hire.

Relationships function like compound interest. The more you put into them, the more you’ll get out of them over time.

### ***Don’t chase commodity-driven clients***



But how do you get out of the day-to-day trenches and into the point where you’re focused on those higher-level goals?

The first step is to think hard about the clients and projects that you’re pursuing.

Ideally, you don’t want to work with clients who view surveying purely as a commodity, without any value for your expertise.

“I refuse to race to the bottom. I am trying to find those clients that are going to respect what I do and pay me the most I can,” says Nolan Mark, owner of On The Mark Land Surveying LLC.

“I’m not charging \$200-300 for a lot survey. It’s just ridiculous. I don’t want to





go out there and burn my time to do something like that, or maybe a mortgage lot survey that's just two pins, tape up a house, and throw in a piece of paper and then the realtor's happy and they get a close. I'm going to tell you what I think the cost is going to be, and that's what it's going to be."

When you go from working for someone else and having a secure paycheck to running your own business, you need to think about profit. That means aiming to be the lowest bidder to win work is usually a losing strategy in the long run.

Nolan would much rather quote a price that's higher, and have clients choose to pay him that rate because they trust him to get the job done.

Michael Thompson is the President of Halma Thompson Land Surveys Ltd., where he has a staff of seven employees. He says that he occasionally will take commodity clients like land-transaction surveys, but it's not his focus. It's just to fill in the gaps.

"We will do that, but that's just something to keep the guys busy while we're not doing work that actually makes money, the better margin work that we really want to go after," he says.

"You really don't want your services to be a commodity. I'd say you're going to fall into one of four models. Either you're the cheapest, you're the fastest, you add value, or you make your client feel special. You don't want to be the cheapest, and being the fastest is a lot of stress. So I really want to be in that market where I'm going to add value to the client, or I'm going to make my client feel special.

And that's where you get the most reward, and you get the most money."

Despite appearances, there are many clients out there where price is not the primary concern. Many clients would rather have work done, and done well, than go for the lowest rate. That's exactly what Byrom Hess has experienced. Many of his clients are fixated on quick turnarounds, for example, and are willing to pay handsomely for it.

"Some of our more profitable clients, it's because they know, hey, I call you and I need that in 24 hours, you're going to stay late and jump through hoops and get it done. And that's what allows us to have higher profit margins for that client, because they know that.

But each client's a little different. So that's why you need to get to know and find out what's important to them," he says.

### ***Pursue the right projects***

In today's market, pursuing high-margin projects is easier than ever.



"People are so busy right now, they won't even answer their phones. They won't reply back," says Will Wing, owner and CEO at Infinity Land Surveying, LLC.

"So if you just take the time to reply back to them, literally that's how easy it is right now. That's it. They're just like, 'oh my God, you replied to my call. Yes. Can you meet with me?'"

The key to picking the right projects is learning to say "no" to the wrong projects.

If you fill up your plate too quickly just to keep your team busy, you could end up having to turn away work that you want.

It's easy to fall into the trap of saying yes, but saying no will help put you in the driver's seat. When you push back against bad clients and unreasonable deadlines, you set the tone for everything that follows.

Dorina has found this to be true in her work at Ritoch-Powell and Associates. "We shouldn't just go get a job because they can hire us.

We should find the fit. And that's what we do, is try to find the fit."

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So what kind of surveying jobs have the best margins?

Below are several areas that received special mention from surveying business owners:

- Publicly-funded projects
- Specialty areas like telecom and solar
- Utility projects such as powerline and gas
- Projects that are qualification-based

If you're only doing construction staking, for example, you're always going to have a low margin and will need to rely on volume. But if you focus on a variety of projects where you can charge a premium for your expertise, you can make more profit.

More profit is key if you want to invest in your business and employees.

"We can no longer commoditize this kind of work, because the biggest premium is employees," says Rich Antonio, VP of Business Development at Alta Southwest.

"If you don't invest in your employees in the future and highlight those, there is no growth in the future, because the rest of it doesn't matter."

High-margin projects mean that you can invest in employee training and technology that will help maintain your competitive edge.

### ***Analyze your billing strategy***

Once you have your ideal clients, you also need to consider how you're billing them. There are no right or wrong answers here, and they'll depend on your client relationships or the project type. But there are billing strategies that will serve you better, in certain instances, than others.

### ***Collecting money up front***

One strategy you may not have considered is to require full or partial payment for your services up front.

Want to weed out clients who aren't serious? Require some payment up front. Want to avoid hounding bad clients for months? Require payment up front. The amount of time you have to spend collecting outstanding payments are hours out of your valuable week.

In short, there's no need to be afraid about asking for a deposit for a professional service. A common model is to charge 50% up front, and the remaining 50% upon completion.

"We do for this for residential," Byrom says. "If it's someone that we work with all the time, then we don't. But if it's someone like, 'Hey, we have a little boundary survey for our property.' If we're going to take a project on like that, or even if it's like a new client that we're unfamiliar with, a lot of times we'll say like 50% up front. Because it's just the unknown."

Michel agree that he's a fan of collecting a retainer via credit card in advance.

"Especially if it's boundary staking type of work, get a retainer or get that credit card number before invest in that," he says. "You run into situations where someone says, 'oh, can you please state this boundary for me?' And then they find out, oh my neighbor's fence is two feet on my property. They should pay for that. And then all of a sudden you're in a loop. You'd never get paid for that. So you got to take that retainer head time, and you're going to weed out a lot of undesirable clients."

Again, if you have pre-existing clients that you trust, this method is probably not necessary. But there's no reason you can't charge some clients a deposit and grandfather other clients into your circle of trust.



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## *Time & materials vs. lump sum*

You have two major options when it comes to how you bill: lump sum, or based on time and materials. There are cases to be made for each type.

Time & materials:

- Makes sense when scope is unclear
- Makes sense for almost all construction projects
- Guarantees you'll get paid for the time and effort you put in

Lump-sum:

- Makes sense for boundary and topo work
- Makes sense if you have a client who wants a firm number, without any surprises
- Inspires you to become more efficient so that you can benefit from higher profit

"In general, we try to do percent complete. I look at percent complete is the more efficient we can be," says Byrom. "I like to be able to say, Hey, let's become more efficient. How do we do this? And then use that to become more profitable. because if you're doing T&M, then your billing rate is basically what your profit's built into. So you're going to have to make sure that billing rate is at a rate that's right."

Michael says that many clients, such as landowners and farmers, prefer to avoid the headache and confusion of T&M. Instead, they want a straightforward number.

"If you have a farmer that wants to subdivide a piece off a quarter section, they don't really care that you charge this much an hour and it's going to take this much. Do you have an estimate? Just tell them it takes \$5,000. This will be done. And that's where they want to hear. They don't want to hear oh, here's my hourly rate and blah, blah, blah. Just add it up. You figure it's going to be \$4,000. So you tell them \$5,000," he says.

Overcharging slightly in cases like these isn't sleazy, it's part of the process of mitigating your risk. Some clients you'll clock in under the lump sum number, but others you'll spend extra time on.

## *Find the right employees*

If you're a new business or just getting started as a sole proprietor, chances are you are thinking about when and how to grow your team.



Despite the current labor crunch, most small business owners are not comfortable hiring just anyone. Most are looking for the right fit.

"At the end of the day, it's finding somebody that's that really has the drive and the interest, and that wants to pursue it, says Will. "I've got the insurance ready, I've got the paycheck, I've got everything in the background is ready. It's just finding that diamond in the rough."

Sometimes the right fit means the right experience, other times it means finding someone you know you can rely on.

"You want to clone yourself," he says, but "they don't have to be perfect. Just somebody that can meet your criteria as the edges lead them in the right direction."

Nolan knew that he was ready to hire once he felt like he had perfected being a business of one, and then got tired of working all-nighters and every weekend.

But you still have to learn to let go and delegate in order to make it over the hurdle with a first hire or new hire.

"When you're the one doing everything and you're going to start passing that onto somebody, it's nerve-wracking. Because I'm hiring a guy with zero experience in survey, but I can trust him. I know who he is. I know his background. Trust is going to go a long the way more than hiring a guy I don't know that wants a truck, wants a phone, wants everything handed to them right away, but he might leave tomorrow," Nolan explained of the individual he's in the process of onboarding now.



While no one can see the future, you want to hire with the future in mind. Can you see an employee sticking with you over the next years to come?

“When you’re going to take on people, you have to put a lot of thought into how you’re going to retain them. Where are they in life? Do they have young families? Do they really want to be in this business?” Michael says.

Michael says that he would rather overpay a new hire than have to replace them in six months simply because of a slight paycheck gap.

Your best bet is to treat your employees as an extension of your family.

“I think that in general, survey companies treat their field staff like shit,” Michael admitted. “Most people want to have a family. They want to have a good life. They want to be able to have their weekends to do whatever they want. To meet their needs, you need to be able to allow people to do that. I don’t like to say ‘oh, if you’re in survey, you work a lot of overtime. He can make a lot of money.’”

If you’re not sure where to start looking for employees, Bill Swope, the Geospatial & Survey Business Development Manager at Half Associates, Inc., has some advice.

He recommends working with associations and community groups to present surveying opportunities to interested groups.

“I’m lucky enough with the company that I’m at that they give me a lot of autonomy with what I do. And they feel that if I go out and help with things in the community that will bring business our way to in the end,” he says.

That’s why he does lots of work with the ISD in Texas—to plant the seeds for future partnerships and hiring opportunities with Half Associates.

“They don’t understand that the careers in surveying and geospatial are even there. They don’t have job code classifications for this. So a lot of it is working with them to understand what’s actually there, and what those opportunities are for their students once they get out of high school.”



### *Stay on top of new technology*

To stay competitive and maximize profit, it’s also wise to stay abreast of the latest surveying technologies and applications.

Now more than ever, it’s more important that we listen to what our clients are saying. If we listen, we’re going to get a better understanding of their challenges, and how technology can help solve them.

“Change is just constant. And in particular, with what I do in geospatial, that change seems to be coming in at such a breakneck speed,” says Bill. “With geospatial, I’m trying to find new ways to use the technology, to expand what we do.”



Bill finds himself constantly adapting geospatial technology to fit new sectors, or to find new ways to service existing clients.

Ultrasonic drones can now map oil and gas systems, and assist with leak detection, for example. New technologies make new applications to surveying endless.

“When it comes to the geospatial realm, it’s just data collection. It’s just a more efficient means of doing data collection, and new and different ways of doing data collection. But it’s because we’ve gotten this new technology that allows us to do this. We’re able to change perceptions about what land surveying is and how it can be expanded in the future and moved into different markets. So I think it’s really exciting and it’s fun to be at the forefront of this,” Bill says.

It’s not in every industry that you can see significant advancements happening before your eyes.

## ***Build your brand***

Not all the work of running a successful business happens within the walls of your office or within the confines of your job site.

There is also branding to consider, and a large part of building a brand happens through the process of community development.

“Aren’t we all community builders in what we’re doing? And isn’t civil engineering and this early pre-development all community building? We literally link roads and sidewalks and public spaces and private spaces together. So yeah, this is community development,” says Dorina.

With Ritoch-Powell and Associates, she is able to work with nonprofits like the Urban Phoenix Project and many other advocacy organizations.

When Dorina sees membership and sponsorship opportunities, she doesn’t do them halfway.

“If we’re going to be a member of something or sponsor something, then we need to have a dynamic role. I need logo glory. I need my leadership present. I need to make sure that we get the bang for the buck. And if we’re going to become a member of something, we need to have an engaged staffer who’s attending and reporting back and creating opportunities for further engagement.”

When you get involved, you create value that goes far beyond your business. It’s a win-win all around.

There are also lots of innovative opportunities for bringing the community into what you do and onto client project sites.

“If you bought a historic building or adaptive reuse, invite the city council person and do a little ribbon cutting or a Mazal Tov or something. Because it really helps clients feel valued and also see that the team spirit, and that everyone is there for the long haul,” Dorina says.

Think of it as a chance to give back.

“I think sometimes in business development or sales, we feel like we take. We’re always asking, we’re taking. So it’s nice to be able to give back sometimes,” Bill says.

“I think it helps them to build morale within the company itself as well, because you start feeling better about yourself and then it just shows to the community at large that you’re willing to invest some of your time and effort in them as well.”

## ***Advice from small business owners***

We’ll cap off this article on the business of land surveying with a quick-fire round of solid advice from small surveying business owners. These are some of the things they found important to starting a solo practice and keeping it running smoothly.

### ***Save money before you go solo:***

The best advice given to Will? Do not start a surveying business if you don’t have enough money to survive for one year without getting a paycheck.

“If you’re going to get good jobs, these are with cities, with towns. And they don’t pay every two weeks,” Will cautioned. “They pay when the project is done, and the surveyor is usually the last one on that list to get paid. So you really need to understand that before you start out, because that’s a rude awakening.”

### ***Hire an attorney and accountant***

This is a must-do for any new business owner. Even better? Hire professionals who are somewhat close to your own age, so that they can grow with your business and service it for many years to come.

Says Nolan, “You need an attorney, you need an accountant. On top of that you need a bank. You need financial backing. There’s other things to think about besides just, ‘I can go out and survey this tomorrow because I have a license.’ Nobody’s questioning whether you’re a surveyor when you start your own business. You gotta be a businessman first, and then a surveyor second. Because otherwise you’re not gonna make it in this world.”



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### ***Pay yourself like an employee:***

You don't want to be worried about meeting your minimum expenses as you grow your own business. One way to alleviate those basic pressures is simple: pay yourself a salary. An accountant or financial advisor will likely tell you the same thing.

"I have overhead of \$54,000 a month, and it's a lot of pressure. You got to hit that minimum target in order to make money. But I don't worry about it too much, because I pay myself. That's very important if you're going to be a small business professional is pay yourself first," says Michael.

"Don't get into this idea that, 'oh, I can get tax savings if I just live off dividends and run my company this way.' No. Just treat yourself as an employee, and everything gets a lot easier. Some months you might lose money, some months you might make money. If you're losing money more often, then you have a bad business model and you just have to look at it. But once you pay yourself and you know that you have that set salary, then you can make proper business decisions without having the emotional rollercoaster of am I going to be able to pay my mortgage this month?"

### ***Follow your passions:***

The great part about surveying is that it can feel equally like work and play.

"The hardest part about being a business owner for me is separating the love. Because I absolutely love surveying. I get jobs that maybe I wouldn't do, but 'God that's a fucking awesome area, and I really want to go check that shit out.' So yeah, I'm going to do that job," says Will of a potential new job site.

"I've always wanted to get up there and work in that area and now I'm going to get paid to ride my quad up there all day long and go dig around and look for this shit that I've always wanted to check out? Like it's awesome."

Make sure that you find a good balance of projects that make money, and projects that you enjoy. Hopefully, they will be one and the same.

Be sure to join the Business of Land Surveying group on LinkedIn!





# The Business Aspects of Surveying: Understanding Money

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*An abstract of a Mentoring Mondays presentation,*

Jay Seymour is a senior land surveyor with the Orange County Department of Public Works Survey Division. He's also the 50th state president of CLSC.

With 50+ years of surveying under his belt and licenses in three states, Jay has seen his fair share of surveying business firsthand.

A repeat guest on our weekly Mentoring Mondays event, Jay, was proud to be giving his 127<sup>th</sup> presentation. The topic? How to run a financially successful surveying business.

As a wise old surveyor once told Jay, "If you can't make money doing this, you can't show the world how great a surveyor you are next year."

Here, we've distilled Jay's advice into several key sections.



## ***The public perception of land surveyors.***

Jay began his talk by noting that those outside of the surveying profession have varying reactions to land surveyors.

At best, they have no idea what you actually do. At worst, they think that you are downright unprofessional.

His years of experience have taught Jay that the following groups of people typically think of surveyors in the following ways:

- **Attorneys** – need extra education about what surveyors do. They often get confused by different results offered by multiple surveyors, see surveyor contracts as poorly written, and ultimately see surveyors as non-professional individuals with poor communication skills.
- **Title Officers** – often accuse surveyors of not understanding title and Preliminary Title Report (PTR). It's important to work closely with your Title Officers as they typically don't know what you are doing or know the difference between a paper boundary and a field survey boundary.
- **Developers** – are guilty of thinking they don't have to pay surveyors. Be wary of getting paid for project phases on time. Developers also see surveyors as poor business people who lack organization.
- **Governmental Agencies** – see the quality of submitted work as very poor and unprofessional, and believe that surveyors have poor communication skills.
- **State Board** – view surveyors as having poor documentation, poor contract execution, and a common failure to follow rules.

Above all, public perception is that surveyors are *always late*.

If you want to succeed as a professional land surveyor, your goal should be to dismantle the above stereotypes.

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The best surveyors will be those who are knowledgeable about regulations and finances, good listeners, conscious of deadlines, and have strong communication skills.

### ***5 daily questions you need to know the answers to.***

Once you understand and respect the various parties that you work with as a surveyor, you need to leverage those relationships to stay in business.

In other words, you need to make money.

This doesn't mean that you need to be obsessed with counting pennies. It means that you need to pay attention to five key areas of your business on a daily basis.

Those areas are:

1. Company "man hours" in signed contracts
2. Proposals "out" for professional services
3. Accounting report: AR aging report & cash flow
4. Today/this week/this month deliverable dates
5. The current mood of the company

For those surveyors reading this article who do not work in management, you may want to keep going.

The odds are good that you'll think about starting your own company at some point in the future.

"The average is telling me that you are going to start your company some time in the future, and/or you'll leave the field and come in and be a project surveyor, maybe a director of surveys, vice-president. You may own the company. You may also be that one or five or six-man firm," Jay said.

"And these things you need to know and understand because the day is going to come where you have to do this."

Now, we'll walk through each of these five key areas in turn.

### ***#1: Company "man hours" in signed contracts.***

Your first step to getting a pulse on your profitability is to calculate your "man hours" in signed contracts.

Jay explained that this means you need to do a little math.

He recommends dividing your total contract dollar amount in signed contracts by the average hourly rate of your company. This includes everyone down to your office secretary.

- ***Total Contract Dollar Amount / Average Hourly Rate***

The purpose of this exercise is to determine the amount of work you have. Why should you do this? Because the surveying business can be deceiving.

One month you might be slammed with work, and the next month might be dead. That's why it's important to take the average of all contracts for the year, to understand how busy you actually are.

Jay said that many business owners fall into the trap of passively letting work come to them instead of actively seeking it out.

"Passive is 'I've got plenty of work. I don't need to worry about this. It's no big deal. I may get to it. I may not.' Aggressive is once you've done your numbers, you say, 'I need work for my staff. I'm going to aggressively go after this proposal,'" said Jay.

"You have to determine this upfront because we get a lot of calls all day. Do I want to take two little single-family lot surveys, or do I want to go do this big construction staking project and keep three crews busy?"

Calculating your man-hours as described above might just be the kick in the pants you need to go out and seek more work for your team.

If you're curious what other firms are charging and where you fall on the rate spectrum in your area, just check with your local city or county. All public project rates are public information, published, and available for anyone to see.

## **#2: Proposals “out” for professional services**

When you go after jobs, it's critical to track what type of jobs you're bidding on, what your success rate is, and when you get paid.

Just because a project keeps you busy does not mean that it's earning you good money in the long run.

Jay gave an example from his region of Los Angeles County, where the unified school district is constantly adding campuses.

“I think they build eight or ten schools a year, millions of dollars worth of work,” Jay said. “But if you know the behind the scenes, LA Unified pays every six months, no matter when you turn in the invoice at. Six months for your pay. Now how many of us can go six months without pay?”

Just like you can track your average hourly rate for your entire company, you can and should track by the project as well. That way, you know exactly which clients allow you to be profitable.

When it comes to tracking the success rate of your proposals, this exercise can give your company great direction for future prospecting.

You want to be able to analyze the money you're going after so that you can sit down with management and say, “You know what? We put out \$11,000 or \$100,000 or \$1 million in proposals for this type of work, and we got it 2% or 8% or a 100%,” said Jay.

“So we need to not only just pick up the phone and write the answer and send it out in the email, you need to track it. How many hours am I doing to do what? And what is my success rate?”

## **#3: Accounting report: AR aging report & cash flow.**

The bigger your company is, the more difficult it becomes to track your accounting and cash flow.

AR reports are sometimes called Aging Reports or Accounts Receivable reports by management and accounting teams.

The biggest mistake you can make is to let AR reports stay in the accounting department. Instead, you need to bring them out into the light of day so that multiple people on your team can take a good look at them.

“I was amazed when I talked to a lot of people. I said, do you talk to your accounting department and see if this client has paid their last bill before I go get the new home? And I heard over and over again, ‘No, we don't do that. It's too busy. I have to take the call. I have to go ahead and put the proposal out’,” said Jay.

But...why spend good money going after bad money?

In other words, why spend the time putting together a proposal for a client who's either A) not going to select you - because their track record shows they never do, or B) is not going to pay you - because they have a history of missed payments in the past?

When your entire team has access to this information, it becomes easier to stop and think about these things instead of acting on autopilot.

Your company should also do things like creating a Marketing Plan and a Business Plan and regularly review and revise them based on your cash flow.

## **#4: Today/this week/this month deliverable dates**

Keeping organized will go a long way towards boosting your business.

Jay said that you should have a clear understanding of the items that you need to accomplish for any given day, week, and month.

If you have large ongoing projects, such as California's new fast rail, you can take stock every quarter or a couple of times per year. But for everyone else juggling multiple projects, this becomes more important.

Like with everything else discussed thus far, Jay is a big fan of putting knowledge and awareness in the hands of his team.

All of his field guys have access to what Jay calls the Budget Control Document (BCD). “You start off with a hundred percent of the work that needs to be done and a hundred percent of the dollars. And then you watch the two go,” Jay said.





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“And what you’re looking for is to make sure that we are on track for the amount of money spent to the amount of work we’ve done on the field.”

If the team starts to see work sliding outside the original project scope and budget, that means it’s time for a contract amendment or change order.

“Just having the guys show up, take the measurements, found the hubs, come in, and turn the data collector is not the role you want,” Jay said. “You want them to be an active member of your management team.”

Jay’s other secret to staying organized and keeping the team in the loop is an old-school whiteboard.

“Staff likes it,” Jay said. “Let’s you see right at a glance what am I holding up in, waiting on my authorization to proceed? Do I have my preliminary documents? Is my research moving forward?”

Yes, you can use Outlook for everything. But for team members whose days don’t revolve around the computer, a whiteboard serves as a great communal reminder of the work that needs to be done.

### ***#5: The current mood of the company***

Finally, it’s important to always know how your internal people are doing.

This isn’t about socializing; it’s about having an understanding of where unnecessary hiccups and frustrations are happening and solving them.

Jay has coined the strategy “management by walking.”

“For you guys that have the bigger companies and you’re using the corner office, you need to get out of the office and walk around and see what’s going on,” Jay said. “I could look over a guy’s shoulder on a CAD station and see something that he may not know about. Or I’d ask to see a download of a data collector.”

You might also discover that someone needs a new printer and is running up a flight of stairs every time they need to copy something.

You should also seriously consider investing in continuing education for your team. Skills like accounting and time management can be learned through quick courses, and dues like NSPS memberships and state conference attendances fees could be covered by the company whenever possible.

### ***Existing clients are your best source of business***

Now that we’ve covered in detail the five questions you should be able to answer at any given moment, we’ll dive a bit deeper into Jay’s advice on making money for your business.

The first piece of advice is a big one – to look for new work within your existing client set.

Instead of chasing new and unknown work sources constantly, Jay recommended identifying your best clients and keeping up ongoing communication with them.

“They already spend money with you,” Jay said. “How many of you follow up with your clients when the job’s done and say, thank you. Did you get the copies? Okay. Is there anything else that I can do? What’s your next project?”

By continually checking in with clients and asking proactively for new business, you’ll save wasted hours on proposals or experimenting with new clients who don’t pay their bills.

### ***Invest in marketing and business development***

When you’re busy with work, it can be easy to assume that there’s no need for marketing in your business model.

But the reality is that you should always be looking for new business opportunities.

“I had one guy tell me, Jay, I don’t have business cards. I don’t have brochures. I don’t have signs on my truck, and I’m busy as hell. And then that real bad economy hit in 2008,” Jay said.



Simple marketing tips to get started include the following:

- Schedule periodic calls to your clients and stay in touch
- Pay for a banner ad at a local sports field
- Commission gifts like calendars, pens, or paperweights
- Order business cards for every single employee

“It’s the small things, small, small things,” Jay said. “I’m not saying you’re trying to bribe somebody. I’m simply saying put your name out there.”

Ensuring that your name is visible in the community and that your team can help spread the word will help solidify the longevity of your business even when times get tough.

### ***Know the elements of a contract.***

When you win a piece of business, the contract isn’t just a formality.

It’s a legal document that requires certain things of you, depending on your state. When you execute contracts properly, they can also save you in court.

Ensure that you are familiar with your state’s requirements and that you have a contract in place prior to commencement of work that includes the following:

- Description of services
- Method of compensation/payment
- Client name and contact information
- Description of the procedure that the licensed land surveyor or registered civil engineer and the client will use to accommodate additional services.
- Description of the procedure to be used by any party to terminate the contract.



“You used to think we just got sued for putting the monument in the wrong place,” said Jay. “Now you get sued if you don’t do the contract right.”

He recommends having a copy of the current state laws available on your desk.

Finally, obtain the client’s initials and signature on any pages of the contract that include time and money deliverables.

“Courts have held over and over again; just the initials are not good enough. It’s not good enough to sign just sheet one or sheet 10 of a 10-page contract,” Jay said. “Money and time written in a contract have to have full signatures.”

### ***Protect your golden hours***

All of the above tips are useless unless you have dedicated time in your day to implement them.



Many business owners get pulled in a hundred different directions per day, with endless questions and phone calls popping up.

Jay had a controversial method of solving this problem: closing his personal office to calls and visitors for several hours per day.

“No inbound calls, no inbound fax emails, whatever communication. Even to the point, the physical lock on the door,” said Jay.

While this seems extreme, when Jay experimented with it at a previous company, productivity went up a whopping 74% in the first year.

Once you train your staff to let you concentrate for those hours, they’ll

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know that they need to access you in the remaining hours of the day, helping you accomplish so much more.

If a method like that seems unattainable, you can start with a mini-experiment of your own. Take a piece of paper and write it down every time you get interrupted in the workday. Maybe an employee came in at 9:10 am, then a phone call at 9:55 am.

“Through one day, just one day, you’re going to learn two things: who are your time drains, and what are the questions?” Jay said.

### ***Good habits reap rewards.***

If Jay’s talk taught us anything, it’s that cultivating persistent good habits and routines can really pay off – literally.

When you stay organized, you complete projects on time. When you complete projects on time, clients and stakeholders take notice.

When you call clients quarterly to check-in and advertise at their children’s school play, they think of you first when a new project comes up.

And when you pay special attention to the proposals that you win and the projects that pay well and on time, you can set your company up for success for many years to come.

“Be inquisitive, be professional, be courteous,” Jay said in summary.

If you are interested in learning more about Mentoring Mondays or volunteering as a featured speaker, please contact Trent J. Keenan.





# Marketing & Promotion: Why it Goes Beyond Selling Your Services

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

*An abstract of The Geoholics Podcast – Geoholics Anonymous*

Marketing is something that's easy to put on the backburner. Particularly in smaller operations, day-to-day work can leave little time for big-picture thinking.

But marketing is an important piece of the puzzle to keep geomatics work flowing, particularly in the post-2020 pandemic world.

The good news is that there are many ways to approach marketing, and not all of them are focused on explicitly selling your services.

On a recent episode of the Geoholics Anonymous podcast, five business owners lent their expertise to break down why marketing is important and how they approach it. Here, we share their best advice.



## ***Build visual brand recognition***

From logoed hats for your employees to sponsoring the next local sporting event, one of the first pillars of marketing is getting your company's name out into the community.

This is the cornerstone of Trent Keenan's approach, owner of Diamondback Land Surveying based in Nevada.



Trent recognized early on that surveying is something most people need once or twice in their lifetime. That means they don't need to know the details of his services, but they do need to be able to think of Diamondback when they encounter the rare need for surveying work.

"My entire marketing strategy is branding and logo recognition," Trent says. "So when somebody does a search and they have five survey companies to choose from, they see one that's been a part of the community. They see the logo, they understand it. They understand what surveying is. It starts with a company name."

Branding is all about a long-term approach to marketing, not one that will result in overnight jobs and new business.

But it's paid dividends over time for Trent, who invests a healthy budget into sponsoring local youth sports teams and getting his logo and company name on jerseys, tv airtime, and radio broadcasts.

"Put yourself in these situations where you have a long-term and a visual logo all the time. That's been our biggest strategy since I started in June of 2008," he says.

This outside-the-box thinking can go even further when you make a connection between the community event you're sponsoring and the surveying profession itself.

For instance, Diamondback will survey the distance of a home run so that they can tie the measuring aspect of surveying into something fun that the general public will understand.

## ***Find a niche market***

Your next task is to ideally zero in on an area that you will specialize in—or at least find a way to differentiate your services from the competition.

Many surveying services are in essence the exact same thing, regardless of the company completing the work. That's why another important marketing step is identifying ways that you stand out, or specific areas where you excel.

Do some quick research into your competitors as starting point. Who are they? What do they specialize in? How do they convey that through any marketing they do?

"Find that niche that sets you apart from someone else selling the exact same service or product. We're all engineers, we're all surveyors. What sets you apart when you're sitting in front of a client?" says Jay Janisse, the survey manager for Jones and Carter in Texas.

Jay's found that one of the ways to excel in a crowded market can be not services themselves, but customer service.

"Something that we really promoted at Jones and Carter is service," he says. "It's that consistent product and the service. It's meeting deadlines. It's having daily or weekly touches with your client. This is where we are on the project. This is where we are on the budget. Taking stresses away from the client so they can focus on their life."

Steve Gangwal, a consultant based in Arizona, says that narrowing in on more focused marketing worked noticeably better for him.

"When I worked for a small suitable survey business for a while, one of the things I struggled with was, did I want to do this shotgun approach or a very laser-focused kind of approach as far as promoting our services? I actually tried both, but what was more successful for me was the laser-focused," he says.

"Instead of just going out there and saying, 'Hey, we do survey. Who needs a project, who needs this, who needs that?' I believe we fell down the path of more of a qualifications-based selection type of consulting services versus hard bid, low price. That didn't work for us," he says.

## ***Focus on internal marketing***

Marketing isn't just about communicating with the public and prospective clients. It's also about maximizing your internal connections, especially if you work at a large company.



Bill Swope is the survey business development manager at Half Associates in Texas. With close to 1,000 employees, most people already recognize the name of the company, so branding to the public is less critical.

As Bill's been working to get the company's new geospatial practice up and running, he's seen the value in internal marketing.

"I probably spend half my time talking with other groups just in my own company. I'm also looking for new prospects outside of the company," he says.

"Being as large as we are, I may not know that somebody else at the company has a contact with them, or has a relationship. And so there's a little bit more of trying to figure out where we are historically with firms that we're trying to work with."

Educating yourself on your own company inside and out can also help you to more effectively cross-sell.

"Learn about the services that your company offers outside of survey," Jay says. "I go to a lot of meetings with our business development person and I'm there to back him up on the survey side of things. But I know about our water department, I know about our sanitary, sewer, and our LIDAR department, all these things. Because cross-selling is huge when it comes to marketing."

When you're talking to a general contractor or an architect, they may not need survey services at that moment. But there's a big chance they're interested in other services that your company may offer.

You should also be able to speak to recent projects that your company has completed.

"Having some of those examples in your back pocket to bring out it goes a long way. I can honestly tell you that a lot of jobs I've picked up as a surveyor is because I've cross-sold another department, and it eventually came back around in a project and I was able to be a part of it," Jay says.

*Educate the public*

Cross-selling and internal marketing can be helpful when it comes to large companies and clients. When it comes to the more general public, your best bet is to hone your education skills.

“Surveying is just a different thing to try to market. Although we all understand what the product is, I still deal with a lot of clients that do not understand table a or issues like that. So I do feel like I spend a fair amount of my time trying to educate the public,” says Todd Bauer, the founder of Foresight Consulting in Indiana.

“A lot of the marketing material that I’ve done the last couple of years...has been about trying to give some insight to the general public to the backside of what we do as surveyors, because other than showing up mark and corners, they have no idea what we do.”

Even architects and engineers can benefit from increased awareness of what surveyors do, so don't hesitate to take the time to share your hard-won knowledge.

The true value of educating the public is generating goodwill. This means telling them when they need—and don't need—your services.

"I can't tell you how many times someone has called and they don't need a survey, or oh, just call this person at the county. All you need is a permit," says Jay.

Yes, you might lose the business, but you will leave a good impression.

“It could be educating someone so that you don’t even get the job,” Jay says. “But bringing it back to a marketing perspective, that person’s going to say, Hey, you know what? I’m going to call this guy for my next survey, because I was about to drop \$10,000 on something that I didn’t even need to. He could have screwed me over, but he didn’t. He told me what I needed to know. He educated me on some. So it builds that trust.”

### *Educate your employees*

In addition to educating the public, you also need to take some time to educate your employees.



Marketing isn't just the job of the company founder or the marketing team. In fact, it's a group effort that comprises every single employee at the company.

For Trent, this means starting with his field crew and providing them with attractive and branded company property.

"I let them treat their truck like it's an extension of the office. So we drive the nicest trucks, they're decked out with wheels and logos and that kind of stuff.

So it's the extension of the office," he says. "The client gets the same treatment whether they're coming in our front door or it's the truck showing up on the job site."

But you can't just give them a beautiful truck, you also have to teach them the responsibility that comes with it.

“Your field guys may not be some of the most sophisticated guys sometimes, but they’re out there working hard. I think it’s the small things, the attention to detail. Is your truck clean? Are your tools clean? Are your chains oiled up? Is everything organized?” Jay says.

You should also consider having a conversation with employees about the hours they are off the clock.

"I see branding carrying past what the company is and what people do outside of the company. A lot of our guys probably have shirts or hats or branded. Are they at the lake partying with that hat on?" Jay says.

Jay's company offers lots of training and classes for employees to help them prepare to present projects to city councils and deal with the general public.

"We have a Toastmasters club. We have a consultant that comes in and we do speaking classes and things like that. So that really goes a long way helping the company put that best face forward," he says.





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## ***Build your reputation***

Even if you do no formal marketing at all, you always have one thing that's working for you every day: the reputation that's formed as a result of the work you do.



Word of mouth is the most powerful marketing that you have.

"That's the way we kind of built our businesses, just word of mouth and letting people kind of come to us outside of our traditional marketing," Trent says, "Word of mouth will say, Hey, these guys are fair, they're reasonable."

Building a reputation takes time, but is your most powerful asset in the long run.

"I have a lot of contacts literally across the country at this point. And having that good reputation for years, it helps me out. Because people that I've known say good things about me and connect me with other folks," says Bill. "If you want to talk about branding, there it is right there in a nutshell. It's being responsible, being responsive to your clients, and being somebody that they know they can trust."

Nothing beats a good product, delivered with good service.

"There's a lot of noise out there. There's a lot of competition. Although you can put together a marketing plan and program, if you produce a superior product, you will get noticed," says Todd.

This is where marketing truly goes beyond the sale.

"It's not just about making a sale. It's about building that relationship," says Steve.

"There's obviously guidelines, there's regulations, laws that you need to be within, and transparency is important, and quality. Then just doing everything that you say you're going to do and how you're going to do it and being consistent with that."

When you act professionally and ethically, karma serves you well. It's a small world. And at the end of the day, good actions tend to reap rewards.



# 4 Challenges of Running a Survey Business

*An abstract of a Mentoring Mondays presentation from January 18, 2021*

Landon Blake is the President and Senior Land Surveyor at Redefined Horizons. He established his surveying business in February 2020, mere weeks before the current health crisis was branded a global pandemic.

With just under 12 months of business ownership under his belt, Landon joined us for a Mentoring Mondays seminar to share his insights. His goal was to share the significant challenges that he encountered during his first year in business.

## ***Two decades in the survey business.***

While Landon is running his own show for the first time, he's been surveying for over 20 years. A stickler for doing things the right way, Landon jokes that he decided to start his own business after getting fired from several jobs for being a rule-follower.



"One of the challenges I've had as a land surveyor is working for larger civil survey firms and just getting a civil side of the house to do things the right way," Landon said. He describes the challenges of convincing civil engineers to file a record survey, among other things.

That desire to do a thing correctly as a surveyor isn't just about being principled – it's also about protecting yourself under the law.

"If you're a licensed professional, it's somewhere in between being an owner and being just a regular professional," Landon explained. "There is a difference when you're a licensed professional, and you're signing and sealing your own work; you carry some responsibility with you."

He gave the example of when he was newly licensed and working for a survey company. Because the California statute of limitations is ten years, he asked his company if he could start keeping a copy of the file for each survey he signed off on. They told him flat out "no."

"I had a dilemma as a licensed professional; what do I do?" Landon asked himself. His solution? He made a copy anyway. The moral of this story, Landon said, was that as a licensed surveyor, you have to live up to the code of the profession, even when there is an unclear hierarchy of authority.

"You become personally responsible for your work. And there's a natural tension therebetween that desire to make as much profit as possible and doing things the right way," Landon said. His insistence on doing things right – not just under budget – was a driving factor to go into business for himself.

## ***Challenge #1: Misinformation in the marketplace.***

The first challenge Landon discussed was misinformation in the marketplace. Outside of the survey world, many people in other industries simply don't know what surveyors do.

The specific group that Landon discussed on the Mentoring Mondays seminar was real estate agents. During the early days of his business, Landon targeted them almost exclusively. He did an entire series of marketing campaigns and in-person educational presentations with 200+ agents – and got crickets.

Why? Landon was targeting private residential real estate, which in theory could benefit significantly from land surveying. He was also banking on the fact that real estate agents have a fiduciary duty to ask the right questions for their clients. But ultimately, he realized that agents saw surveyors as an annoying setback at best and a money pit at worst.

"Most real estate agents do not want to talk to a surveyor. Because all I'm going to do is find problems. And if I find problems, what happens to their deal? It goes away. We blow up their deal," Landon said.

He realized that zero real estate agents were interested in surveys, regardless of whether they represented the buyer or seller. Of the buyers and sellers themselves, only the buyers represented a potential client pool.

These days, Landon has abandoned his focus on real estate agents and targets buyers directly. “We’re trying to get directly to the buyer either through the Internet or through professional associations,” Landon said. “I have to try and get to the person whose money is on the line.”

### ***The myth about title insurance.***

Another common misconception Landon encounters is the idea that real estate title insurance offers protection to buyers. He hears people parrot this so often that he’s dubbed title insurance the most misunderstood product in the commercial real estate industry.

“Buying title insurance and thinking it’s going to solve all the real estate problems you might have is like going out into a blizzard in a bikini,” said Landon. “Title insurance doesn’t cover very much. It doesn’t. In fact, you could drive a school bus through the exceptions in your typical title insurance policy.”

This should not come as a surprise, as it’s not exactly a secret. If you grab a typical commercial policy, it states the many exceptions that would cause coverage to be withheld. For example, the “survey exception” says that title insurance will not cover anything that would be resolved or revealed by a properly executed survey. If you have a survey performed, the title company will remove that language. But most buyers don’t commission one.

“These aren’t mom and pop buying a home,” Landon clarified. “These are people that are buying and selling commercial property, district property, retail property. They don’t understand what’s covered by their title insurance.”

It’s clear that an initial survey’s cost would be preferable to denied coverage and the resulting lawyer fees. But sadly, buyers don’t discover this until it’s too late.

### ***Lack of clarity around survey cost.***

Another challenge Landon encounters regularly are clients who have no idea what a survey actually costs. Real estate agents often quote clients a ballpark figures that are thousands of dollars too low. This isn’t done purposefully; it’s just yet another result of misinformation. He has set out to rectify this by talking about survey costs regularly on Landon’s YouTube marketing channel,

“I was on the phone with a real estate agent today. He owned some property up in Castro Valley. It hasn’t been surveyed since the GLO went through,” Landon said. “It’s got some Caltrans right away running through it. There are no monuments set. I looked at some records and got some poking around. I figured I got two or three days crawling around the Hills there in the East Bay, trying to find some corners.”

He quoted \$20,000 for the job, only have the owners push back in confusion. Ten years ago, they’d had another survey done for only \$3,000. But it turned out that only four corners had been set. The wooden stakes the original surveyor had used were long gone. The owner had never received a copy of the survey. And there was no survey on file with the county. To Landon, it looked like an illegal survey.

“At the end of the conversation, the guy said, you know what, I’m glad I talked to you,” Landon said. “He said that I get it. I understand why it’s going to cost what it costs.”

This illustrates the need for increased client education, but it also points back to the matter of surveyor integrity. When surveyors cut corners – no pun intended – it can have painful consequences for landowners and future surveyors alike.

### ***Challenge #2: Finding your.***

At first glance, all surveyors may provide essentially the same service. But in reality, there are clear professional niches within surveying. As a business owner, it’s to your advantage to specialize in a niche.

Landon believes that most modern firms are too general. As land surveying becomes more professional due to sophisticated technology and equipment (such as UAV), it can be helpful to hire specialists when you need them rather than try to be an expert at everything yourself.

“Part of the way that you can be successful is by figuring out your niche and try not to take on the whole world, to take on everything,” Landon said. “It’s just it’s going to raise your equipment costs, and you’re going to need more people to be trained in more different things.” For now, Landon employs three full-time staff members who are all focused on one specific market.





*Don't chase work outside your market.*

It can be a challenge to remain committed to your niche and your company vision – especially when you want to maximize profits. The result is that you have to walk a fine line between pushing your team to learn and grow and not biting off more than you can chew.

Landon gave the example of a client that reached out to him in December 2020. It was a client that he had a great relationship with. The client needed some work done, and he was willing to pay generously. Landon was tempted to take the project but instead chose to refer the client to another firm, setting for a finder's fee instead of a big payout.

"I don't chase stuff out of my market," said Landon. "I said, hey, I would love that work right now. I could really use it. It's wintertime, and things are a little quiet. But that's not in my wheelhouse. I don't have the right toolset. I said, let me refer you to an excellent surveyor that does that kind of work." He referred the work to his friend's surveying company, where they had the \$300,000 UAV LIDAR set up that was perfect for the canal mapping job.

While Landon and his partner struggled with the decision to turn the project down, they soon felt some peace of mind. “We ended up helping with the project a little bit,” Landon said. “After I saw that thing on the ground about that second day, we were out there; I looked at my partner. And I’m like, man, I am so glad we didn’t bite this off. Cause we’d have got our butts kicked.”

The silver lining was that they maintained an excellent relationship with the client and also got to work alongside an expert firm and learn some new technology. At the end of the day, Landon was confident in his decision to remain faithful to his niche. As a brand new firm, you have to walk before you can run. You have to control your growth intentionally. And no matter how long you've been in business, you don't want to face the ethical dilemma of practicing outside your area of competence.

*Challenge #3: Transferring knowledge to junior staff.*



Perhaps the biggest key to business success in any industry is passing along expertise.

When staff members are adequately trained and empowered to succeed, they can contribute directly to the company's success. They are also often more likely to stay with a company for a long time.

But this is easier said than done. Education is a huge time investment for employers, and while the value of sharing expertise is clear, it often gets pushed to the back burner.

"If I get hit by a bus tomorrow, what happens?" Landon asked. "The answer right now is we're in big trouble. And so I want to not be in that place."

This topic struck a chord with all in attendance on the Mentoring Mondays call. Below is a summary of the collective wisdom they shared.

*Encourage self-sufficiency.*

We've all had that thought that perhaps the fastest and easiest way to accomplish a task is to do it yourself. That may be true, but it's also shortsighted. In the long term, business owners need to have team members they can rely on to share the burden and do a job well.

This comes by intentionally giving your team the space to be self-sufficient. It can mean giving your number two in command more solo tasks. Or it can mean letting someone new and green accomplish a job, even though it may be painfully time-consuming to watch.

This means working hard to get his number two guy licensed within the next 18 months for Landon. Not only does he want him licensed, but he also wants him confident. “We were out today, and he did a boundary survey, found about 15 corners by himself,” Landon said. “And I could not have been there today, and he’d had done all right. I was there cause he’s still learning, but I’m always thinking about how I can make that knowledge transfer process more efficient.”

*Use video as a training tool.*

One of the ways Landon has discovered to increase efficiency is by using video as a training tool. It's another method that's very time-consuming to set up on the front end but then saves him an enormous amount of time later.

For example, you can personally sit down with every new team member and give the same talk over and over. Or, you can record the lesson once and then instruct them to watch the video.

“Now, instead of having to stop and teach the same thing again, the second or third or fourth time, I can tell my team member, Hey, go watch this video that I recorded. And then when you come back, let’s sit down for 10 minutes and



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talk about it,” Landon said. “I think it allows us to scale the learning without the cost, which I’m excited about.” Landon specifically likes video as opposed to a written, textbook-style learning format. While you still need written guidelines and workflows, videos are more engaging, and many people learn better on a screen.

“I’m trying to get my knowledge out of my brain and onto paper in a manner that my people can follow. And that’s a massive effort. That’s constantly overwhelming me,” Landon said. “There’s a lot that I’ve just assimilated over the last 20 years that I’m trying to put down on paper for folks and put in a video for folks.”

### ***Reduce turnover.***

Having a strong and supportive company culture is the key to a stable workforce. The surveying community, like many industries, suffers from a high turnover rate. Every time an employee moves on, you need to find and train a replacement. And that process is quite expensive and time-consuming. Because even if a new employee has the technical skillset in place, they aren’t yet an expert at your business and your niche.

In order to retain staff, you need to support and empower them. And when you regularly transfer expertise and reward the accumulation of knowledge, you will win their appreciation. Encouraging and inspiring your team members might seem daunting, but it can happen in several small ways that add up.

For example, imagine an employee is offered the chance to work at a new firm. The pay and benefits are roughly the same as their current company. How will they make that choice? If their current firm has mentored and supported them, they will likely feel no urge to move on to a different firm. But if the new firm is known for its great mentors and culture, and your firm is not – you have a problem.

### ***Connect education with compensation.***

Landon is currently running a new experiment in an attempt to motivate and retain his younger team members. His most unique professional development program aims to reward education with compensation directly.

How does it work? It’s a point-based system where points earned translate to a higher paycheck. “You earn points for the stuff you learn on the job, and we track it. You’re evaluated every month, and we track what new skills you’re learning on the job, and those are assigned points. And then we also have points you can earn off the job. So by taking a community college course or getting one of your CSTs. Or you can earn points by watching videos and reading articles,” said Landon. “And then what we do is we tie that directly into your compensation.”

They set up the program so that a certain percentage of points can be earned on the job, but the rest need to be achieved outside of work. This incentivizes employees to pursue professional growth both on and off the clock.

This system also prevents employees from feeling discouraged when hard work goes unrecognized – because it doesn’t. “I don’t want a situation where I’ve got somebody that’s been working for me for a couple of years, and I failed to fail to recognize their growth. Because that’s a problem,” said Landon. “That forces me as an owner is to sit down and say, hey, I hired this guy who was a dipstick three years ago, and I still think he’s a dipstick, but the reality is he’s not a dipstick anymore. He’s at three years of training under my partner and me. And here are the things he knows that he didn’t know three years ago. Am I paying them appropriately?”

Landon hopes that over time, the program serves to both increase retention and encourage employees to invest in their own future.

### ***Remember that training scales over time.***

The great news is that once you successfully train a few key people properly, the burden of training new employees can be shared. The more diverse your team becomes, the better you can have training relationships between junior and senior staff members.

“I didn’t properly anticipate how much of the training I was going to have to do, just because we’re a small firm,” said Landon. “I look forward to when I’ve got a couple of people underneath me that can take on some of that, so as you grow, your ability to train scales, right? Because if I train three people now, those three people can each train three people.”

When you first start, the training burden can seem difficult to bear. But it’s important to remember that every hour you spend training a team member is an investment. Whether they are an 18-year-old new surveyor or a 30-year-old surveyor about to be licensed, the time you spend training is never wasted. It pays dividends down the road.

### ***Challenge #4: Balancing free and paid expertise.***

The last challenge that Landon discussed was that of walking the line between free and paid work. While educating the public is undoubtedly part of the responsibility of being a land surveyor, you also don’t want to let it put you out of business.

Landon likened it to a land attorney, who at some point has to stop answering questions for free and get a client to sign a contract. “One of the things that I’ve learned from attorneys is attorneys have to be careful, because, at some point when they’re given that advice, they acquire a responsibility to that person, whether they’re under contract or not,” said Landon. “I’m not exactly a hundred percent sure how those rules apply to surveyors, but it’s made me a little more cautious about how much advice I’m willing to give.”

So while Landon does take many phone calls at the office, he tries not to spend hours doing work that would typically be paid. Spending two hours on multiple calls a day can quickly eat up your workweek, and clients are quick to devalue your time.

“I had a gal just a month ago that told me she was going to hire me for a survey. I pulled all the maps. I figured out where the corners were. I was answering questions about her zoning. I spent two days with this gal trying to get her prepped and ready to sign a contract,” Landon said. “And then she called me the third day and said, hey, I found an old retired engineer that lives two blocks down from me. He’s going to do my survey for \$1,500 bucks.”

### *The argument for free expertise.*

The Mentoring Monday group seemed polarized on this topic, with some attendees saying that they would educate clients no matter what. Some argued that you leave potential clients with a positive experience when you position yourself as an educator. Even if they don’t secure your services personally at that time, they leave thinking of you as an expert and are ready to refer your name or utilize you in the future.

It’s clear that there is no one “right” way to straddle the line between free client education and paid client work. For Landon’s fledgling company of three employees, time is precious. He has learned through trial and error to act accordingly. And when he does give out a hefty serving of free advice, he requests something like a review for the company website in return.

“That is one way for me to get a little bit of value,” said Landon. “If you are helping people and demonstrating some value, it doesn’t hurt to ask for a little referral, a little testimonial. A lot of times, people will do that for you.”

If you are interested in learning more about Mentoring Mondays or volunteering as a featured speaker, please contact Trent J. Keenan.

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**CHEAP & FAST** WON'T BE **GOOD**





# ALTA Surveys from the “Other Side of the Table”

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

**An abstract of a Mentoring Monday’s presentation from October 19, 2020**

As land surveyors, it’s easy to get caught up in the day-to-day work and not stop to look at the big picture. But after a long and successful career, Jay Kay Seymour can say with certainty that there is value in stepping back and looking at your business from a different angle – the client’s perspective.



Jay is a professional land surveyor with 50+ years of experience and is the owner of Professional Land Consultants, Inc., Semi-retired. One of his favorite things is mentoring younger surveyors and sharing his insights from decades in the business. Jay joined us on a recent Mentoring Mondays call to talk about ALTA surveys and best business practices.

“We as professionals all understand our side, and we get a little frustrated saying that idiot on the other side of the table doesn’t know what he needs,” said Jay. “We have to keep in mind first and foremost, that idiot pays our bills.”

If you want to build a truly successful surveying business, you need to talk to your clients carefully. It would help if you also vetted them. You need to ensure that you are landing ideal clients with the

opportunity for repeat business. And it would help if you protected yourself from lawsuits and lost revenue. In this article, we’ve summarized Jay’s advice.

## ***Find a surveying specialty***

One way that you can impress your clients and find success as a surveyor is to pick a specialty. This will help you thoughtfully pursue continuing education and will serve to make you more competitive.

Jay made the comparison to a medical specialist. A cardiologist specializes in heart issues, while an oral surgeon specializes in dental issues. Similarly, you may be in an area that never does an ALTA survey, and that’s OK.

“We surveyors tend to think we can do it all. And let me be your wake-up call tonight,” said Jay. “Find what you do best. Stay with that, expand out from that to do similar type projects. I never built a high-rise building. I never did a pipeline. But I did 3,000 ALTA surveys.”

## ***Don’t survey outside your backyard***

It might be impressive to meet a surveyor who’s licensed in dozens of states. But most surveyors do most of their work in one single area. And there is a good reason for that. When you focus on one area, you have the advantage of knowing things inside and out. You can better identify the right projects and can complete those projects faster.

“We will not survey in San Diego or downtown San Francisco, or for that matter in the middle of nowhere, Bishop. Because each area has its own local color, and you’ve got to be careful about that,” said Jay.

When you know the area, you know where the blocks don’t close. You know where there have been lot line adjustments that never got recorded. And you know where lines are 1- 20 feet off.

## ***Follow in the footsteps of your predecessors***

It’s important to keep in mind that surveyors are subject to liability. Jay has worked for the government for many years and knows firsthand that the state board for every state is not there to help surveyors. It’s there to revoke your license if you are accused of wrongdoing.



As surveyors, the burden to prove innocence is on us. We are guilty until proven innocent. “When a charge is brought against you, you then have to go back to your documentation, to your boundary establishment and analysis, all the information you have, and prove to everyone that you are right,” said Jay. Whether you are doing an ALTA survey, a boundary survey, or a staking document, the number one rule is to put down footprints.

“You’ve got to follow in the GLO footsteps. Those same footsteps are the same ones you put down on everything you do. Everything we do is subject to liability. We have to remember that. It may be a long time before it pops up, but it will pop up,” Jay said.

It doesn’t help that surveyors often get a bad reputation. According to outsiders like title officers, surveyors are often seen as being late, taking inconsistent measurements, and disagreeing with other surveyors. Many outside the profession do not even see surveyors as professionals. Instead, they see them as craftsmen similar to a carpenter. This makes it all the more important to be consistent, set high standards, and communicate professionally with clients.

### ***ALTA Surveys***

ALTA stands for American Land Title Association. An ALTA survey is only used on a property where the money is exchanging hands to protect a statute of fraud by obtaining title insurance. You don’t do ALTA surveys on single-family homes. It’s almost exclusively a survey done for commercial and industrial buildings, residential multi-family units, or apartment buildings.

Because surveying is, in essence, a historical profession, it is interesting to note ALTA’s changes and progression over time.

1941: American Congress on Survey Mapping (ACSM) was born; died in 2012.

1946: ACSM established minimum standards.

1962: ATA/ACSM – first attempt at maximum positional tolerances.

1979: Standards were not jointly accepted by ALTA; never enacted.

1986: Class of surveys; 1<sup>st</sup> table of minimum standards by ALTA.

1988: Table 3: 16 additional items added to the standards.

1991: Interpretation and application of Table 3.

1994: Measurement standards; HUD requirements added.

1997: Revisions to the measurement standards; changes to HUD.

1999: Optional Table “A” removal of Class Urban / Rural 1<sup>st</sup> NSPS.

2005: Clarification of Table “A” Cert changes; NSPS 2003 standards.

2011: First major revision of the standards in over 50 years.

2012: ACSM morphed into NSPS. 48 States (all but two) are affiliated.

2016: “House cleaning” items; clarification of the 2011 standards.

2021: “House cleaning” items; clarification of the 2016 standards.

This history has important implications. The thing to recognize is that if a client calls about an old 1999 ALTA survey and wants it updated to the 2020 standards without completing a new survey, you must refuse. You can only certify to the current statutes in place.

You must also recognize what is allowable under the law for insurance purposes. Sometimes clients or lawyers ask you to do a certification, but again, the answer is no. “If you change the certification, it is not an ALTA survey. They cannot get ALTA insurance,” said Jay. “And that closure is going to get held up and cause a lot of problems.”

### ***Be solution-oriented***

It seems obvious, but surveyors should consistently and genuinely ask clients what they need. Jay said that often a project is like a game of telephone. The client tells someone they need a tire swing, and what they get is a dining room chair.

There is probably nothing more critical for Jay than the client relationship and talking to your clients with your problem-solver hat on. The client isn’t interested in hearing you speak or hearing about what equipment you operate. Only once you understand what your client needs can you go about convincing them that you are the right firm for the job.

Being solution-oriented opens doors. Jay described how he starts with small talk in order to avoid going straight to money talk. “The first thing they’d say is I need you to ALTA survey, and we want you to get it for me. How much will it be?” said Jay. “Whoa, cowboy, let’s hear about where you are or what it is. Do you have a title report? Then you ask all those questions about what you want to do in a sales presentation. We, as surveyors historically, are not good salespeople. Ask them questions that they have to answer you back.”

In this same scenario, imagine that the client said they didn’t yet have a title report. Instead of telling them to go get one and call you back, offer to contact their title officer on their behalf to get the ball rolling. While you aren’t yet guaranteed the work, you’re now 90% closer to getting it should the client move forward. When clients see that you are trying to solve their problem, they see you as a fellow human being who they can treat with a sense of appreciation.

### ***Research your clients***

It's a good best practice to look at every new project with a fresh set of eyes. And that includes working with repeat clients. "What good is it to take another ALTA survey from the guy that owes you for the last three?" asked Jay. "It doesn't say bank on my forehead. It says professional and surveyor. I can't keep carrying these people on the books. This seems funny, but you need to do it when you get busy."



Sometimes, the person who's supposed to be footing the bill for a survey project isn't obvious at first glance. You may say yes to a new project and think that you're working with a new set of developers. But between the LLC and something else, the billing address on the contract may be the address of an existing client who owes you money. "Review a title report, backup documents, standards, and specifications of the deal. Qualify, quantify, identify," said Jay.

Investigating clients can also result in big payoffs and much more work than the survey that's first discussed. One example Jay gave was from back in 1987 when an ALTA survey was requested on an undeveloped area in Palm Springs. His research showed that the person behind the project was a well-known and well-funded retirement community builder.

"I went to the owner of my company. Now I said, look, boss, they want the ALTA survey and the engineering design survey for free, but they'll give us a contract to build 22,000 homes.

And the full engineering." His boss at the time refused, on the grounds that he didn't want to do a free \$9k ALTA survey. If his boss had dug into the project as Jay had, the company would still be busy working on that project over 30 years later.

Finding new business

Now that we've covered how to vet projects that come your way, it's time to dive into a topic that Jay is passionate about – how to market yourself and proactively find new business.

### ***Assess your won and lost bids***

"One of the problems we have with most companies is we spend a lot of time, money, energy, and effort on proposals and don't get them," Jay said. His advice? Take a good close look at the past projects you've bid on. How many were construction, staking, ALTAs, etc.? And of those bids, how many did you win? It's important to assess and learn from your experience rather than continue blindly into each new year.

### ***Spend more on marketing***

You should also rethink your idea of marketing. Marketing doesn't have to be schmoozing on the golf course, as fun as that may be. It can also be a dozen small and easy things. Strong businesses typically spend 12-15% of their gross revenue on marketing business development.

### ***Use the eyes of your field crew***

"The reality is my best marketer are my field crews," Jay said. "They're driving around. They see signs for sale. I told all my crews to take pictures of that sign 'for information on this property call this number,' because it may be vacant now, but it's probably going to be developed."

### ***See what your local planning departments are up to***

Explore what local city/county planning departments have in the pipeline. It's possible they may not yet have a surveyor assigned to a new project. They could also be ready to replace someone they're unhappy with. "They may be mad at the surveyor because he did a terrible boundary survey and ready to dump him and give the engineering and construction staking to somebody else," said Jay.

### ***Order business cards***

It's a no-brainer that the owner or person in charge should have business cards. But you should also order business cards for your entire team. They are very inexpensive, and when given to both the office and field crew, they make everyone feel like they're equally professional and ready to network should the opportunity arise.

### ***Make phone calls with confidence***

If you see a sign about a property, call the number on it like you mean business. Jay has called up Cushman and Wakefield, a huge nationwide company. When he dials the generic 1400 number, he says, "I'm looking at your sign at 444 Ocean Boulevard, downtown Long Beach, California. Who do I need to talk to?" The more aggressive and assertive you are on a phone call to the gatekeeper, the faster the receptionist or gatekeeper will let you through.



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## ***Represent the seller***

Financially, Jay explained that it makes sense to represent the seller rather than the buyer in any given transaction. “You want to work for the seller because they own the dirt, the wood, and the concrete. They have a vested interest in the deal,” said Jay. “The buyer is a hotshot that showed up, opened up the escrow, put \$10,000 to \$1 million dollars into an escrow account, and wants to buy a piece of property.” When escrows fail to close, the culprit is almost always the buyer.

The other advantage to working with sellers is that they provide an opportunity for repeat business. If a seller enjoys working with you to complete the sale of one property, they may choose to work with you again when selling or buying another.

“I prefer if I can to do the seller also because when he sells, he’s probably going to want to go buy somewhere else, while the buyer might be out of money, and that’s his one deal,” said Jay. “They could also be a big developer who’s going to buy several things. So you have to always quantify where you are, see who the people are, and see if you can get more business out of them.”

## ***Be a business person first, and a surveyor second***

13 pta good business person, you won’t be around next year to show me how good a surveyor you are,” said Jay. “Change your focus: business-oriented first, then show the world what a good surveyor you are.”



Jay told the incredible story of working on a Thursday afternoon in Inglewood, California. He was getting ready to leave for the weekend when a call came in from an architect in Paris. The architect said that he needed an ALTA survey by Monday morning for the Forum, the stadium of the Los Angeles Lakers. It turned out that Wayne Gretzky needed the survey as part of his deal to join as a player and business partner of the Kings, who owned the Forum at that time.

While many surveyors would have written off such a quick turnaround as impossible, Jay knew he could make it happen because he had worked with the company that built it. He also knew that with a deadline like this, he could charge practically whatever he wanted. He had his accountant send over the bank wiring information and got to work.

“I put four survey crews out Saturday and Sunday,” said Jay. “We knew what it was. It was a circle. We counted parking stalls and drew them up. And this was 1988, folks. Does anybody want to guess how much money I got for that survey? \$85,000.”

Being a savvy business person meant understanding that he could work successfully within the quick timeline and understanding that a rush job was incredibly valuable. “You may be able to jump through all those hoops and understand if nobody else can do it. And you have the inside track. You’re the one that should do it and elevate your price. It’s not a \$20,000 ALTA anymore.”

## ***Navigating contracts successfully***

When you begin a project, there are certain things that you should consider from a business standpoint. When creating contracts, Jay suggests considering the following questions.

### ***How many attorneys are involved in the transaction?***

Each one will need copies of your survey changes when they occur. And each one will send it back to you with questions, comments, insertions, and deletions. It is wise to phase your contract to state that if revisions and changes will be made by all sets of attorneys, that it is outside the scope of the original contract and subject to T&M fees.

### ***Are your state requirements spelled out in the contract?***

You should know your state requirements for contracts inside and out – and your client should be aware that you are well informed. Each state has minimum standards as set by state law. Many states mandate that you have a written contract in place before work commences. And according to the executive director of the California State Board, the number one case brought against surveyors is a violation of a contract. That’s why it’s doubly important to go into each project with your eyes wide open and provide an option for both parties to get out of the contract if need be.

### ***Does your contract spell out inclusion and exclusions?***

Many surveyors focus on the contract scope of work by stating what is included. But Jay believes it can be just as important to spell out what’s excluded. For example, in his own proposals, he states that if the TOD report is 2+ years old and no backup documents, upon receipt of a new title report and the associated backup documents, we will stop the lump sum phase or renegotiate or go T&M until we get back on contract. It’s important to be deliberate about what services you are and aren’t rendering.

### ***Consider new technology***

When applicable, take new tech and make it work for you. One example is scanning, a technology now popular with planners that maps out what the inside of a building looks like.

“The bottom line is there’s a new market, a new revenue stream for our surveyors scanning inside,” said Jay. “Our paradigm is changing.” Today, it’s possible to make a living doing something very niche, like scanning office spaces.

### ***Invest in community advertising***

Increase the visibility of your company name by getting it on sports fields and musical programs. It’s a win-win because your advertising dollars are supporting your local schools and sports activities. “Baseball fields, they have those little banners, 1-4 foot banners,” said Jay. “You want to see your company name out there in center field.” Don’t forget free advertising space, like putting signs on your cars and trucks.



### ***ABC: always be closing***

Finally, follow the ABC rule: always be closing. Every phone call you make to wrap up an existing project should include putting out feelers for future work. “When I call my client and say I’m ready to deliver this, I say, what are you doing next week? What’s your next project?” said Jay. “Ask the question.” If you don’t ask when he gets busy, his company will fall back on the same de facto surveyors. Jay is also an advocate for handwritten notes on invoices, thanking clients for their business.

Jay’s final words of wisdom included tips like the following:

- Avoid liming your workload to 1-3 sources or revenue streams. If you only work on single-family projects and that dries up, you’re in trouble.
- Never lower your hourly rate during economic downturns. Discount your fee instead.
- Avoid meeting during prime working hours. Aim for lunch or dinner meetings to save time.
- Remember that every document you send out needs a certification.
- Follow up on every job you bid for.
- Whenever possible, ask for lump sum payment terms versus time & materials.
- When you don’t win business ask what you can do better next time.

If you are interested in learning more about Mentoring Mondays or volunteering as a featured speaker, please contact Trent J. Keenan.



# Servant Leadership

*Prepared by Trent J. Keenan, PLS*

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*How to run a successful surveying business with a servant leadership style.*



Success as a business owner requires you to possess more than deep expertise as a Professional Land Surveyor: you must also be an effective leader.

As the generational transition occurs, millennials will comprise 75 percent of the global workforce by 2025 and are already emerging as leaders in technology and other industries. They want to work for companies that promote innovative thinking, develop their skills, and contribute to society. Additionally, many millennials are of the opinion that businesses are not doing as much as they could to develop their leadership skills and that leaders need to be nurtured, especially as they cannot wait for senior positions to become available to them.

The larger your business grows, the more important leadership skills become. Yet even when you run a business as a sole proprietor, you likely rely on the services of contract employees or a long-time mentor to help you—making leadership skills a valuable asset at every level.

While traditional views of leadership are characterized by a top-down, authoritarian approach, there is another style of leadership that has gained increased popularity in recent years: ***Servant Leadership***.

## ***What is Servant Leadership?***

At its core, servant leadership takes the approach of putting team members and employees first.

Think of the patriotic call of John F. Kennedy urging Americans to “*Think not what your country can do for you, but what you can do for your country.*” Similarly, servant leaders don’t prioritize business gain above all else; instead, they look for where they can lend support to employees so that every individual—and therefore the business as a whole—can truly thrive.

While there have been servant leaders throughout human history, the concept was coined in 1970 in an essay by Robert K. Greenleaf (1).

## ***Definition of a Servant Leader in Greenleaf’s Words:***

*“The servant-leader is servant first... It begins with the natural feeling that one wants to serve, to serve first. Then conscious choice brings one to aspire to lead. That person is sharply different from one who is leader first, perhaps because of the need to assuage an unusual power drive or to acquire material possessions.”*

Greenleaf recognized that there is a spectrum of leadership styles. On one end of the spectrum are people who are “leaders” first, and on the other end are those who are “servants” first. Every business owner falls somewhere in between those two extremes.

Next, we will explain the value of the servant leadership approach and how you can begin to cultivate servant leadership traits in your own business.

## ***The Value of a Servant Leadership Approach***

Servant leadership is valuable because it places focus on the holistic well-being of employees, companies, and communities.





This is particularly relevant to land surveying businesses, which literally help to shape the physical form of communities and serve local cities and residents with quality work.

When done well, taking a servant leader approach isn't just good for society as a whole, it's good for business. Engaging team members, building trust, and improving team relations are all benefits of servant leadership that ultimately benefit business as well. That's because servant leadership also has the ability to:

1. Promote employee growth
2. Promote staff retention
3. Promote community goodwill

### ***Servant Leadership Promotes Employee Growth***

Servant leaders are interested in sharing power, not hoarding it. When it comes to employees, that means servant leaders want to ensure employees have what they need to thrive on the job, and beyond it.

Thriving on the job might mean that they need training in order to do their existing job well. It may also mean that they need mentorship to guide them to the next phase of their careers.

As Land Surveyors, we should all be acutely aware of the need to groom our existing talent for the next stage of their careers. When you make an effort to learn what resources and support your employees need, they will be empowered to take action to grow their knowledge and expertise. And the more expert your employees become, the better you can serve your clients and community.

### ***Servant Leadership Promotes Staff Retention***

There's a popular saying that people don't quit a bad job, they quit a bad boss. In the current land surveying climate, firms that have qualified staff simply cannot afford to lose them. Professional surveyors are retiring at a faster rate than they can be replaced, and many firms are experiencing a higher demand for surveying services than ever before.

According to Harvard Business Review (2), research has shown that when staff members choose to stay in the same job, it's typically because it's a job they enjoy. Specifically, a survey of employees who stayed at the same job felt that they used their strengths 33% more often and felt 37% more confident that they are developing skills that would progress their careers.

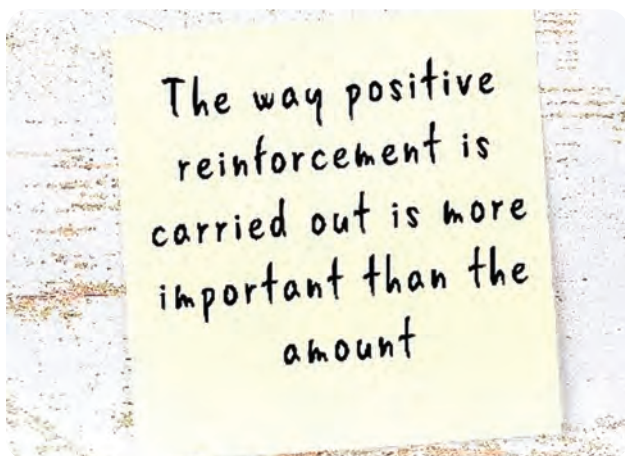
This is a strong case for a servant leader approach that prioritizes things like employee work-life balance, fair pay, skill progression, and career growth as described above.

### ***Servant Leadership Promotes Community Goodwill***

The best servant leaders look beyond the internal workings of their organization and to the greater community ecosystem in which it exists. As surveyors, the more visibility and goodwill we have with our local communities, the more our businesses can thrive.

Often, supporting your community has the added silver lining of marketing your surveying business in the process. When you do things like sponsor youth sports and participate in career fairs and events, you educate others on the role of land surveyors and the value provided by your company.

### ***How to Become a Servant Leader***



The ultimate goal of servant leaders is to promote a working environment that satisfies team members both personally and professionally. When employees are happy and supported, they can do their best work to help your firm succeed.

Here are five concrete ways that you can pursue a servant leadership approach.

#### **1. Provide Positive Reinforcement**

When employees are aware of the positive impact they are making at work, it creates a sense of confidence and pride that spills over into the subsequent work that they do. Don't hold back from telling employees where they did a good job and how their actions contributed to the overall success of an organization or project.

For example, did a recent client have kind words to say about an individual team member or a job well done? Make sure that you pass those comments on to the employees involved. Even when something bad happens such as an accident on a job site, you may be able to highlight the quick thinking of an employee and how they kept a bad situation from becoming worse. According to Forbes (3), this type of consistent feedback serves to build resilience and keep morale high.

Positive reinforcement can also take shape beyond words. Entrepreneur(4) recommends showing employee appreciation with reward programs or events that teams can look forward to. For example, we hold multiple companywide events throughout the year. From renting a suite at the local baseball park, Top Golf Events for just adults, or a private event for the entire family at the local waterpark, while other companies might take a second look at their bonus and benefit programs.

## 2. Keep Two-Way Communication Open

Servant leaders excel at making the voices and opinions of others feel heard. This means you can't succeed with just a top-down communication approach, where all updates and instructions come from you as the business owner. You also need to make sure employees can contribute to the conversation.

Perhaps this takes the shape of a weekly "all hands" meeting where each employee has a moment to bring up their workload and any associated challenges. Or perhaps it's a recurring one-on-one check in every week or month to align with your key team members.

Most importantly, these conversations should offer an opportunity for employees to provide honest feedback. Employees should feel their concerns and questions are heard—and they should have confidence that you'll do something about them. You never know when an employee will have an insight or idea that transforms one of your processes or your entire business model for the better.

## 3. Encourage Professional Development



As mentioned previously, servant leaders aren't obsessed with being *the* one and only leader. They also want to provide their team members with a path to leadership and growth as well. In surveying, there are logical paths to advancement that you can encourage, such as education and certifications that will take an employee closer to their career goals, or by enabling your team to attend professional conferences.

Sometimes, passing on your own expertise and mentorship can be powerful in itself. Brandon Montero, a senior survey manager at Okland Construction in Arizona, likened mentoring to the factor that can help your employees truly thrive, versus just get by.

"We could picture a plant just coming up in a patch of dry dirt, all by itself," he said. "On its own, maybe it'll thrive. Maybe it's going to make it, depending on the conditions. Or could we add water regularly? Could we add nutrients regularly? Sure, it could grow on its own, but could it really thrive?"

The more we invest in mentorship and professional development, the more we equip the next generation of surveyors for lasting success.

## 4. Care About People on a Personal Level

Caring about your employees goes beyond providing them with a steady paycheck and giving them tools to succeed on the job. The best bosses also show an interest in employees on a personal level.

If an employee is struggling at work, chances are there are external causes, such as the health of a family member or a financial hardship. When you are in tune with employees on a big-picture level, you can better support them and learn their lasting loyalty and trust.

Today's workforce wants to feel valued and have an element of being autonomous. Consider providing flexibility so that employees can better manage work-life balance. Why not let employees head home from the job site, and email their data back to the office via VPN? As long as you get the results that you need, it may be less critical that all work happens from the confines of the office.

You'd also be surprised what employees will share with you if you give them an opportunity to open up. For example, one surveyor noticed

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he had an employee struggling to get to work on time every morning. It turns out that his family only had one car. He solved the problem by letting the employee use a company truck. It took an incredible burden off of the employee and showed that his employer truly cared.

## 5. Lead by Example

Most importantly, being a good servant leader means identifying the type of business owner you want to be and then leading by example.

During a business crisis or recession, what attitude and outlook do you want to share with your team? If a team member is struggling due to personal reasons, what level of compassion and empathy do you want to convey?

Encourage your team to follow your lead in putting others first. Don't be the type of leader that says one thing in a company mission statement or employee handbook, but then they turn out to be empty words.

Make an effort to live out your philosophy where everyone can see.

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1. <https://www.greenleaf.org/products-page/servant-leader-download/#:~:text=Powerful%2C%20poetic%20and%20practical.,in%20the%20quality%20of%20society.>
  2. <https://hbr.org/2018/01/why-people-really-quit-their-jobs>
  3. <https://www.forbes.com/sites/forbescoachescouncil/2020/05/26/why-servant-leadership-is-more-important-than-ever/?sh=68eb51f82861>
  4. <https://www.entrepreneur.com/article/422764>





# Mastering Safety From the Top Down

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*



A strong and safe company culture isn't created in a vacuum. It comes first and foremost from a company's leadership.

Culture is woven from the daily choices made by employees at every level, but the stage is set by those at the top.

From employee onboarding to safety toolbox talks to the difficult decision of knowing which employees need to be let go, perfect culture and zero-incident safety are a target that you'll never hit. It's something that you're always striving for.

Helping to shape company culture can be an art form.

Kent Groh and The Geoholics podcast team recently interviewed two titans of culture: Mike Bontrager, VP General Manager for Alston Construction's Arizona office, and Brian Owens, VP of Safety & Team Development for the Buesing Corporation.

Mike described his days as a turnaround specialist helping struggling offices make incredible comebacks, while Brian shared why safety culture should be approached as an inverted pyramid.

Together, their advice provides a strong foundational approach for companies both large and small.

## *What a "broken" company culture looks like*



Mike was working at The Weitz Company as President of the Southwest division when the great recession of 2008 hit hard.

As things slowed down, Mike's superiors complimented him on the job he'd done building the Southwest office, and asked if he'd be interested in turning around a company in another division that was struggling.

The company in question was headquartered in Honolulu. Mike soon found himself in a tropical paradise—but facing a tough challenge.

Yes, the company was doing poorly. But the main issue was a cultural one. And it stemmed from the person who was running the company. It took about 18 months to train the owner to run a large operation versus a small operation, and took a lot of behind-the-scenes effort. After that success, Mike found himself with a new career title: the turnaround guy.

The most toxic culture he encountered was an office in Arizona.

Mike had never seen a culture this broken, ever.

"People lied to each other. People gossiped about each other. People stole from the company," Mike said.

In one case, three employees were responsible for ordering snacks for the office kitchen. They would purposefully over-order each week so that they could load the extra supplies into their cars and take it home every Friday.

In another instance, a superintendent would buy Home Depot gift cards with the pretense of handing them out as a safety reward on his job site. It turns out he was keeping them for himself—to the tune of over \$10,000.

These examples sound extreme, but it's a clear picture of what can happen when key values like honesty and integrity aren't allowed to flourish.

### ***Turning a negative culture around***

Here's what Mike would typically do when faced with a struggling company with severe cultural problems:

1. Interview all employees
2. Remove employees who don't fit
3. Hire employees who are motivated

### ***Interviewing employees***



Mike's process of turning around a company would begin with an interview of every single employee. He found that it was important to talk to everyone one-on-one in order to take the pulse of the company and see the big picture.

"I asked everybody the exact same questions and put it all on a spreadsheet. What I was doing is getting a picture of the company, getting a picture of the people, trying to figure out what was wrong. So I was just learning," Mike said of these exercises.

Mike commonly asked questions like:

What's wrong with this place?  
How do you get along with your colleagues?  
What markets do you think we should be in?

Why aren't we succeeding here?

"The reason I asked everybody the exact same question, I never deviated, was because I wanted to hear the different answers that everybody was giving. It was pretty clear that everybody had somewhat of a different idea of what was going on there," Mike said of the Arizona office.

"We figured out we needed a vision," Mike said. "We really needed to reinforce the values we had to get the bad actors off the place."

### ***Terminating employees***

In many cases a totally broken culture requires letting people go. At one office, Mike interviewed 34 employees. Afterwards, his instinct was that only 4 of those people were keepers who should remain with the company.

"Of course, you can't just walk in one day and go 'you 30 people are out.' You can't do that," Mike said. It's a careful process that starts with hiring a stellar management team to turn things around and set the tone for the culture you want.

Next, it's a process of carefully explaining to employees what's needed versus what they are doing, and letting them go in a respectful way.

Mike would tell employees: "You've got strengths that you can use at other companies. You just don't fit here. It's not that you're bad. It's you just don't fit where we're headed," he said.

It's never easy. Mike estimates over the years he's been responsible for laying off about 200 people, yet he's done it in a thoughtful way. This means that he still has employees he's terminated who stay in touch with him and use him as a professional reference.

And in the case of that Arizona office that was so damaged and hadn't made money in six years? Under Mike's oversight, they increased revenue by \$60 million in just three years.

### ***Hiring motivated employees***

Once negative or poor-fit employees have been weeded out, the next step is to find people who are truly motivated to succeed.

"If you have to motivate people all the time, you probably got the wrong ones," Mike said. "You need people that are achievement-oriented, and they have an ethical compass that points in the right direction."

To this end, Mike would hold strategic cultural meetings. He regularly gather his management team to talk about the culture they wanted to build and the results they wanted to see.

"It's not big grandiose things. It's Hey, when somebody emails you, email them back in 12 hours. If somebody calls you, call them right

back even if you don't have the answer. It's just simple little stuff. Be positive. Lean into problems, never run away from them. Just all the cliché things that you do," Mike explained.

His advice to professionals is this: if you want to find opportunities, look for the challenges that everyone else is running away from. That's where the learning and growth will truly happen.

### ***How safety culture connects to company culture***



In the surveying world, there's perhaps nothing more important than a company culture that prioritizes safety.

Workers in the engineering and construction industry face many hazards. Construction sites in particular are perhaps one of the most dangerous places to work in the world.

Legally, for example, a general contractor can't place all the burden of safety responsibility onto subcontractors. In other words, safety is everybody's responsibility. And just like company culture as a whole, an ethos of safety starts at the top.

As VP of Safety & Team Development for the Buesing Corporation, Brian Owens oversees all the safety programs for the company and speaks publicly on safety topics. He's even written a book called *Inversion and the Perspective-Based Safety Culture*.

His focus on safety started in the military, and reached new heights when he entered the mining industry after leaving active duty. While undergoing the MSHA training required for mining, the president of operations shared that only two days earlier, an employee had been killed on the job.

"It never occurred to me that I could still get hurt or even killed at work, just doing a regular job. I thought all that was in my rearview mirror. Now that I was home [from Baghdad], nobody was shooting at me anymore," Brian said. "Watching this man break down openly and sob in front of all of us that hit me so hard that it actually launched my career into safety. That was the turning point for me."

Today, he is always in the pursuit of "zero incidents" when it comes to safety. Accidents will always happen, of course. But when a company prioritizes safety at every level, it can make a big difference.

Many small survey companies tend to fly by the seat of their pants in the quest to pay bills. Many of them are working as quickly as they can, and don't even have safety policies in place.

Brian says that type of work environment puts you at risk.

"We're not even talking safety. We're talking safety being the by-product of investing in your company culture, and you don't even need a safety person to do that. You need leadership, you need the buy-in from management and ownership and the core group of the company to set the tone. The trickle-down effect is improved safety," said Brian.

To reiterate: you do not need a safety department or a safety manager to prioritize safety. Yes, that person can help pave the way. But as mentioned previously, culture starts higher up than any one individual.

"As far as companies that simply don't have the budget or the manpower to put a pedigreed safety professional in those roles, that's not even what we're talking about. The leaders in your organization are torchbearers of culture," Brian said. "It can become safety-related, but we're way upstream from safety."

### ***Safety cannot be reactive***

If you only make one mindset change when it comes to safety, Brian said it should be this: take a proactive approach, rather than a reactive one.

Many companies operate by looking around for things that are already wrong or hazardous and then fixing them.

But when you take that route, sometimes you're already too late.

Brian offered this analogy of seeking out the root causes of unsafe situations:

"Let's use the analogy of a farmer walking through an orchard and looking for trees that are not putting off fruit. What most companies do is they walk through and look at things that are not going well, the things that are dangerous, and point at it and say 'that's going to cause an incident,' or 'that's why that incident got caused.' It is very reactive. My question is, what is happening to cause that tree to put off



bad fruit? To me, you need to get into the root. What is it that is not allowing that tree to be optimal in its production?”

This is where Brian’s concept of the inverted safety pyramid was born.

The concept was first inspired during a safety meeting at the mining company he worked at. The safety manager at the time was using a pyramid example during a meeting, with examples of fatal and catastrophic recent safety issues at the top. His plan was to use those incidents as scare tactics to get employees to be safer.

“I couldn’t help but feel that was way too late in the game, that we were missing valuable opportunities earlier in the process to be more proactive. And that is what created the idea behind inversion,” said Brian.

The inverted safety pyramid literally puts the old pyramid on its head in the quest to get ever-closer to zero safety incidents.

Brian doesn’t act like a safety policeman and use scare tactics. Instead, he works as a companion and peer alongside employees, helping them to recognize how to make smart choices.

“I just look for opportunities for improvement. And I come in underhandedly. Hey, what do you think about this? And then we have an educated conversation about it,” Brian said.

He also solicits employees’ advice. As part of Buesing’s continuous improvement team, he gathers employees from every corner of the company to brainstorm ways to improve the company—both in terms of safety and other matters.

A key finding was the employees actually wanted more safety trainings and refreshers on topics like fall protection and working in confined spaces.

“If you’re using safety to punish and oppress the workforce, that doesn’t do anything for you. If you’re using it the other way, to help create policy change and actually make things easier for them and safer for them and they see you as an advocate, that’s what you need,” Brian said.

### *Why it’s not enough to be compliant*



While some companies gloss over safety altogether, others consider it but simply think of it as a box to be checked off a list.

That’s where the key different between safety and compliance comes in.

“They’re two different things. Yes, they play in the same arena. But there are things you have to be compliant with for insurance reasons or OSHA or regulatory agencies. But that doesn’t necessarily have anything to do with safety,” Brian said.

He’s seen compliant companies that have terrible safety records, and companies that are nowhere near compliant that have fantastic safety records.

Checking a box leads to safety concepts that go in one ear and out the other, without sticking around in a meaningful way.

Picture a dartboard, Brian says.

“If you take a look at a dartboard you’ve thrown darts at before, have you ever missed the wall or missed the target completely and hit the wall? Yes. Okay. So it’s never what you intended. It was just a bad day. If you compare that dartboard to a business model, a lot of companies operate by trying to just stay on the dartboard—remain compliant. You hit the dartboard somewhere. Our approach is that the bullseye is the only acceptable approach. That is our target, period. We simply do not tolerate any deviation from a bullseye effort every single time. Does that guarantee that we are going to hit the bullseye every time? No. But on our bad days, we still wind up on the board.”

Compliance and safety are often conflated, but compliance is really just the bare minimum. If you really want to be safe, you need safety to be a cultural value of your company.

It comes down to teaching employees how to bake in safe practices to routine tasks, so that they become second nature.

### *The importance of onboarding*

When it comes to both safety culture and company culture as a whole, there is one key period that has a big impact: the employee onboarding process.

This is where you have an opportunity to make your company culture and values clear from day one.



In his current role at Alston Construction, Mike says he brings in the CEO to talk about the company culture in his own words during every new employee orientation. He thinks this top-down approach is a missing ingredient in many companies.

Alston is also very clear about setting expectations for employee behavior when it comes to things like speedy client communication and problem-solving on the job site.

Here's one example from Mike:

"Say you're on a project out in the field and there's a big problem. This is a major thing, we've got a big goof-up. How do the people in the field respond to that? Do they cower away in the corner and go, we got to figure out who to blame this on?" asks Mike. "That's one way. The other way is, let's get everybody together and figure out how to solve this thing. And then let's bring in the architect, the surveyor, everybody. Let's bring them together and go look, we got a big problem. Let's figure this shit out. And then let's take a solution to the owner as quickly as we possibly can. Those are two very real things that happen a lot. So that story we tell, we don't want to be [scenario] A. We want to be B."

At the end of the day, Mike said that most problems are the product of poor decisions, and successes are the product of good decisions.

Since you can't constantly look over your employees' shoulders, you have to trust them. And that means giving them the vision and training they need to make the right calls.

"The construction business is tough," Mike said. "We can have people at the entry-level of the company make a five-minute decision that can cost you millions of dollars. And that's a scary thing that some people just can't get their mind wrapped around. And so having those things in place and having them understand how to make those decisions is hugely important."

Brian agrees that hiring and onboarding are critical to instilling the right behaviors.

A new hire may have a perfect resume, but you also must consider the pre-existing behaviors that they have picked up earlier in their career.

Sometimes in addition to teaching the behaviors you want to see, you may have to help people un-learn previous behaviors.

"I compare employees coming through the door to an arrow mid-flight. They've already been launched from other things, and you didn't have anything to do with that. They came in that way. They were on a course that was already established long before they got there. But what I suggest is just a gust of wind can change the direction of an arrow mid-flight," said Brian.

"If you set that tone hard day one, what happens beyond that point is they actually toe the line much harder than if you just let them be who they were when they walked in."

The right training can help mold behavior, which in turn shapes your company culture for the better.

Why culture and safety are a long game

Part of the reason why a good company culture is so difficult to focus on and attain is because it takes time to see the results of your effort. It's also a never-ending process.

"I think the reason companies don't focus on it as much is because this is a long game. Culture is not six months. It's not a year. It's years. And you're never really there. Culture is somewhat aspirational," said Mike. "A lot of the people that run companies now, they're so short-term focused that they just forget about it and they don't pay any attention to it. It drives me nuts actually. But it's a long game. I'm such a firm believer in that as a strategic advantage."

No matter what size your company is, that investment is worthwhile.

"It doesn't matter the size of the company," Brian said. "You have those pre-established behaviors that are coming through your door. And if you're not doing something formal about ensuring that it is changed or embraced the way it is, then you're really just leaving it up to chance."

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While culture is always important, there's no doubt that it becomes even more vital the bigger your company is. At The Weitz Company's height, Mike said that they had about 600 employees.

"That's where I learned that culture's so important. And I don't know if it eats strategy for breakfast, but you can't do anything without, it that much I know. You have to work on it. You can't just not talk about it," he said.

At that scale, it's often helpful to create a formalize culture roadmap that verbalizes where you want your culture to go.

If you're lucky enough to already have a great culture, then the process becomes about upkeep more than creating from scratch.

"Weitz had a great culture anyway, so we weren't really changing it. We were just improving it and making it what we wanted it to be, because we had to work there. So we want to create the place we want to work," said Mike.

Culture and safety may start at the top, but it's a team effort through and through.

"I think it's really important to make sure that you're listening to what we would call the little guy. Nobody's saying that the best ideas are coming from the top," said Brian.

"There's nothing anywhere saying that the best ideas are coming from people with fancy letters after their name or pieces of paper framed on the wall. Some of the best ideas that I've come across that really stopped me in my tracks that really made me pause came from just your ground level employee. And you have to find a formal way to recognize that and give them a voice."

When every employee is working from the same instruction manual when it comes to culture, you'll have a healthy foundation for safety, happiness, and growth.





# The Need for Diversity in Surveying

*Prepared by Trent J. Keenan, PLS & Kristina Poulter*

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## ***Opportunity. Inclusion. Potential.***

These are just a few inspiring words that can sum up the benefits of diversity in the workplace.

Surveying has long been the domain of white men. But there are many other voices that are interested in having a seat at the surveying table.

Diversity is more than just an office that's made up of half men and half women. It's about cultivating talent across the social spectrum.

Anna, Hasmitha, Roxanne, and David are four surveyors who are proud to represent diversity in surveying. On a recent episode of the Geoholics Podcast, they teamed up to discuss the importance of prioritizing diversity in the surveying profession today.



## ***Diverse surveying voices***

Anna Rios is an RPLS and president Aerios Geo LLC in Georgetown, Texas. She's been in the surveying profession for nearly 20 years.

Hasmitha Rayasam was born in India and moved to the US to obtain her master's degree from Boston University in remote sensing and geospatial science. Hasmitha is a Project Scientist for Satelitytics, in Perrysburg, Ohio.

Roxanne Nimmer is a professional survey and is currently semi-retired. She was the fourth native New Mexican female to be registered in the state. Surveying since the 1980s, she's seen much negativity and injustice through the years—but sees room for hope today.

David Acosta, also of New Mexico, is part-owner of a survey company called Construction Survey Technologies, Inc. (CSTi).

Each of the four surveyors identifies with a diverse group, such as female, Hispanic, Indian, or multiple labels. And each one believes in the positive power of further promoting diversity across the profession.

## ***The power of diverse perspectives***

Diversity isn't just a checkbox or a buzzword. It's an asset.

The more diverse perspectives that your company can offer, the better work you can do, and the more effectively you can complete complex projects and serve a diverse set of clients.

When a profession or a company is not diverse, it's the equivalent of not seizing its full potential.

"If we don't become diverse, we're just really bottle-necking who we are and also the path that somebody could take coming in," David said. "If we don't diversify, then we're just really pinching ourselves down to only being able to do specific things by specific people."

He recalled attending a meeting a year or so ago in Orlando for the NSPs chapter. Looking around the room, he quickly realized he

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was one of the few Latinos in the group.

It was a wake-up call to the important fact that when you don't see your image reflected in existing leadership, you feel like you don't have a viable pathway to success. And that's demoralizing.

Diverse leadership is important because the citizens of today are global citizens, and surveyors play an important role in land development, city planning, and landscaping.

"If all those spaces we live in are being studied and planned by men, it is obviously being designed for men," Hasmitha said.

She recalled seeing a picture of a woman with a baby stroller not being able to use a sidewalk under a flyover, because the stroller didn't fit in there. "She had to walk on the road, which also had cars passing by at really high speed," Hasmitha said.

A more diverse and inclusive approach would have taken a mother's experience into account, and perhaps lent to a more inclusive sidewalk design with the ramp.

According to Anna, diversity comes back to the idea of creating opportunity: most specifically, the opportunity to increase the stagnating surveying workforce.

"There's opportunity with diversity to bring new fresh ideas, new perspectives, creativity, open dialogue, solutions to all kinds of problems," Anna said. "When people with different backgrounds work together, they each bring their own experiences to the table and that can bring great value and opportunity to the profession."

We all know that we need more surveyors. It's possible that the profession can gain a lot of that missing workforce simply by reaching out to some of the underrepresented groups that may not have been introduced to surveying in the past.

### ***Overcoming gender stereotypes***

Diversity encompasses more than gender, but gender stereotypes are a big elephant in the room.

It's easy to assume that rampant gender stereotypes are a thing of the past, but that's simply not true.

In Arizona, less than 5% of registered surveyors are women.

Geoholics host Kent Groh recalled an episode of the podcast where two Arizona female surveyors were interviewed.

One of the women shared a recent phone call she took from a male caller. He said that he wanted to talk to the registered professional surveyor. She said: that's me. The man didn't believe her.

When Roxanne started surveying several decades ago, the field was almost purely made up of "grumpy old white men."

"It was a big struggle to try to get licensed. It was constantly having to prove myself. Pay differentials were huge between myself and a male just starting out. Back then, it's like, what can you do? There wasn't a lot of pathways. You either had a job, or you didn't."

Today it's progressively getting better, but Roxanne thinks it's still not where it needs to be.

Hasmitha has also experienced stereotyping firsthand. While studying geomatics and petroleum engineering in college, she was essentially told that field jobs were for men.

"We had a lot of oil and gas companies come in looking for geologists or field engineers. And they would just say, 'yeah, we're looking to hire five men to work on the rig.' It was just taken as a fact that women wouldn't be interested in this drilling opportunity or geologist opportunity," she said.

Hasmitha knew that a desk job wasn't her only option. But she felt like she had to fight for the opportunities that landed at the feet of the men around her.

In Anna's home base of Texas, only 3% of surveyors are female. In the past 20 years, only 15 new Texan women have been licensed.

Anna was supremely lucky in that the first person she worked for when she became a surveyor was the very first woman surveyor ever licensed in the state of Texas. It gave her the role model and inspiration she needed to keep going.

“That’s where I got my inspiration. So I think when it comes to stereotypes, it’s very important to create that visibility. Because I saw her as a surveyor. And because I saw her, I felt maybe this is something I can do,” Anna said.

“It’s important to realize how you treat people impacts whether or not they stick around in the career in surveying. We really can’t afford to lose anybody,” Anna said. “So if there’s a woman that’s working in the field, we need to be supportive and encouraging, and we need to understand their background and their differences and support that.”

### *Diversity starts with leadership*



If diversity inroads are going to happen in surveying, it’s important that diversity is promoted from the top down.

Transformative change needs to begin with leadership. It will require changes in company culture, education, and accountability.

“If the leaders of the company are not following what they say and not implementing their goals and their values for the culture of their company, then they’re going to run into problems,” Anna said.

In surveying, it’s all too easy to have a disconnect between the office and the field.

When disagreements often get hashed out in the field and away from view, it’s hard to know what’s happening. That’s why it can be helpful to have education surrounding diversity and inclusion.

“It’s important to educate people that there are certain things that it’s not helpful to say. And I think a lot of it is when you bring people with different backgrounds, sometimes individuals don’t know what to say or how to say it. They say the wrong things and they hurt others feelings, or they make them feel less because they’re different. But that individual may not know what they’re saying is hurtful,” Anna said.

When dialogue is kept open between employees, it can help keep a safe and inclusive company culture alive.

“If you’re looking at a top-down approach, I do believe that the leaders of a company need to actively concentrate on inclusivity at each step, like for making space for women,” Hasmitha said.

This starts at the hiring process and continues through to the experience that women and minorities have once they are officially hired.

“I’ve been fortunate enough to work with a lot of different people from all over the world throughout my career. And you have to take into account that what you know and what they know are two different things,” Roxanne said.

It all boils down to the importance of communication and working in harmony with coworkers up and down the chain of command.

There have to be communication lines open in both directions: from the top-down, and also from the bottom up.

### *The importance of outreach*

If we’re going to achieve the goal of a more diverse and inclusive profession going forward, then we need to wrap that goal into our outreach efforts.

Anna is currently busy organizing the Woman’s Surveyor Summit, while David is the NSPS diversity committee chair.

There is lots of positive movement and energy already happening within the surveying world. The challenge now is to keep that momentum moving forward.

David believes that the key lies in enhanced outreach to kids and teens.



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“I’ve done a lot of outreach over the last two years from middle schools, high schools, colleges STEM nights, things of that nature. It’s just a matter of getting out there and promoting surveying,” he said. “It’s a little intimidating sometimes to get started. But we just have to do it.”

He described a recent middle school STEM event that he attended, where he noticed one of the parents eyeing his display table full of drones.

“He came over to talk to me, and it turns out he was wanting to get into surveying. He was already working for a surveying outfit, but he was wanting to pursue it more. So, I was able to have a talk with him and get him to go sign up for some classes. So you never know who you’re going to inspire,” David said.

Even if you’re talking to a roomful of girls and women, the outreach is worth it. Is it any different than talking to a roomful of boy scouts? In both cases, it’s likely that zero children in the room know what a surveyor is and what you do, until you tell them.

Hasmitha added that it would be helpful to reach out to university student groups that are already busy focusing on diversity. She currently is part of an organization called Graduate Women in Science and Engineering, which works to organize networking and outreach events on campus for undergrads and grad students.

“We invite professionals from the field to come and talk to us and help us learn. And I feel that if companies and women in leadership positions also actively reach out to us through maybe local universities or on LinkedIn, we could make this a two-way approach and increase diversity in STEM,” she said.

She also joked that if you want to gather a crowd, just organize an event that advertises free food.

All jokes aside, what’s clear is that it’s difficult for a profession to resonate with you when you feel like you’re the only diverse person in the room.

Actively seeking out diversity, fostering inclusive workplaces, and conducting strategic outreach events should be on every surveying professional’s radar.



# The Geoholics Host Bios

PARENTAL  
ADVISORY  
EXPLICIT CONTENT



## Kent Groh, LS

Jay is a professional land surveyor with 50+ years of experience and is the owner of Professional Land Consultants, Inc., Semi-retired. Kent's passion, besides podcasting and the Chicago Cubs, is creating a solid and sustainable foundation for the surveying profession that future generations can build on for years to come. He has been working as a land surveyor for over 30 years and believes in collaborating with the various geomatics professions and governing bodies to collectively enhance the respective occupations. Kent enjoys golfing, fishing, craft beer, good food & traveling with his amazing wife. He also knows EQ Kimball and is a future curling Olympic gold medal winner.

## Ryan Kelly, CP

Ryan's passion, besides podcasting and the New York Mets, is building lasting personal and professional relationships by providing the absolute best customer service and highest quality geospatial products available. He actively promotes all professions within the geomatics industry by working with students in both local middle and high schools, our future generation. Outside of work, Ryan's greatest joy is exploring the world with his amazing wife and beautiful son. He also attempts to play golf.

## Connor O'Gorman

The new kid on the block who's guilty pleasure is Justin Bieber. Connor's passion is all things Buffalo Bills and financial literacy education. He is a self proclaimed hack golfer, gambler and an amazing dog dad to his golden retriever. Connor is a University of Arizona graduate...GO CATS...and a merger & acquisition specialist. Side note...he's not the best reader.

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# About the Author

## Trent Keenan, PLS, WRS, CFedS.



Trent Keenan, PLS, WRS, CFedS. Trent's surveying career started when he was 19 and now spans over twenty-five (27) years, including ten (10) years in the public sector working for a large utility company, and fifteen (17) years in the private sector, with 14 of the 17 years being the President / Founder of Diamondback Land Surveying. He has served through all officers positions of both the Southern Chapter and State Association of NALS (Nevada Association of Land Surveyors), received the Meritorious Service Award for NALS in 2013, and was honored as the NALS Surveyor of the Year (2015) as well as receiving the Von Schimt Award for 2021. He is a past- President of NALS (2015), Current, Editor of The Nevada Traverse Publication (NALS), Current Secretary/

Treasurer for the WestFed (The Western Federation of Professional Surveyors ) Board and current Director from NALS, Current Treasurer on The Nevada Land Surveyors Education Foundation Board (NLSEF), Current Vice President on the Southern Nevada Chapter of the NALS, Moderator/ Facilitator/ Founder of Mentoring Mondays & Wisdom Wednesdays for the Land Surveying Profession, and a proud sponsor and brand ambassador for Get Kids Into Survey (GKiS). He is currently licensed in 5 Western States (Arizona, California, Nevada, Utah & Washington). He is also a Certified Federal Surveyor and a Nevada Water Rights Surveyor. He has been an active board member in NALS since 2007 and a regular member since 1997.



The logo for "Mentoring Mondays" features the word "Mentoring" in a black, cursive script font. To its right is a small black icon of a surveying tripod. Below these elements, the word "MONDAYS" is written in a large, bold, black, distressed sans-serif font. The letters of "MONDAYS" have a white, splattered texture, and the letter "O" contains a red and white circular design.