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VOLUME LVIII

Spring 2023

ISSUE II



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**Editor: Kay McDonald**

**The Montana Association of Registered Land Surveyors** is a statewide organization of professional land surveyors licensed to execute land surveys in the state of Montana and dedicated to improving the quality of professional land surveying and land records in the state of Montana. MARLS motto is:

**“WE MEASURE UP”**

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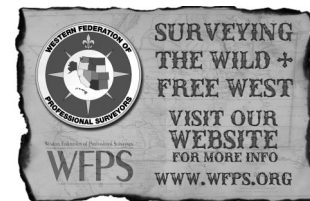
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## President's Message Christopher W. Kosine, PLS



Fellow Members,

Spring has definitely sprung around the Treasure State! As we start to get busy, I want to take a moment to remind members to be safe out there while working under the Big Sky. There are more dangerous professions, however we still have plenty of things to watch for. Things like slips trips and falls. Critters from tiny ticks, to snakes, to hungry Grizzlies. Heat, sun and long days. Just to mention a few of the dangers we deal with daily.

Trig-Star is well underway. I want to thank everyone that has volunteered their time this year and years past. For anyone that doesn't know what Trig-Star is, it's a competition for high schoolers that recognizes and rewards students that excel in math. It's sponsored by NSPS. The goal of the program is to show students practical uses for math and make them aware of the surveying profession. I highly encourage you to take a few hours out of your schedule in the spring to volunteer. This is one of the only ways high schoolers get to see what surveyors do and it's just before they graduate. In a way, the profession of surveying relies on your time and effort to talk to the next generation. I would like to think if a surveyor had talked to me in high school it would have saved me a few years of drifting through college before figuring out I wanted to be a surveyor.

I wish everyone a safe and profitable survey season. Like the song from the 90's says...remember to wear your sunscreen.

Sincerely,

Christopher W. Kosine, PLS

MARLS President

**MARLS website [www.marls.com](http://www.marls.com)  
MARLS members sign in today!**

MARLS members ~ We encourage you to sign into the MARLS members only site to keep you up to date with MARLS information, participation of our MARLS members' discussion board, legislation, meetings, reports and many more currents news and announcements.

We also encourage you to use the MARLS discussion forum to let us know if you have ideas, comments or just want to chat.

Contact Kay at [kay@marls.com](mailto:kay@marls.com) if you need help signing into the members side of the MARLS website.

### About the cover...

**Artwork by  
James A. Flansburg, PLS**

Contact Mrs. James Flansburg if you are interested in Jim's artwork. His artwork has been the cover of the Treasure State Surveyor for over 33 years.

He specialized in bronzes, ink sketches and watercolors. He inserted in all his pictures a surveyors marker which are fun to find.

*Mrs. James A. Flansburg  
3495 Cathy Court, Missoula, MT 59803  
Phone: 406-543-6835*

*The artist reserves all rights on the cover.*

## **MONTANA ASSOCIATION OF REGISTERED LAND SURVEYORS MISSION STATEMENT**

**PREAMBLE:**

The true merit of a profession is determined by the value of its services to society. Therefore, the Montana Association of Registered Land Surveyors does dedicate itself to the promotion and the betterment of the profession of land surveying as a social and economic element vital to the welfare of society.

The objectives of the association are:

- ◆ To promote the common good and welfare of its members and the public in the profession of land surveying.
- ◆ To advance the study of land surveying and the education of land surveyors.
- ◆ To promote public knowledge, faith, and reliance in licensed professional land surveyors and their work.
- ◆ To foster and maintain high standards of professional ethics in the practice of land surveying.
- ◆ To foster and support legislation generally beneficial to the profession and to the citizens of the state of Montana.
- ◆ To promote closer relations, understanding, and cooperation within the profession.
- ◆ To establish better relations between the land surveyor and other professions interested in land surveying.
- ◆ To aid and encourage the interest of associate and student members of the association.

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#### **Surveying Scholarships and Surveyors Assistance Fund Information**

The MARLS Scholarship Foundation, Inc. (MSF) consists of two funds being the MSF Scholarship Fund and the MSF Surveyor's Assistance Fund. MSF Scholarship applications available at [www.marls.com](http://www.marls.com).

The MSF Scholarship Fund awards scholarships to first and second year land surveying students and also the National Trig-Star Program for high school students. The MSF Surveyor's Assistance Fund is intended to help surveyors with financial assistance. Should you know of a MARLS member with a financial need or crisis, please discuss at the chapter level and forward your recommendation to MSF President Bill Weikel or Kay. The MSF Board of Directors will take the recommendation into consideration.

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### **For Sale by Rich Jensen PLS Oak stamping block/anvil for Aluminum Survey Cap**

Rich Jensen has stamping blocks for sale and below is information on ordering them. I have also attached information with picture for you to order one – Order info below.

#### **Oak stamping block/anvil for Aluminum Survey Cap**

The oak block is designed to accept aluminum survey caps having a nominal stem diameter of 1-1/4" or less and the cap may be inserted from either side of the block. Caps having a top diameter of 2-1/2" or less may be stamped at any point on the cap and it will be supported. For caps having a top diameter larger than 2-1/2", it is recommended the stamping take place only where the cap is supported by the block.

The block has a single coat of tung oil finish to help preserve the wood and should last for years. Paste wax or tung oil applied to each end of the block each spring (at least once a year) will help preserve the block for a longer time. After time the surface of the block may become splintered from constant impacts, when this happens either replace the block or sand it down to remove the splinters. The oak splinters will pierce the hand easily if care is not taken.

Blocks may be ordered at [rj406orig@fmc.com](mailto:rj406orig@fmc.com), larger size blocks are available and a price will be quoted at the time of the order. The quoted price of each block purchased will be billed to you.

Rich Jensen, PLS

**Single block: \$25.00 each**  
**3 or more blocks: \$20.00 each**



# What is Passive Control and Why is it Important?

By: Brian Shaw, NGS

Passive Control has been instrumental to the mission and success of the National Oceanic and Atmospheric Administration's (NOAA) National Geodetic Survey (NGS) throughout its history, which dates back to 1807 when Thomas Jefferson created the Survey of the Coast. Prior to the creation of NOAA in 1970, NGS's predecessor agency was the United States Coast and Geodetic Survey (USC&GS). USC&GS had been the office's name for almost 100 years and many of the survey marks you will find throughout the United States and its territories have USC&GS stamped on them. These marks were established primarily for horizontal and vertical positioning, and the survey observations between them were used to help determine both the datums of the past, and the datums we still use today. For over a century these marks in the ground have formed the foundation of the National Spatial Reference System (NSRS), a consistent coordinate system that defines latitude, longitude, height, scale, gravity, orientation, and shoreline throughout the United States. Passive control and the datums derived from them are truly the infrastructure of our nation's infrastructure. Highways, railroads, bridges and more rely on these marks in the ground and the surveys performed using them. While today we rely more heavily on the GNSS "stars" in the sky for positioning, these marks in the ground will continue to be important and should be perpetuated whenever possible.

Passive control is a term applied to survey marks that are "permanently" monumented and infrequently surveyed, whereas the term active control was developed for Continuously Operating Reference Stations (CORS), as well as other geodetic techniques that are constantly collecting data. Passive control includes brass marks in the ground, 3-D deep driven rod marks, and many other types of monuments that were established to weather time and the elements, providing a location for surveyors to use to access the geodetic datum. The Geodetic Glossary<sup>1</sup> has a number of definitions that can be used for passive control, and one definition is **control point**: "A point to which coordinates have been assigned; these coordinates are then used in other (dependent) surveys." There are many synonyms for passive control including control point, geodetic control, monument, station, mark, survey mark, bench mark and many more. In the past, some of the different terms were originally intended for use with specific types of control – for instance bench mark was used for marks with a precisely determined height, also known as vertical control – but today most of these terms have become generalized as a term applied to all survey marks.

For over 200 years NGS has spent a considerable amount of money and effort establishing control across the United States and territories. This was done primarily to determine precise coordinates (positions and heights) by performing extensive surveys across all states and territories, and sometimes even surveying in other countries. The Survey of the Coast originally established control and performed surveys to determine coordinates for locations on shore as well as offshore. These

surveys determined where places were on land, but also mapped offshore obstructions – such as sea mounts, rocks and sand bars – to develop accurate nautical charts in support of safer navigation. As our country grew and the surveys spread across our growing nation, this control was used to determine national datums for positioning, ensuring our nation had a consistent coordinate system for all to use.

The growth of our national network can be seen in maps of the survey control networks below and by looking at the total station counts in the table and chart below. In 1901 the US Coast and Geodetic Survey released the first major nation-wide datum adjustment called the United States Standard Datum of 1900 (USSD), which included coordinates on 5,000 control stations. Surveying increased and the network greatly expanded so when the North American Datum of 1927 (NAD 27) was released there were 25,000 control stations. Just after NAD 27 was realized our nation fell into the Great Depression. As part of Franklin D. Roosevelt's New Deal, the Works Progress Administration (WPA) and other similar programs helped the USC&GS hire unemployed surveyors and engineers. These programs enabled the USC&GS to perform more surveys across the nation, significantly helping to develop the geodetic infrastructure and datums we have today. You can see this major increase in the chart below that shows the dates that marks were first established in the NGS database. The 1930s were by far the most productive decade for establishing new control across our nation from ~18,000 new marks in the 1920's to ~144,000 new marks in the 1930s, an eight fold increase. By the time the North American Datum of 1983 (NAD 83) was established there were 272,000 stations included in the datum adjustment, making it the largest mathematical equation ever solved at the time.<sup>2</sup>

Year	Datum	Stations
1901	U.S. Standard Datum	5,000
1927	North American Datum of 1927	25,000
1983	North American Datum of 1983	272,000

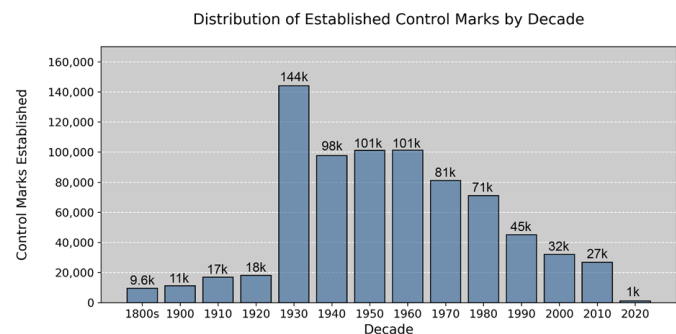


Chart 1 - Distribution of Control Marks Established by Decade.



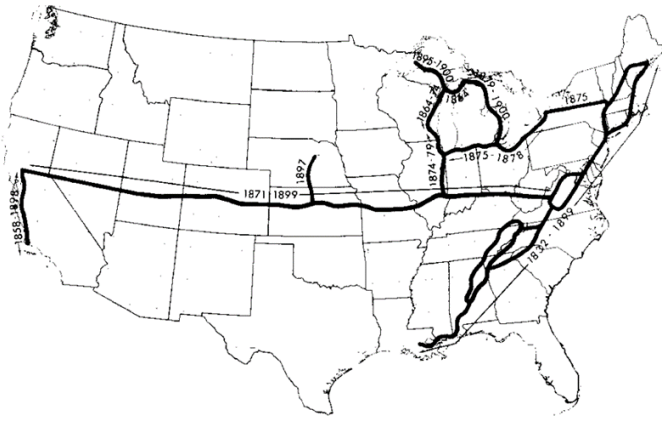


Figure 1 - U.S. Horizontal Control Network in 1900 (Figure 4.1 NOAA Professional Paper NOS 2)<sup>2</sup>



Figure 4.2. U.S. horizontal control network in 1927.

Figure 2 -U.S. Horizontal Control Network in 1927 (Figure 4.2 NOAA Professional Paper NOS 2)<sup>2</sup>

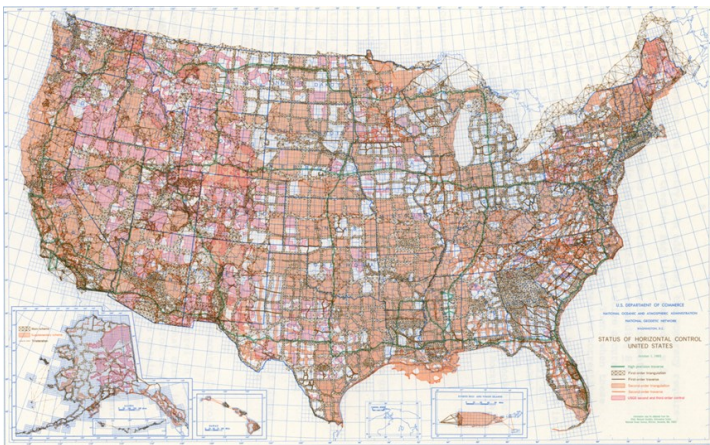


Figure 3 - Status of Horizontal Control United States in 1983<sup>3</sup>

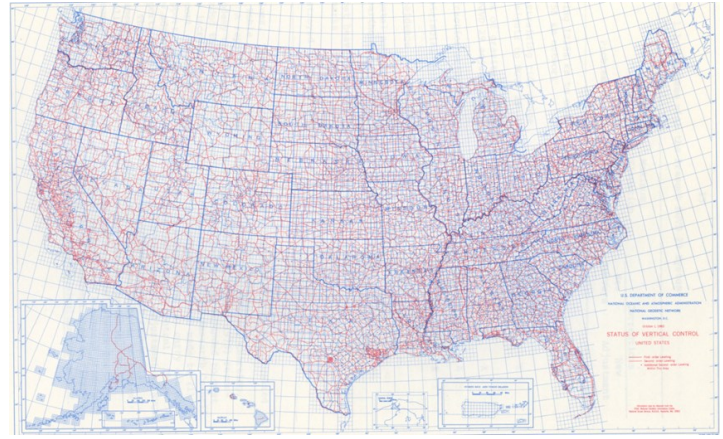


Figure 4 - Status of Vertical Control United States in 1983<sup>4</sup>

As you can see by the progression of the maps above, there was a tremendous amount of surveying accomplished between NAD 27 and NAD 83. This included surveying the 272,000 horizontal stations used in the NAD 83 adjustment<sup>2</sup> and 505,000 permanently monumented bench marks and 204,000 temporary bench marks with over 730,000 km of geodetic leveling for the North American Vertical Datum of 1988 (NAVD 88) adjustment.<sup>5</sup> The amount of people hours it took to accomplish this was a monumental feat. Horizontal survey crews set up Bilby Towers, climbed mountains and determined positions by measuring angles and distances. During the same time period, vertical survey crews walked hundreds of thousands of kilometers measuring accurate height differences between marks using leveling rods. Below are some historical photos of survey crews on Bilby Towers and performing geodetic leveling.



Photo 2:  
Leveling down the trail into Glen Canyon. Level party of Fred E. Joekel. Glen Canyon, Arizona. 1921.

Credit: C&GS Season's Report Joekel 1921.<sup>7</sup>

In Montana there is a high precision traverse coming North out of Wyoming through Billings and ending at another high precision traverse going East to West across the state. There is a decent amount of first order triangulation, particularly going in lines North to South in the eastern half of the state and along the US/Canada border. The first order leveling follows the major roadways and railways with second order leveling along smaller roadways.

Passive control has been very important in the past and will continue to be important in the future. Extensive amounts of effort and money have been put into developing these control networks that are the infrastructure for our nation's infrastructure. The National Geodetic Survey is no longer establishing monuments and surveying them across the country, but state departments of transportation and other agencies still utilize this control for accessing the National Spatial Reference System and determining new survey control. Performing repeat surveys enables organizations to monitor how control is moving over time and at what rates. Soon NGS will be modernizing the NSRS and the passive control will not define the new datums but it will still be important to perpetuate passive control allowing it to be used today and in the future. While it is inevitable that some of this control will be destroyed due to roads expanding, railroads being removed and more, it is important to educate the public on the importance and purpose of these monuments so they can continue to be used by surveyors today and into the future.

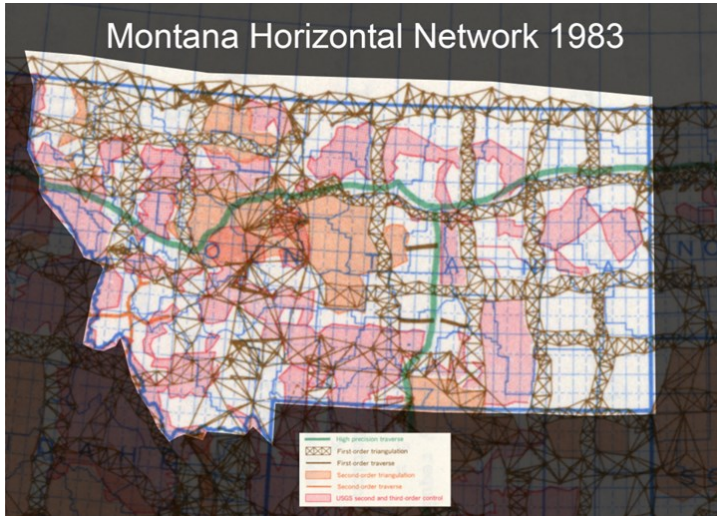


Figure 5 - Montana Horizontal Network 1983

<sup>1</sup> Geodetic Glossary. United States, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Charting and Geodetic Services, 1986. [https://repository.library.noaa.gov/view/noaa/2827/noaa\\_2827\\_DS1.pdf](https://repository.library.noaa.gov/view/noaa/2827/noaa_2827_DS1.pdf)

<sup>2</sup> Schwarz, Charles R.. North American Datum of 1983. United States, National Geodetic Survey, Charting and Geodetic Services, National Ocean Service, 1989.

[https://geodesy.noaa.gov/PUBS\\_LIB/NADof1983.pdf](https://geodesy.noaa.gov/PUBS_LIB/NADof1983.pdf)

<sup>3</sup> <https://geodesy.noaa.gov/INFO/history/network-surveying.shtml>

<sup>4</sup> <https://geodesy.noaa.gov/INFO/history/leveling-network.shtml>

<sup>5</sup> Zilkoski, D., Richards, J, Young, G.. Results of the General Adjustment of the North American Vertical Datum of 1988. Surveying and Land Information Systems: Journal of American Congress on Surveying and Mapping. United States, American Congress on Surveying and Mapping, Vol. 52, No. 3, 1992, pp. 133-149.

<https://geodesy.noaa.gov/library/pdfs/results-adjustment-navd-1988.pdf>

<sup>6</sup> <https://oceanservice.noaa.gov/geodesy/bilby-towers.html>

<sup>7</sup> <https://www.flickr.com/photos/noaaphotolib/5578048172/in/album-72157635334100609/>

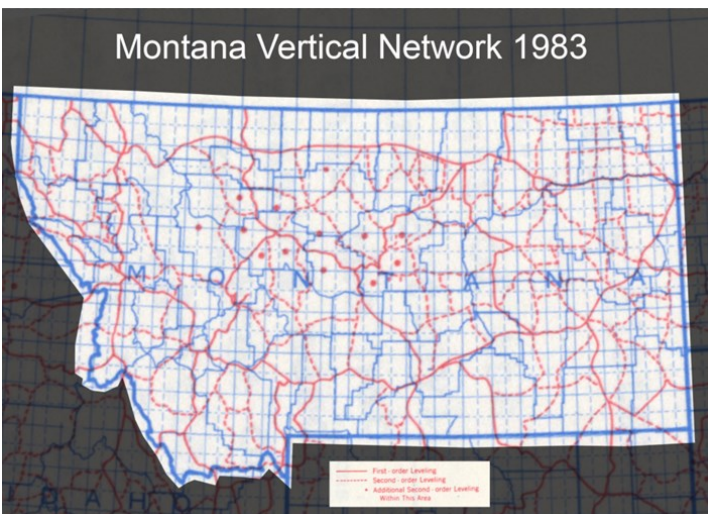


Figure 6 - Montana Vertical Network 1983

### MARLS INVITE TO OUR MEMBERS - BUSINESS CARD ADVERTISING

MARLS is inviting all our members a business size rate for you to advertise your firm on our newly developed page for our surveyors. We will be starting this page in the summer edition of the TSS which will go out in July 2023 for an annual rate of \$160 (\$40 per quarterly issue of the Treasure State Surveyor). We will send you an invoice annually every July 1st of each year to renew your ad. Send your business card request in jpg to Kay at [www.marls.com](http://www.marls.com). Thank you for your continued support of MARLS. See page 27 for more information and contact information.

# The Deprecation of the US Survey Foot

By: Steven J. Martin

*Editor's Note: This article will appear concurrently in American Surveyor Magazine and the Treasure State Surveyor.*

U.S. survey foot = 12/39.37 meter

International foot = 0.3048 meter

The difference between the two definitions is exactly 2ppm, or about 0.01' per mile.

Some of you know about the deprecation of the U.S. survey foot already, and some may be asking "What the heck is deprecation?" So let's start with a definition:

*"Deprecation is a term widely used in the field of legal metrology and other measurement science fields of study. It describes a decision to discontinue the use of a specific measurement unit or method of sale."*



**WHY FRET?** Stay informed on the status of the US survey foot.

The U.S. survey foot will fade away with the National Spatial Reference System (NSRS) Modernization including the roll-out of the State Plane Coordinate System of 2022 (SPCS2022). The National Institute of Standards and Technology (NIST) and the National Geodetic Survey (NGS) have taken action to make it so.

*"The intent of this action is to provide national uniformity of length measurement in an orderly fashion with minimum disruption, correcting a measurement dilemma that has persisted for over 60 years."* (85 FR 62698, Document number 2020-21902).

**SPRING 2023**

This deprecation should have already happened with the North American Datum of 1983 (NAD83) and SPCS 83, however change is hard. Do not fret though, SPCS 27 and SPCS 83 coordinates will not change, as legacy systems they will still be in terms of the U.S. survey foot, if they are currently defined that way (see graphic for U.S. survey foot jurisdictions). NGS recognizes that changing SPCS 27 or SPCS 83 coordinates would cause even more confusion than exists today. It is only going forward into SPCS2022, for states using U.S. survey foot in their SPCS, that users will need to change to the official conversion, commonly called the international foot, when converting from metric coordinates and in software settings.

To give some background on the issue: In 1893 the Mendenhall Order officially embraced the meter, abandoned the old British Imperial Yard, and defined the foot to be exactly 1 foot = 1200/3937 of a meter.

In 1959, a new definition of the foot was adopted, 1 yard = 0.9144 meter (FR 59-5442). However, there was an exception for the Coast & Geodetic Survey to continue using the old definition of 1 foot = 1200/3937 meter "until such a time as it becomes desirable and expedient to readjust the basic geodetic survey networks in the United States".

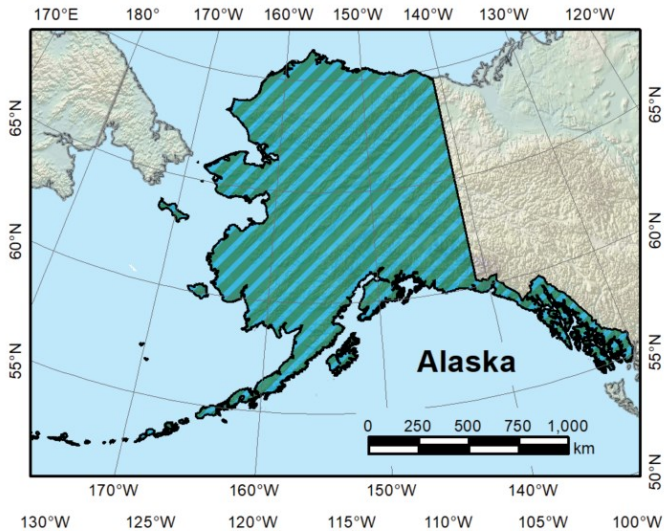
Despite the mandated change to the international foot in 1959, the surveying community in 40 jurisdictions elected to continue the U.S. survey foot when the national geodetic survey was readjusted in 1986. As mentioned above NIST and GSA were taken action to make complete the transition to the "international" foot definition effective December 31st

The difference between the old U.S. survey foot definition and the "international" foot definition may be subtle, but dealing with numbers in the millions of feet range such as the Plane Coordinates, this difference can be significant. I was used to practice in the Alameda County, CA service area of the East Bay Municipal Utility District (EBMUD), an agency that used the U.S. survey foot. A shift of approximately 12.9' would occur if the wrong definition was used in converting or reprojecting SPCS 83 coordinates to the international foot. Several issues were encountered when I started working at EBMUD, where CAD files obtained from outside agencies for reconstruction projects were used to design a water line. The files were converted to Microstation by drafting staff not knowing about the correct units settings to use. The issues only became apparent when we (the surveyors) went out to stakeout the new waterline (on short notice of the project). It takes some training and quality control along the way to avoid these conversion issues. The ultimate goal of having a single definition of the foot is to avoid these kinds of issues.

So, to sum up, the switch to the "international" foot definition for all SPCS2022 users will occur with the rollout of the Modernized NSRS and SPCS2022, now expected in 2025. This will not affect informed users of SPCS 83 or SPCS 27 for the current 40 jurisdictions officially recognized by NGS as using the U.S. survey foot definition. Mistakes do occasionally occur with users of SPCS 83 and SPCS 27 and education on the two definitions will help head those off. Education is even more important in advance of the planned 2025 rollout of SPCS2022.

*"Elimination of the U.S. survey foot after 2022 will reduce problems with having two versions of the foot in simultaneous*

*(Continued on page 13)*



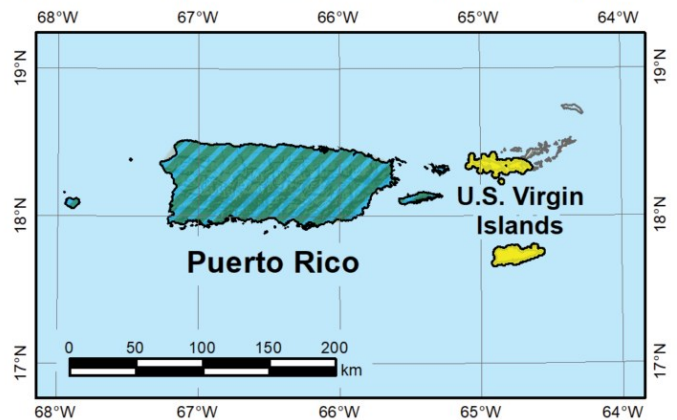
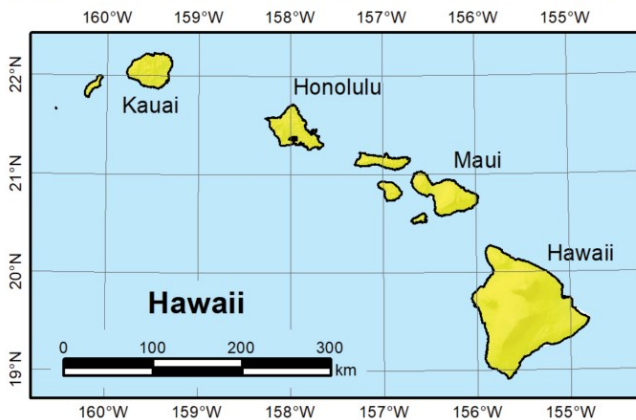
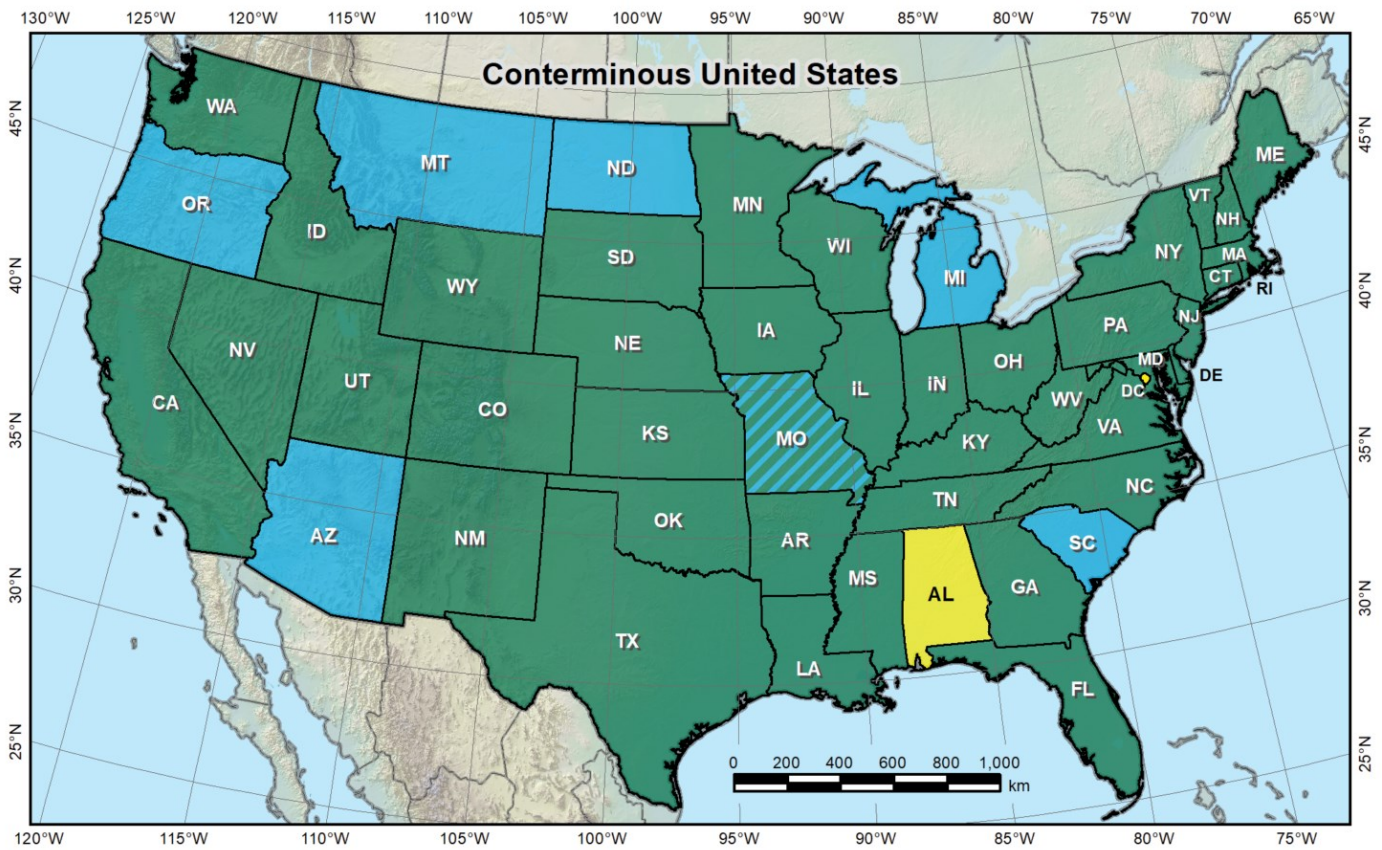
**State Plane Coordinate System of 1983**  
 Legislation and foot version adopted by U.S. states,  
 districts, territories, and commonwealths

**Total of 56 U.S. jurisdictions**

- SPCS 83 legislation, U.S. survey feet:  
40 jurisdictions
- SPCS 83 legislation, international feet:  
6 jurisdictions
- SPCS 83 legislation, foot type not specified:  
4 jurisdictions (3 shown)
- No SPCS 83 legislation or foot type specified:  
6 jurisdictions (4 shown)

**Three U.S. jurisdictions not shown**

- Guam: SPCS 83 legislation, foot type not specified
- American Samoa: No SPCS 83 legislation or foot type specified
- Northern Marianas: No SPCS 83 legislation or foot type specified



(Continued from page 11)  
use. In contrast, if both foot types were allowed after 2022, the problems (and costs) would never go away. Early on there may be confusion, errors, and costs associated with the change in the foot type, but these will diminish over time. Had this change been made in 1986 as originally intended, it would be only a distant faint memory by now. It further bears repeating that the change in foot type will occur in tandem with the 2022 NSRS modernization, and that it will be a very small part of the other changes happening after 2022.” ([nist.gov/pml/us-surveyfoot/frequently-asked-questions-faqs](https://nist.gov/pml/us-surveyfoot/frequently-asked-questions-faqs))

Article republished courtesy of California Surveyor Magazine

Steven J. Martin retired in January of 2021 as the top surveyor for the East Bay Municipal Utility District (EBMUD -Oakland, CA) with 34 years of service split between the County of San Diego, EBMUD, and the City of San Diego. He contributes to the NGS GPS on Benchmarks program in his spare time and writes occasionally.

#### Sidebar:

For more information:

See the recorded webinars on the NGS website—December 12, 2019 “Putting the Best Foot Forward: Ending the Era of the US Survey Foot” ([geodesy.noaa.gov/web/science\\_edu/webinar\\_series/ending-us-survey-foot.shtml](https://geodesy.noaa.gov/web/science_edu/webinar_series/ending-us-survey-foot.shtml)), and April 25, 2019 “Fate of the US Survey Foot after 2022: A Conversation with NGS” ([geodesy.noaa.gov/web/science\\_edu/webinar\\_series/fate-of-us-survey-foot.shtml](https://geodesy.noaa.gov/web/science_edu/webinar_series/fate-of-us-survey-foot.shtml)).

There are several presentations on the subject in the NGS Presentation Library ([geodesy.noaa.gov/web/science\\_edu/presentations\\_library/](https://geodesy.noaa.gov/web/science_edu/presentations_library/)), most recently “Retirement of the US Survey Foot” by Michael Dennis 5/5/2021.

NIST has a set of web pages on the U.S. survey foot at ([nist.gov/pml/us-surveyfoot](https://nist.gov/pml/us-surveyfoot)), including a Frequently Asked Questions page.

See also New York Times article “America Has Two Feet. It’s About to Lose One of Them”, published 8/18/2020 ([nytimes.com/2020/08/18/science/foot-surveying-metrology-dennis.html](https://nytimes.com/2020/08/18/science/foot-surveying-metrology-dennis.html)).



**2024 MARLS Conference**  
**March 20 - 22, 2024**  
**Copper King Hotel**  
**and Convention Center**  
**Butte, MT 59701**

## The Ballad of the Montana Surveyor Stewart Nash P.L.S. - TSS July 1988

I’ve toted the chain in the woods in the woods of Maine  
and I’ve hacked thru the brush in the west coast rain  
Turned a lot of angles in the New Mexico sun  
and cottonmouths of Louisiana can sure make you run  
But of all the places in this great land  
none will match diversities of old Montan  
If it’s prairies and flat lands that you do best  
or craggy old peaks that become your quest  
If it’s timber and downfall that makes you strain  
or the Missouri River breaks after the rain  
Or if the city lot survey is your favorite zone  
where a passerby can run over your cone  
Or a ten-thousand-acre ranch with their fences built high  
that run long and straight and disappear in the sky  
If it’s a hundred lot subdivision that drives you mad  
where governing authorities have labelled you - bad  
Or a two-acre tract by that mountain stream  
where a new land owner can fulfill his dream  
And an oil well, coal mine or a gold mine too  
needs to know if? How much? Where? And calls on you  
Or that record size sandstone set in the 1880’s  
that’s weathered and worn and now full of maybes  
For those very first surveys were sometime larks  
you’re sure it’s the one but where in heck are the marks  
Then there’s that broken U-joint on your 4-wheel drive  
back in the hills a good three-hour drive  
If you’re self employed your ingenuity takes hold  
wire up the drive shaft and away you go  
But if you’re on the payroll, that may be too hard  
just radio for help and deal out the cards  
If it’s that mule deer buck you see in your scope  
and as he chews on your back-sight, you lose all hope  
Or that proud old eagle as he flies through the air  
and glides in so close, you think – “He wouldn’t dare!”  
Her winters are cold and windy too  
an hour turning angles and your face is near blue  
But when the winter is over and the winds are still  
out pops the Crocus all over the hill  
What a sight to behold the wildflowers of spring  
and grassy hillsides that look velvet green  
The robins have returned and the ducks and geese  
and the sheep in the hills have lost their fleece  
Calves, colts and fawns are always seen  
and it’s fun snaring gophers with your plumb bob string  
All the rewards can’t be listed in this short poem  
but it doesn’t take long to call her home  
You’ll never know until you traveled through Big Sky land  
that there’s nothing like surveying in good old Montana.



❖ Reprinted from the July 1998 Treasure State Surveyor

## Just Say No

By: Dennis Mouland, PLS

“The first sign of maturity is the discovery that the volume knob also turns to the left.”

*“Smile” Zingers*

I was running my own surveying business in Flagstaff, Arizona. I was doing work for private clients, cities, even the Forest Service, and had recently completed a complex boundary survey for the National Park Service. They liked my work and trusted me.

I got a call from the Park Service one day and they asked me to put in a price on some topographic work up at Lake Powell. It was for the future Dangling Rope Marina. I absolutely love the southwest part of the country with all the amazing rock formations and other features. And Lake Powell is just an incredible place to be. I wanted to work up there so badly, so I threw them a price. It was a little lower than it should have been, but I wanted to work up there. It was accessible only by boat.

The next day I was told that the project was mine. It needed to be started rather quickly as some design firm was waiting on topo data the Park Service was supposed to provide. They never asked me if I was licensed in Utah (I was not), so I did not bring up the subject. Perhaps because it was just topo, they did not feel a PLS was required. I wanted to do this work!

But after a couple of days, I got to thinking about the other work I already had; clients expecting timely services. It was going to be difficult to take on this project and I would be away from my office for several days. It would tie up my employees and resources for a while. Finally, I called them back and told them I just could not perform the work in the time they requested.

But there were many times in my career where I did not do that; where I did not say “no” to the work. You probably know surveyors who would never ever say no. You always take on new work; you greatly over-extend yourself. The basic business principle being; never say no. It is easy to justify this. You can remember six months ago when you did not have enough work; you and your faithful employees were really suffering. So now, you need to make hay while the sun shines. But there is a real danger in over-extending yourself. At other times in my career, I ended up disappointing everyone I was working for because I was so overloaded.

It goes beyond the fact that you cannot perform for clients in a timely fashion. It goes beyond the fact that your personal life goes on hold when you are this busy. It is more a matter of “can you truly do the quality, professional work for which your clients are paying”?

I know surveyors who have never said no. They could never turn down work, no matter how big or small it was. No matter if the work was out of their areas of expertise, they could never say no. While it is nice to increase your market share of the

available work in your geographical area, it is also a good idea to let the profession as a whole serve its clients in a timely, quality way. It is an ethical question when we get over-extended. The real professional will recognize this situation and get out of it quickly.

I personally grow tired very quickly of someone who offers the whole world to me regarding quality or timeliness. Even buying a set of tires for my truck, I get annoyed when the work takes four hours when they promised it in two hours. I tend to not go back to businesses that have treated me that way. I quit flying a major airline because nine time out of ten, they were late in arriving.

When I called the Park Service back, they were very gracious. I thought they would be angry with me. But they were very understanding. In fact, they called me two days later to thank me for being so open and honest about my situation. They were grateful that I did not stick them with an untimely product and other contractual problems. So, I felt good about the experience....even though I missed out on surveying up at Lake Powell.

Surveyors: we all need to learn to say “no” sometimes.



## Fate of the U.S. Survey Foot after 2022: A Conversation with NGS

Dr. Michael Dennis, National Geodetic Survey

Having two feet is great for people, but not so good for standards. Since 1959, two definitions of the foot have been used in the U.S. One is the "international foot", adopted nationwide at that time. The other is the "U.S. survey foot", a renamed perpetuation of the 1893 definition that was intended as temporary. Although the U.S. survey foot is longer by only 2 parts per million (0.01 foot per mile), having both in use at the same time creates real problems with real costs. The result is decades of confusion and chaos in fields where large distances and coordinates are used, such as surveying and mapping. NGS missed an opportunity to fix this problem in 1986, with the change from the NAD 27 to NAD 83 datums. Another opportunity is in 2022 with the modernization of the National Spatial Reference System. This webinar reviews the history of the foot, discusses the vital importance of standards, and gives examples of problems created by having two feet. It shows how NGS can help move the U.S. toward a single, uniform definition of the foot to restore order from chaos.



## **2023 CFEDS PROGRAM PROMOTIONS**

### *STATE SURVEY SOCIETY INVITATION*

May 1st, 2023

Dear Executive Director,

The Certified Federal Surveyor (CFedS) program is an intensive course designed to equip licensed surveyors with an unsurpassed Public Land Survey System (PLSS) knowledge base. Created in 2005 by the Bureau of Land Management, CFedS has become the hallmark program for surveyors wishing to provide cadastral services on federal trust lands while deepening their understanding of working within the PLSS. The non-PLSS surveyor can also benefit from the program by becoming more well-rounded in the many intricacies of our profession.

In early 2022, we embarked on a mission to modernize the CFedS offering, bringing the program online for the first time. While this was no small undertaking, I'm proud to say that the core seven-course training series is now delivered via [www.cfeds.org](http://www.cfeds.org). Close to 75 individuals are working through the material as of this writing with another 520+ active professionals among our ranks.

As this initiative is important to both CFedS members and NSPS, we'd like to increase regional engagement via continuing education presentations with societies such as yours. We partnered on 9 such sessions in 2023 and are looking to expand this number in 2024. If you're able to consider a CFedS presentation within your 2024 conference, please touch base with me at the address below.

From a national perspective, the CFedS program hopes to get our message out in as many venues as possible. To make all surveyors aware of this educational opportunity, we've created a range of promotional materials for use within state society publications (full and half page options) + websites which are available at: [www.cfeds.org/media-resources/](http://www.cfeds.org/media-resources/)

It would be greatly appreciated if you could share these materials with your membership. Interested surveyors can visit our webpage at [www.cfeds.org](http://www.cfeds.org) or contact me directly at [glen.thurow@cfeds.org](mailto:glen.thurow@cfeds.org) to discuss further collaborations.

I appreciate your consideration of this request.

Glen W. Thurow, NM P.S., CFedS  
CFedS Training Coordinator

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[GLEN.THUROW@CFEDS.ORG](mailto:GLEN.THUROW@CFEDS.ORG) - PO BOX 91393, ALBUQUERQUE, NEW MEXICO 87199

The Certified Federal Surveyor (CFedS) program, founded 2005, is produced by the Bureau of Land Management (BLM) in conjunction with the National Society of Professional Surveyors (NSPS).



## 2023 Farm Bill: Broadband Mapping Reforms Enhancing Infrastructure Deployment

The National Society of Professional Surveyors (NSPS) respectfully urges the Rural Utilities Service (RUS), National Telecommunications and Information Administration (NTIA), and the Federal Communications Commission (FCC) to not repeat serious and costly mistakes made in Broadband Mapping since 2009. The awarding of contracts failed to place the proper, and legally required, emphasis on selection of contractors based on competence and qualifications. Rather than using the time-tested qualifications based selection (QBS) process codified in 40 U.S.C. 1101 et seq. (commonly known as the Brooks Act) and implemented in part 36.6 of the Federal Acquisition Regulation (FAR), as well as the "mini-Brooks Acts" found in almost every state law, past broadband mapping contracts were awarded without regard to the experience, past performance, qualifications, or competence of selected service providers. Many contracts were awarded based on price, including numerous awards to the lowest bidder, or to unqualified entities, who had no prior experience, capacity, capability, or record of successful performance of such professional services contracts.

The 2023 Farm Bill presents the opportunity to change course. The new generation of Broadband Mapping, pursuant to the Broadband DATA Act (P.L. 116-130) and Infrastructure Investment and Jobs Act (IIJA, P.L. 117-58), should place an emphasis on the utilization of qualified surveying and mapping firms, selected based on qualifications. NSPS believes additional consultation, coordination, and leveraging between RUS, NTIA, and FCC is now necessary since originally authorized by Section 6212 of the 2018 Farm Bill (P.L. 115-334). Compliance with the Brooks Act, FAR part 36.6 and, in the case of contracts awarded by state or local government using grants or loans from the Federal government, is essential to the success of the current Broadband Mapping. There are numerous reasons this emphasis on qualification and competence, rather than price, as evaluation and selection factors, is not only good policy, but a requirement of the law:

- Accuracy is important for public involvement and government dispute process;
- The Broadband Loop Support (BLS) fabric, if done properly, can provide the base map data necessary for high level design (HLD) for fiber-to-the-home and fixed wireless networks; and
- The use of QBS in the selection of professional surveying and mapping firms will expedite the engineering and construction process for funded areas to get connected.

There is a major need to not just improve the granularity of mapping data, but also to make sure that Federal broadband agencies fully leverage existing mapping efforts in other agencies where data is collected in a consistent standard by surveying and mapping professionals. One example of a partnership where such standardized data is leveraged by numerous federal agencies, and state and local governments and stakeholders, is the U.S. Geological Survey's (USGS) 3D Elevation Program (3DEP). This nationwide elevation dataset using light detection and ranging (LiDAR) technology should be fully leveraged by the RUS, NTIA, and FCC so that the National Broadband Map uses 3DEP data as an accurate base-level map with the terrain and topographic features as well as man-made structures are displayed. As the ISP community builds in their coverage maps using GIS and the "fabric" authorized in the Broadband DATA Act, then a gap analysis is achievable. Understanding the terrain, and covering gaps, 3DEP data can be leveraged for siting, permitting, and deployment of the related broadband infrastructure, above or underground, allowing maximum coverage. [Click here](#) for the 3DEP connection to Broadband Internet Access.



In the 118<sup>th</sup> Congress, NSPS plans to work with Members of Congress to introduce the Broadband Asset Surety Enhancement (BASE) Mapping Act to accomplish these vital reforms.

### **ACTION REQUESTED:**

NSPS respectfully urges Members of Congress to co-sponsor legislation, the BASE Mapping Act, making reforms to broadband mapping efforts to help increase accuracy, and provide an improved ability for RUS, NTIA, and FCC to reduce or eliminate the Digital Divide. For more information, contact John "JB" Byrd, NSPS Federal Lobbyist, at [jbyrd@nswcapitol.com](mailto:jbyrd@nswcapitol.com) or (703) 383-1330.



## FEMA, NFIP & Flood Insurance Mapping Reform

The statutory authority for the National Flood Insurance Program (NFIP) of the Federal Emergency Management Agency (FEMA) will expire on September 30, 2023. Congress passed the Biggert-Waters Act in 2012 and the Homeowner Flood Insurance Affordability Act in 2014 to begin NFIP reform. Further legislation is needed in the next reauthorization to improve the surveying and mapping data needed to provide more accuracy and solvency in the program and fairer premiums for homeowners.

Flood maps identify areas at greatest risk of flooding and provide the foundation for NFIP. Accurate geospatial information is essential to all aspects of flood insurance risk assessment and emergency management (preparedness, prevention, protection, detection, response, recovery). Imagery, map data, and other geospatial assets are of most critical value in emergency response during the initial hours and days immediately before and following a hurricane, flood, or other disaster. This data can be an effective, efficient, and a life-saving tool. In addition, accurate geospatial data facilitates the engineering analysis to perform risk identification and risk assessment. To further improve the nation's flood insurance program, protect homeowners, and help reduce the taxpayers' financial risk, the National Society of Professional Surveyors (NSPS) recommends a number of surveying and mapping (geospatial) reforms –



- Given that elevation data from USGS for flood maps is on average 35 years old, the USGS 3D Elevation Program (3DEP) should be designated as the inter-agency, intergovernmental funding pool to collect and maintain elevation data for flood maps and a variety of other national priority applications. Dedicated funding will enable USGS, FEMA and other cooperators to keep elevation map data current on an 8-year repeat cycle. [Click here](#) for the 3DEP connection to Flood Risk Management. For more information on 3DEP including an e-book, please [click here](#).
- Create a National Structure Inventory to aid in flood mapping and engineering, as well as benefit FEMA, first responders and other related agencies providing reliable, accurate data to streamline structure, infrastructure and safety assessments, including response and recovery time, as well as accurate pre and post disaster structure risk assessment and assessment values; simplify the sale, rating and processing of flood insurance; create a cost effective, efficient and accurate structure and infrastructure inventory providing our nation a single platform of flood mapping assessments and inventory.
- Include address and parcel data to permit the integration of address information with structure/parcel information in flood insurance processing and emergency response; to enhance data available for insurance rating; to permit first responders' access to data for life saving activities in a declared emergency.
- Strengthen the USGS National Streamflow Information Program. The USGS streamflow network is critical to the NFIP and flood risk mapping and assessment. Data sharing between FEMA and USGS, including from real-time data feeds, should all be supported in the framework of the NFIP reauthorization.
- In addition, FEMA should: 1) create national, geo-enabled, web access to maps, similar to North Carolina ([www.ncfloodmaps.com](http://www.ncfloodmaps.com)); and 2) ensure that qualifications based selection (QBS) contracting be utilized for all surveying and mapping services.

In the 117th Congress, Representatives Vicente Gonzalez (D-TX) and Alex Mooney (R-WV) [reintroduced](#) legislation ([H.R. 4088](#)) known as the Improvement of Mapping, Addresses, Geography, Elevations and Structures (IMAGES) Act of 2021 to accomplish these vital reforms and will reintroduce the bill again in the 118<sup>th</sup> Congress.

### ACTION REQUESTED:

NSPS respectfully urges members of Congress to cosponsor legislation making technical reforms to the flood maps to help make the program more solvent, increase accuracy, and provide an improved ability for FEMA to quantify risk and provide a more fair and equitable insurance premium program. Representatives are asked to cosponsor this bill by contacting Chandler Mills in Representative Gonzalez's office at 5-2531 or Blayne Callas in Representative Mooney's office at 5-2711. Senators are asked to sponsor a companion bill to this House legislation. For more information, contact John "JB" Byrd, NSPS Federal Lobbyist, at [jbyrd@mwcapitol.com](mailto:jbyrd@mwcapitol.com) or (703) 383-1330.

# TRESPASS LAW PERSPECTIVE

By: G. Stewart Nash

Many surveys carried out concerns the probability that you or your crew will need to have access to someone's private property in order to conduct your work. Contrary to the thought process some individuals retain, either through ignorance or due to an 'I really don't care attitude', we do not automatically have permission to survey on private property. The survey license is not a license to trespass. This is one area of our work that, when handled inappropriately, gives that landowner a reason to not only dislike you personally, but because you are a surveyor, to dislike surveyors in general and because of that one incident deny access to all future surveyors he comes in contact with. Have you ever heard words like, "Heck no, I'm not letting you on my property! The last surveyor that was here was caught red handed driving stakes in my wheat field and he ruined several bushels of prime wheat. Never even bothered to ask. Got darn smart aleck about it too. Said he had a right just because he was a surveyor. I told him you also got a right to get your pants full of buckshot if I ever catch you on my place again. So, you just go on about your business, but stay off my property." One unhappy landowner tells another, who tells another, and so on, and surveyors in general end up with a not so professional image.

Trespass is one of the top reasons we surveyors are not currently held in high esteem with the public. Perhaps the primary reason though, boils down to attire, or how the public generally perceives us when we are dressed in torn jeans and tee shirts with a goofy picture or inappropriate saying. Even though it might not be the registered surveyor the public sees, the rodman or instrument man is the 'surveyor,' in the public eye. Attire at our annual conference is another mode of exposure that can leave a positive or negative perception of our desire to be called a Professional.

Following is an example letter that meets all the requirements of the current trespass law. The letter would only need to be used if you cannot get in touch with a landowner to ask for permission to enter, or if a landowner refuses access simply because he does not like your client, whether it be the neighbor or the government agency you are contracting for, or because of another surveyor who didn't bother to get permission.

*Dear Mr. Landowner:*

*In effort to fully meet the Entry to Property law as found in the Montana Codes under 70-16-111 MCA, we wish to notify you that XYZ Surveying Company has been retained to perform a boundary line survey which necessitates that we locate one or more public land survey corners situated on your property. This survey is being conducted for your neighbor, Mr. Bill Landowner for the purpose of a fencing project.*

*The licensed professional land surveyor in responsible charge for the project is Mr. John Surveyor. The field crew chief that has been assigned to conduct the survey is Mr. Fred Surveyor, accompanied by his helper Mr. Sam Surveyor. They have been scheduled to begin the survey on October 30, 2008. Mr. Surveyor 2 would like to enter your property at the nearest location to the section corner needed, which is near the road running past your ranch house. If possible, John Surveyor*

*would like to meet you at your home at 9:00 A.M., in effort to go over what has to be done to complete the survey and to get your instructions regarding off road vehicular or ATV travel, as well as the brushing off any tree limbs that might hamper the survey. Perhaps you might know where the section corner is located and can direct the survey crew to it. In turn, should our survey necessitate the need to determine the position of any missing corners, or if we locate a corner that you are not aware of, we would be happy to explain our methods and results in order to allay any concerns you might have. Also, should you have a tenant or lessee to the property that we need to be in contact with, would you please inform us.*

*We anticipate that entry onto your land will have to be conducted no less than twice, but unforeseen things might dictate additional entries. We will certainly apprise you of extraordinary conditions. Should the results of our survey prove to be of some benefit to you, we will be happy to furnish you a paper copy of the survey if one is made for filing.*

*Please acknowledge receipt of this notice before October 30 and if you have any concerns we need to address prior to meeting with you on your property, just write them down on the enclosed acknowledgement, or give me a call and we can discuss them.*

*Thank you for your cooperation in this matter.  
Sincerely,*

Always try to get in touch with the landowner prior to entry. If the owner cannot be reached by phone prior to going to the field, leave a phone message explaining your need to access their property and ask them to call you. If you are in the field and discover a need to access someone's land and they are not at home, as a last resort, leave your business card and your message in their door. You still might get a phone call from an upset landowner by doing so.

Do not drive anywhere that may leave vehicle tracks or cause the spread of noxious weeds that might have been picked up on a previous survey, without the owner's permission to do so. When I was newly registered in Colorado, I had a leaseholder very upset with me for ruining his grazing land by driving across the grass, one time. He stated that the smashed down grass will take years to come back, if ever. When you stop to consider that theory, how much potential livestock feed has your own truck tires ruined by driving a half a mile to a corner and back? I do know tire tracks can be visible for several years, so there is validity in the rancher's statement. But I was a somewhat ignorant in those younger days plus, being newly registered I thought I knew a lot more than I really did. A few years ago I heard about a young fellow about as smart as I was at that point of our careers, a crew chief of a surveyor in eastern Montana who drove along the edge of a muddy field and left ruts nearly six inches deep. After a phone call from an upset farmer, he was seen out there the following day filling in ruts with a shovel, and on his own time.

Driving through tall grass may sweep the underside of the truck clean of stuck on residue but leave noxious weed seeds clinging to inconspicuous places. According to the trespass law, if the landowner requests your vehicle to be thoroughly washed, including the underside to prevent noxious weed contamination, you must do so prior to entry.

Do not cut trees without permission. A surveyor I know along the eastern slope paid a hefty price for cutting a four-inch tree on private land. In one incident, I had a partially trained crew chief starting to cut limbs off a tree in a lady's yard when she came frantically running out of the house. They had not

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even taken the time to knock on the door and tell her why they needed to go through her yard. Another crew chief I'd employed cut down several thousand dollars of prime timber in the central Montana area, because he didn't want to make extra setups.

Never leave a gate open, even for a quick trip a quarter mile away. I have seen nearby livestock head for an open gate as soon as I got back in the truck. You do not want to have to pay for a prize bull that got through the gate onto the highway and was hit by a truck. If you create a habit of always closing the gate, you don't have to wonder late at night while lying in bed whether or not you closed that gate you entered when you exited by a different gate.

Another function we often perform that irritates landowners has to do with city lot surveys, and that involves the digging of holes in lawns. Even though the property pin is a few feet inside the sidewalk, most landowners consider their property to go to the sidewalk. They water it, mow it, and by golly - don't take kindly to someone digging it up. I once had a man come at me with a shovel, screaming obscenities. He was not at home when we started digging but someone drove by and went to where he worked to inform him of the dastardly deed being done in his yard. It took several minutes of quiet, controlled talking to calm him down enough to understand what we were doing and why. Resolve the issue before it comes up by knocking on their door if you need to dig up a pin. If you explain how you will dig and remove the sod and replace it, so they'll hardly know the difference, then you won't have them

calling the city to report you. If you use a small plastic sheet to put the sod and extra dirt on, then there's no mess to try and clean up, particularly when grass is wet.

On a serious note, a surveyor was shot a couple of years ago while corner searching in Oklahoma. He was standing on highway property with a metal detector in hand. He had not bothered to disturb the adjacent landowners with a knock on the door and who normally does in that situation. But an elderly lady thought he was a burglar, so she retrieved her gun and blasted away. The young man nearly lost his life over it. Could that same thing happen to you or one of your crew members? It's best to announce yourself when 'skulking' around peoples back yards. That's how they see it. It is wise to wear an orange vest when doing so, as a form of identification. At least you look legitimate.

So, from these few experiences of others and myself, they address a few of the concerns that are not always passed on to the crew chiefs or the LSI fresh out of school. Doing things the right way, the way you would want to be treated if you were the landowner, is how we should be teaching those who would follow in our footsteps. Proper conduct regarding others property is merely courteous acts that leaves a good impression on the public.

Like the sign said on the back of a truck I saw, "Use Your Brain!" Think before taking action that could easily come back on you, and on the company you represent.



## CONDOLENCES

Dave Schurian (PLS 3102) passed away recently and Eric Green commented that Dave was his mentor, he had worked with him in Tucson when he had just gotten out of survey school in NY; he was like a father to him. He was also fortunate to work at PCI in Missoula for several years, a company Dave had help start years ago, with Dick Ainsworth, Tom Hansen, Ken Jenkins and Toby Dumont and several other great surveyors.

Dave, 83, was born in Santa Monica, CA, on 3/30/39, to Richard and Opal Schurian. He began what he called his next greatest adventure in the early morning hours of 3/16/23. He had been dealing with Alzheimer's for some time and is now free to survey heaven's corners and play the harmonica with the angels.

Dave began his land survey business in Victor, MT, then joined Professional Consultants in Missoula. He often said that he did for work other people did for play. He loved surveying in the mountains and was registered in many western states.

In 1988, Dave and Bobby moved to Tucson where they lived and worked for 20 yrs. After

Bobby retired, Dave put her to work on the survey crew and they migrated south to survey together in the high desert areas of Rodeo, NM and Portal, AZ. They enjoyed finding corners, riding the ATV across the desert, always hoping there would be enough satellites to get the job done and that the equipment cables would hold up.



He leaves Bobby, his wife of 57 yrs, two daughters, Tamara Schurian of Bremerton, WA and Jennifer Young, of Glendale, AZ, as well as grandchildren Nathan and Madison (Sweet Pea) Young. Also his sister, Julie Crockett, of Stevensville, MT.

For many of you, your prayers and kindness sustained us through many difficult days. Thank you also for your thoughtful cards and support as we transition to life without the ol' Buzzard.

At a later date, there will be a gathering where a memorial survey corner will be placed in honor of Dave (Buzz).



## Certificates of Survey - Deeds at Filing?

By: Dan Stahly, PLS

Reprinted from 2018 TSS

Serving as a Subdivision Administrator and Examining Land Surveyor for several Counties in the state of Montana, I get to be involved in County and State opinions when it comes to the filing of Certificates of Survey (COS's). One topic that has been coming up this year is whether new deeds or agreements need to be recorded when filing COS's.

Many County Subdivision Regulations are interpreted to require new deeds to be filed when a COS is being filed that "divides" land. Some of the exempt divisions in 76-3-207, MCA fit into this category. But what happens when the landowner is singular, and they do not wish to file or record anything but the COS? Many County's don't know what to do with that, and with the Department of Revenue in the picture with tax appraisal and mapping updates, they don't either.

I've been told that a person cannot file a deed that transfers land to themselves, but the legal opinion on that topic seems to be debatable (i.e. warranty deed vs quit claim deed). Regardless, let's run through a scenario of deeds not being recorded, but a COS being filed. In this case, let's say it's a boundary relocation involving tracts of record, all owned by the same person. The assumption is that land title boundaries don't physically move until real interest is exchanged, and the COS itself does not actually move the boundaries, but rather illustrates and describes the intent/agreement, should deeds ever be filed. The County Subdivision Regulations read something like this (usually Section V-E-1(b), Required Information):

Certificates of survey claiming this exemption must clearly distinguish between the existing boundary location and, in case of a relocation, the new boundary. This must be accomplished by representing the existing boundary with a dashed line and the new boundary, if applicable, with a solid line. The appropriate certification set forth in ARM 24.183.1104 (1)(f) [Appendix A] must be included on the certificate of survey. Certificates of survey showing the relocation

of common boundary lines must be accompanied by a quit claim or warranty deed or recordable agreement from [adjoining property owners](#) for the entire newly described parcel(s) or that portion of the tract (s) that is being affected.

A peer of mine recently pointed out that the words *adjoining property owners* are noteworthy (thanks Matt!). In this example, there are no adjoining property owners, but rather just one landowner of the newly described parcel(s).

A lot of us involved in exempt division projects consult our clients from the beginning to end of the project, a task that involves more than measuring and platting land. Consulting is an important part of the services we offer. Collectively, our profession has a well-earned seat at the table in exempt division discussions, policy, and government agency attitudes towards them. If the Department of Revenue is unable to "perfect the COS" to update tax appraisal mapping without new deeds being recorded, that is something that our clients should be aware of. It seems like the public agency trend is to use deeds and realty transfer certificates to "perfect" all exempt divisions. Maybe I am just behind the curve in this discussion. I would opine that most smaller Counties are.

Another recent experience is regarding a retracement COS that involved meandering boundaries along a US Government Lot. Retracement COS's don't require landowner signatures, much less deeds or realty transfer certificates to be recorded. However, if a boundary changes from the last time the property was platted or described, should they? And is it up to the Governing Body or State to require it when a survey is performed? It's left up to the landowner, and adjoining landowners might not even be aware that a COS has been filed. In this case, their taxes are not going to be adjusted.

With the COVID pandemic and folks having more time to do long-term estate planning, getting property survey, platted, and in order seems to be on the rise. These types of projects may take preliminary research and communication with the County in which the land is owned. I see this as an educational opportunity, and as professionals that are adept in the pertinent statute, rules, and regulations, we do bring a LOT to this discussion.



**MAGIP Conference  
MARLS booth with President Chris Kosine**



Attending the MAGIP conference in April visiting the MARLS booth:

- (Seated left) = Kazi Arifussaman, MSL Real Time Network Coordinator
- (Standing left) = Tim Penfield, NECI GIS Coordinator
- (Seated middle) = Wallace Gladstone, NECI, MT Board of Professional Engineers and Land Surveyors
- (Seated right) = Brian Shaw, National Geodetic Survey, Rocky Mountain Regional Advisor



*Pictured on the left with a smile on his face is our Immediate Past President Stew Willis pictured auction night at the 2023 conference after passing the gavel on to President Chris Kosine!*

*Thank you Stew for your dedication as our 2022 - 2023 MARLS President!*

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# The Importance of Workforce Development:

## Why it is critical & A few ideas to help you get started.

By: Trent J. Keenan, PLS



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[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

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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.

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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

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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

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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 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.

[One more side note: I will have an entire article devoted to Servant Leadership in an upcoming Nevada Traverse this year and it will hit on this topic in more detail.](#)

### [About the Author](#)

Trent Keenan, PLS, WRS, CFedS. Trent's surveying career started when he was 19 and now spans over twenty-five (26) years, including ten (10) years in the public sector working for a large utility company, and fifteen (16) years in the private sector, with 14 of the 16 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 NALS Von Schmidt Award in 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 for the Land Surveying Profession as well as Wisdom Wednesdays, 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.





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Vivian Weaver would like to add that as a retired PLS and having earned my survey degree from Montana, the TSS was a powerful tool that kept me in tune with the profession and gave me knowledge of new equipment to seek more information about. (I still read it after retirement and am amazed at how far the equipment has come). We have many LSI members, Associate members, and surveying student members graduating every year in Montana. The TSS is a great way to keep them in the loop of progression in this industry.

Before you decide not to advertise, please remember when you yourself are learning something new and how helpful it is to have as much information you can gather at your fingertips. Your ad will not get lost with us in pages and pages of advertisements because with our Treasure State Surveyor your ad is only seen by our subscribers in the mailing version. It is also in the PDF version on [www.marls.com](http://www.marls.com) for the membership to see by PDF. This magazine is given out to all our members at no cost to them.

Please help us keep this magazine in print and our future surveyors fed in the knowledge of shared experiences.

Below are prices for advertising and the contact information to send them. MARLS Sustaining members receive a discount on advertising in the TSS and also a complimentary spot on the front page of the MARLS website to advertise your firm. MARLS membership application is available at [www.marls.com](http://www.marls.com)

Submit ads in jpg format and pictures in jpeg or tiff only to both Kay at the email addresses below. Thank you for giving the MARLS Treasure State Surveyor advertising consideration.

Sincerely,  
Kay McDonald, MARLS Treasure State Surveyor editor

Kay McDonald, MARLS Executive Director  
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**Thoughts on Professional Practice and Education**  
**Article 4: Business And Management in Education**

**By Knud E. Hermansen <sup>†</sup>**  
**P.L.S., P.E., Ph.D., Esq.**

This is the fourth article I have prepared in the series offering thoughts on professional practice and education. The focus of this article, I hope, will assuage some individuals that I offended by my last article and will give hope to friends that will see I am now writing with the sense that I appear to have lost with my last article

I know I am not alone when I say I wish I knew as a young surveyor what I now know about running a business. I can stand in front of a dozen or more surveyors that run their own surveying business, some for decades, and discuss rules and regulations that by law apply to them. What I reveal shocks many of them as they realize the deficiencies in their knowledge and business practice. They were unaware or confused about rules and regulations they should be adhering to or should have adhered to when running their business.

I might quickly add, I will not claim to know the entire plethora of knowledge on government regulations as applied to businesses. Who would know all the governing rules except for the most dedicated bureaucrat or regulator? Sadly, the federal, state, and local governments continue to do their best to create more difficulties in starting and running a business – especially if you contract with the government.

The first time a surveyor hears the phrase ‘cash flow’ should not be during their first year of owning a business as they sit in their office, the time near midnight, the pay for employees due the next day. Having never heard of the term ‘cash flow,’ the new business owner cannot understand how they must pay sooner using what they won’t have until later.

The new graduate that is checking into the human resource manager at the onset of their surveying career should not wonder what is meant by a 401k, employer match, vesting periods, and pre-tax contributions.

This missive is not meant to discuss politics or even the various subjects that may fall under the concepts of ‘business’ and ‘management’ education. Rather, the focus is to advocate that relevant business and management topics be presented to students studying in a four-year surveying program.

Faculty would be disappointed when collecting alumni data to discover graduates described their job title as ‘survey technician’ ten years after graduation. After ten years, the graduate is expected to be licensed and in management. Yet, many survey programs have failed to

give students any relevant knowledge that would aid the graduate to take on management positions where survey graduates are expected to spend most of their professional careers.

I would opine the lack of adequate business and management courses in surveying programs stem from two conditions. The first condition arises because of the lack of business and management experience that faculty have. Many faculty do not have the experience, training, or knowledge to teach relevant business and management courses. Even survey programs at larger universities can’t always draw on the business school faculty to help educate the surveying student in relevant business courses. While the business school faculty may be able to educate the surveying student regarding contracts, business entities, employee law, etc. topics such as mechanics liens, survey fee makeup, right of entry laws, road safety laws, Dig-safe, OSHA, federal contracting, and other such survey specific areas will not be covered in a course taught by the business school.

The second condition thwarting the introduction of business and management courses into a surveying program is the difficulty in fitting more courses into a surveying degree program. Universities limit the maximum number of credits for a bachelor of science degree. ABET accreditation requires certain courses and credit hours. NCEES has established topics covered in the FS exam that must be covered in the academic program. Finally, the university requires all students at the university take certain courses for the regional accreditation the university maintains.

If the reader will indulge me, I will get upon a soapbox regarding the last limitation mentioned - that is University accreditation requirements. I have found it frustrating that regional accreditation often requires courses such as diversity, artistic expression, humanities, and other general education courses popular among liberal arts faculty but worthless in a business or a professional environment. (Not all general education is dismissed by practitioners. Course such as communication and writing courses are the exception. These courses and their content are appreciated by employers.)

For 30 years I have examined hundreds of employment-surveys prepared by alumni and survey employers sent by the University for program self-improvement. In those 30 years and after review of hundreds of documents, I have yet to see a single employer or alumni say how useful artistic expression and similar courses have been toward their career. The mention of these courses is a common occurrence but only under a category where alumni cite courses of no use in their life and wasted tuition money.

Having given my opinion, I now offer advice by suggesting professional societies that advocate for surveying programs also look at the courses in the survey program to ensure there are business and management

courses that provide the graduate with the knowledge to become leaders in both the profession, community, and a surveying business.

† Other books and articles by Knud can be found at <https://umaine.edu/svt/faculty/hermansen-articles/>



**Thoughts on Professional Practice and Education**  
**Article 5: Removing Examination Pre-requisites**  
**By Knud E. Hermansen †**  
**P.L.S., P.E., Ph.D., Esq.**

This is the fifth article I have prepared in the series offering thoughts on professional practice and education. In this article, I wish to discuss the timing of professional exams. In particular, I wish to advocate allowing an applicant to take their licensing exams before obtaining any required experience.

There are two common models of examination sequence found in the United States. The first model, that appears to be most common at the present time, requires the applicant take the professional surveyor exam and state specific exam after the experience requirements have been met.

The second model is to permit an applicant to take all three exams at or near graduation and before meeting minimum qualifications.

There was a third model that may still be present in some states. The third model was to require the experience first then allow the applicant for licensing to take all the exams within a short window of time. When I was first licensed almost fifty years ago, I took the first exam one day and the second exam the very next day.

In this article, I would like to advocate that states allow an applicant to take the exams on sequential days at or near graduation. I offer two reasons for my position.

For my first reason, I would suggest that taking the professional exams near graduation is the best time in life's journey to schedule and have time to take the exams. By the time the graduate achieves the pre-requisite experience for licensure, they are often married – perhaps with young children, involved in community activities, and have a full employment commitment. It is difficult to find time to study or even take time off from work for testing. College breaks are usually far less stressful and a less busy time than the hectic and stressful work schedule a graduate will encounter after graduation. To emphasize this, let me remind surveyors that as a full-time student in college, the student could count on two to three weeks off at Christmas, one week off during Thanksgiving, and a one or two-week spring break. College breaks were

known well in advance, allowing for professional test scheduling.

Once the graduate is employed, vacation time or personal days must often be used for testing. Time off from work must often be scheduled in advance and authorized only when work allows. While college can be stressful, the stress of college often pales in comparison to balancing family responsibility, home, and work commitments.

The second reason for allowing all tests while in college or shortly after graduation is the extent of retained surveying knowledge. Broad knowledge of surveying is usually at a maximum retention just before or soon after graduation. Therefore, the best chance to pass all three exams with minimum study is at or near graduation.

Some would argue that testing the graduate on knowledge retention after the graduate has some experience is a reasonable procedure to protect the public's safety. Perhaps this statement is true. Yet, on that basis, all licensed surveyors should be periodically tested from time to time to insure knowledge retention after the passage of time. I suspect there are very few licensed surveyors that would advocate that they be subject to periodic retesting to ensure knowledge retention.

Having given my opinion, I now offer advice by suggesting professional societies encourage statute or rule changes allowing all exams be taken soon or at graduation. Of course, the soon-to-be graduate has another option. The student can apply to test in a state that does allow all testing at or near graduation. The applicant does not need to journey to a particular state since NCEES offers the same exams at testing centers throughout the United States. Perhaps the applicant would have to delay taking the state specific exam until they are eligible for licensing within that state. Of course, the one hurdle that may arise from this recommendation is a state that will not accept the NCEES test score for an exam taken before experience was achieved. I know of at least one state that will not accept the PE exam score if the PE exam was taken before experience was met. I know this does not make much sense but bureaucracies and their rules often do not make sense.

† Other books and articles by Knud can be found at <https://umaine.edu/svt/faculty/hermansen-articles/>



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**Montana Association of Registered Land Surveyors Scholarship Foundation, Inc. (MSF)  
First Year Surveying Student Scholarship Application Requirements  
MSF Scholarship Application must be submitted by August 1, 2023**

**MARLS Scholarship Foundation has scholarship funds available for students who are interested in pursuing an education in surveying.**

A number of scholarships of up to \$2,000 may be awarded for the 2022-2023 school year to students entering the 1<sup>st</sup> year of a 2-year surveying curriculum or the 2<sup>nd</sup> year of a 4-year surveying focused curriculum, either of which is recognized by the Montana Board of Engineers and Land Surveyors as meeting the requirements for a person to eventually become a Licensed Professional Land Surveyor. A Montana High School Graduate attending a comparable curriculum at an out of Montana institution will be eligible for a 1st year scholarship, providing they can offer proof that the curriculum meets the requirements for becoming a Licensed Professional Land Surveyor in the State in which the curriculum is offered. A person entering a 4-year curriculum will need to be registered in at least one surveying related course during their 2<sup>nd</sup> year.

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6. If necessary, provide proof that the curriculum of an out of Montana institution meets the requirements for becoming a Licensed Professional Land Surveyor in the State in which the curriculum is offered.
7. Your high school grade transcript to date. If you are in a 4-year program, your grade transcript to date.
8. The name of the school you are planning to attend or have been attending and the program you will be enrolled in.
9. A one-page essay describing what interested you in pursuing an education in surveying, and your career goals.

**Your application packet shall include the following statement along with your signature and the date:**

*"I hereby certify that all the information on this application is true and correct. I understand that any false information in, or deliberate omissions from, this application may be grounds for rejection of the application and withdrawal of any scholarship award offer. I agree that I will abide by the decisions of the MARLS Scholarship Foundation Board of Directors as they relate to this Scholarship application".*

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**MARLS Scholarship Foundation, Inc. (MSF)  
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**Application:** Scholarship awards will be determined based on a combination of academic achievement, financial need, work history, course of study, and a submitted essay. To apply for scholarship funds, please supply the following information in a neat and orderly format (It is important for you to recognize that the Foundation takes into consideration how well the requested information is presented):

1. Type of scholarship being applied for.
2. Full name, address, telephone number, and email address.
3. Description of financial need.
4. Work experience, especially any surveying experience.
5. The name and location of the institution you attended for your 1<sup>st</sup> year (or 2<sup>nd</sup> year if appropriate) of surveying education.
6. Your post high school grade transcript to date.
7. Name and location of the institution you are planning on attending for your 2<sup>nd</sup> or 3<sup>rd</sup> year of surveying education.
8. If necessary, proof that the curriculum of an out of Montana institution meets the requirements for becoming a Licensed Professional Land Surveyor in the State in which the curriculum is offered.
9. A one-page essay describing what you have learned about surveying to date and how that knowledge will assist you in achieving your career goals.
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You can contact Stewart at [grantnash1942@gmail.com](mailto:grantnash1942@gmail.com) for information and explanation. TO ORDER THE BOOK "The Western Nomad – Memoires of a Land Surveyor", Stewart's 50 years surveying career, please order from Kay at 406-253-5527 - \$10 plus S/H.

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Montana Association of  
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#### Contents:

- Montana Subdivision and Platting Act
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  - Uniform Standards for Certificates of Survey
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- Montana Sanitations in Subdivisions Act
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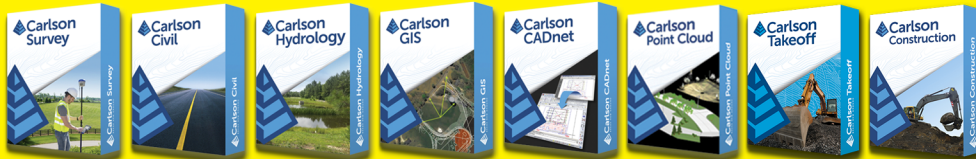
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[Illinois Mutual Quoting Tool](#) can be found on the MARLS website in the member site.

You then have the option of emailing the agent Ray Kojetin at [raykojetin@gmail.com](mailto:raykojetin@gmail.com) with your contact information if interested in this valuable member benefit. You may also view this at [www.marls.com](http://www.marls.com) in the MARLS member's only site.



The articles that appear in the Treasure State Surveyor have been selected to assist you in the advancement of not only the profession of land surveying at large, but also in your pursuit to better offer professional services individually, to better your company's integrity level, to hopefully increase your financial success and to promote the public health, safety, and general welfare for your clients. It is time for you to get involved through your articles, ideas and involvement.

Please submit your articles of interest, humor and experiences to be included in the next issue of YOUR publication of the *Treasure State Surveyor* to [kay@marls.com](mailto:kay@marls.com). Your involvement is greatly appreciated.

This is our challenge to everyone in our Society to share some history and photos for all to enjoy.

Our goal is to print in each quarterly issue a "Survey Monument History Moment" article or any article from our MARLS members. Send your history article to Kay McDonald at [kay@marls.com](mailto:kay@marls.com)

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