

August 2022

# SIDE SHOTS

Professional Land Surveyors of Colorado

Volume 53, Issue 2



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Surveying**  
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# SIDE SHOTS

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On the Cover: Teresa Smithson, PLS

*Side Shots is the official publication of the Professional Land Surveyors of Colorado, Inc.  
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President's Corner  
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As we look back and celebrate the RMSS success in training, networking, and business development, I can't help but pause to contemplate our development efforts the rest of year. As fabulous as the conference always is, three days each year is simply insufficient time to meet the development needs of ourselves and our staff.

It so easy to say, "I'm just too busy" or, "I'll do that next week or next month". Then we blink and half the year is gone. No one means to sacrifice professional development on the altar of business, but it happens to most of us annually and likely all of us at some point in our career.

With this in mind, I encourage each of us to take steps today that mitigate the propensity to let the most important things go by the wayside in favor of the most pressing things. Take time to be intentional about personal and professional development for both yourself and your staff. Schedule time at least weekly to reflect on your goals, their relevance, your progress towards meeting them, and any course corrections necessary. There are many great resources to help with goal creation and plan execution.

Apply this same focused purposeful mentality to developing your staff on a regular recurring basis and watch the benefits roll in beyond your expectations. Investing in our people must be our primary endeavor in spite of how desperately busy we are. Training, mentoring, and encouraging our staff does not *cost* it *pays!*



Stay safe...outside and inside!

Ralph Pettit, PLS  
PLSC President



## FROM THE EDITOR

In this issue of Side Shots, we have a great mix of content. And we celebrate Professional Land Surveyor Theresa Smithson.

Thank you to our supporters, contributors and our president.

Before you read the Bob Green article, I encourage you to first read his American Surveyor article with the same title. His Side Shots article is stand alone, but you will benefit from the background information. And once you have consumed the articles, Bob encourages our readers to give him feedback and send questions.

I don't know about you, but many of our readers are new to our discipline and are finding it difficult to navigate acquiring licensure. If you haven't already read it, I encourage you to read Tom Sylvester's letter regarding Colorado educational requirements. He can't address everyone's specific situation, but he does a great job mapping it out for most. Thank you again Tom.

As always, we appreciate the updated list of BLM cadastral surveys, thank you Janet Wilkins.

Already the PLSC is ramping up for the Rocky Mountain Surveyor's Summit, RMSS and I very pleased to hear

that this February the PLSC is hosting Dennis Moulard. He is a PLSC favorite, and we are excited that he is going to present for us again in 2023. With that, we also need to recognize the yeoman's work Todd Johnston and Brian Bowker did while leading our annual conference for the first time this year, and they are doing again next year! Check out the "Look Back at 2022" article.

The AES board plans to answer commonly asked questions and address issues that the board sees professionals struggling with by contributing periodic articles in Side Shots. This issue Kelly Miller addresses LSP dimension and conflicting boundary evidence. He articulately defines the issue and provides a clear and supported solution. A special thanks to the Kelly and the AES board, for all their hard work and what they do for our profession.

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## CALL FOR CONTRIBUTIONS

*Side Shots* is the official magazine of PLSC. If you have an article, information or nomination of a "Young Surveyor" a surveyor who has been in the profession for less than 10 years and has chosen a surveying career to highlight, send your information or recommendation to [sideshots@plsc.net](mailto:sideshots@plsc.net).

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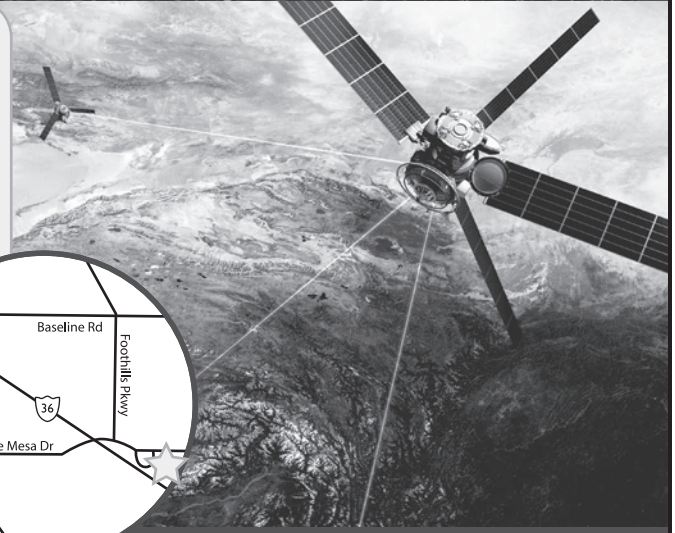
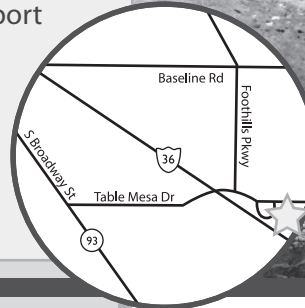
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# A Look Back at the 2022 Rocky Mountain Survey Summit

by Todd Johnston, PLS – RMSS Committee Co-Chair

The 2022 Rocky Mountain Survey Summit (RMSS). WOW! What an experience! Thank you so much to those of you who attended the Young Surveyors Network meeting, the In-person Summit, the Saturday Technical Sessions and the Virtual/On Demand Summit. It is because of your support that the RMSS continues to flourish and be successful!

In July 2021, Brian Bowker (RMSS Committee Co-Chair) and I were asked to take over RMSS Committee Chair duties. I must admit, at that time I sounded confident in our abilities to manage this event, but in the back of my mind I knew there was going to be a STEEP learning curve! Lucky for Brian and me, we had an awesome group of dedicated folks with us on the Committee. Many of those folks are vets at putting on the Summit and their guidance and counsel was invaluable!

Fast forward to the morning of February 23rd and I'm pretty sure I had a "deer in the headlights" expression. This was the culmination of a lot of hours of work with ups and downs. The thing that put me at ease were many familiar faces and friends in the surveying community that I had not seen face to face in years. I suddenly remembered that one of the best parts of attending these types of functions was not only the education, but seeing old friends, making new survey acquaintances, and swapping survey stories! Among the

great people I met and spoke to, there was one surveyor who I had not seen in 28 years! In 1994, I crossed paths in the field with this surveyor (who worked for a different company). He took the time to explain the nuances of corner accessories to a young rookie instrument person who had that same "deer in the headlights" expression when looking for a buried section corner in a remote county road. I was amazed that he remembered that day and knew exactly the location of that meeting. After many years I was able to express my gratitude to him for that lesson.

One of my favorite moments of the Summit was at the "Solve a Boundary Problem" session. Those of us that planned that course were not sure what kind of participation and reception we would have. As Roger Nelson guided the full classroom through the problems I was struck by the amount of lively discussion at each table. Every participant brought their unique education and experience to the problems presented and it was a lot of fun hearing the different points of views that were shared. I enthusiastically texted Kayce Keane (RMSS Committee Member) that "It's a hit! It's a hit!". We will definitely have this class again at future Summits.





As the Summit went on I was inspired by the professionalism of our speakers. It didn't matter how many people were in their class, they spoke about their topics enthusiastically and welcomed one on one discussion during the breaks and after the sessions. Our main goal was to ensure that all the participants got quality education and had a great time. Thanks to our lineup of fantastic speakers (in-person/virtual) and Vendors, I believe we achieved that goal.



Of course, not everything was perfect and there were issues along the way. It is my pledge that we learned from those issues and mistakes and will strive to do better. Brian and I are back as Committee Chairs and

the RMSS Committee is already hard at work planning the 2023 Summit. Our format will look a little different next year. The days will be shorter and lunch time will be expanded for meetings, socializing and networking with our vendor partners. Our main focus is still to deliver quality education to the surveying community.

In conclusion, I would like to express my gratitude to the following people:

RMSS Committee members who worked so hard to plan and put on the 2022 RMSS: Brian Bowker, Kayce Keane, Shaun Lee, Heather Lassner, Becky Roland, Adam Young, Steve Parker, John Houston, Dave Berglund and Robert Boehm.

RMSS Photographer: Emily Pettit



Speaker Liaisons: Ian Cortez, Stan Vermilya, Shaun Lee and Laine Landau.

PLSC Vice President: Brian Dennis who handled all things in the sand.

A special thanks to PLSC President: Ralph Pettit. Being a rookie at the Summit, I gave Ralph very little input on being the master of ceremonies. Like a true professional, Ralph took the bull by the horns and made it happen. He did a fantastic job! You sir are a true leader!



# Education Requirement for Colorado Professional Land Surveyor Licensure “In My Opinion”

**By Thomas W. Sylvester, P. E. and P. L. S. Program Director and Technical Instructor for Land Surveying and Geomatics  
Western Colorado Community College,  
a division of Colorado Mesa University**

I have been getting numerous inquiries about the educational requirements for licensure as a Professional Land Surveyor in Colorado. It has come to my attention from the rest of the PLSC Board of Directors that there are a lot of folks asking about this subject and a lot of confusion about what is involved.

For some background, in 2010, the Colorado Legislature enacted some amendments to the Professional Land Surveyor’s laws, one of which repealed the portion of the law for recognizing the 10 years of mentoring experience, in lieu of education, as one of the routes for eligibility for licensure. To accommodate those surveyors already in the pipeline who were working for licensure using the 10-year mentoring route, the law allowed the mentoring route to remain in effect until July 1, 2020 at which time it was repealed. As a result of that legislation, licensure now requires a certain amount of education for eligibility.

Also, within the last couple of years, the AES Board changed the application process for Land Surveyor Interns and Professional Land Surveyors.

Previously, one provided the AES Board with their education and work experience prior to being admitted to the Fundamentals of Surveying (FS) exam for the LSI enrollment. If the Board deemed the education and experience were sufficient to be enrolled, they granted permission to take the FS test.

Upon passing the test, the Board would then enroll the individual as an LSI.

After becoming an LSI, one previously would then provide the AES Board with their education and work experience prior to being admitted to the PS exam and the State Specific exam, which were given in the same day. Again, if the Board deemed the education and experience were sufficient to be licensed as a PLS, they granted permission to take the PS exam and the State Specific exam. Upon passing the exams (both), the Board would then issue the applicant their PLS license.

Now, the individual provides his/her education and work experience to the National Council of Examiners for

Engineering and Surveying (NCEES). The individual self-attests that they have the appropriate education and experience when applying to the NCEES to take the FS exam.

NCEES then gives the FS exam and notifies the applicant whether they passed the exam or not. If the applicant passes the FS exam, they then apply to the AES Board for enrollment as an LSI. Certain forms needed to be filled out and requests made to the NCEES to provide the Board with the education, work experience, and examination score on the FS exam on file with the NCEES as part of the application. If all criteria are met, the Board then enrolls the applicant as an LSI.

In a similar fashion, the applicant would continue to add to the education and work record file at NCEES. The individual again self-attests they have the appropriate education and experience when applying to the NCEES to take the PS exam.

NCEES gives the PS exam and notifies the applicant whether they passed or not. If the applicant passes the PS exam, they then apply to the AES Board to take the State Specific exam. If the Board deems the applicant is enrolled as an LSI, the education and work experience requirements for licensure are met, and the NCEES indicates the PS test was passed, the applicant is allowed to take the State Specific test. If the State Specific test is passed, the Board then licenses the applicant as a PLS.

However, apparently there are now numerous applicants that after passing the FS exam and/or the PS exam make their application with the Board, and the Board deems either the experience and/or the education is insufficient for their particular application and requires the applicant to further their efforts in the areas of experience and/or education prior to being enrolled as an LSI or prior to being admitted to the State Specific test for the PLS.

I have some students who have passed the FS and the PS exams from the NCEES who are now being told that

they have not met the education or work experience to be enrolled as an LSI or admitted to the State Specific exam. Obviously, there is some consternation among those individuals who have been surveying for many years and passed their various examinations to be stymied in their efforts at the last step.

In addition to the changes discussed above, within the last year, there was a licensure portability act passed by the Colorado legislature. Although very little has really changed with our requirements, the changes in law resulted in a whole new numbering system of the statutes that apply to licensure as a PLS. That resulted in a whole new rewrite of the Board Rules to reference the updated CRS statute numbers and as a result, the AES Board Rules are all newly numbered, too. So, if you are used to looking in the older documents of CRS and Board Rules such as the excellent last edition Paul Bacus assembled for the PLSC in 2019, the numbers are all changed. Any feedback from the AES Board or staff will be referencing the current numbering system.

To get the current Colorado Revised Statutes on the web, see <https://leg.colorado.gov/colorado-revised-statutes>. When you get to the website, there is a "Click here to access the Colorado Revised Statutes hosted by LexisNexis" note that will take you to the complete CRS. CRS 12-120-310 details the eligibility for an LSI, and 12-120-311 et al details the qualifications for an LSI. CRS 12-120-312 details the eligibility for a PLS, and 12-120-313 et al details the qualifications for a PLS.

You can also access the current Board Rules on the web at <https://dpo.colorado.gov/AES>. Then navigate to Board Rules, and eventually to a screen with a revision effective date of 8/30/2020.

When you are pursuing either the LSI or PLS, be sure to download these sections and following them closely.

Although this article is primarily on the education side of the requirements, a few words on the experience side may be appropriate.

When one examines the language in the law and AES Board Rules, there is reference to progressive work experience and progressive work experience under the supervision of a PLS. It appears that the Board's interpretation of progressive work experience also includes a variety of experience. As an example, they may only count so much of one's construction surveying experience if that is all the applicant has been doing. As another example, although this was prior to the new laws, I have a friend who gained his experience in the San Juan Mountains retracing mining claims, town lots, and other types of surveying. But because the PLSS surveys in that area were suspended in 1892 due to fraudulent surveys, he had very little experience within the PLSS. He had to request a hearing before the Board to demonstrate his knowledge of the PLSS prior to them

granting him his license. Fortunately, they did, since he was my mentor in surveying as I was getting the requisite experience needed at the time I got licensed as a PLS.

While on the subject of the experience side of one's application, the following summary of what the CRS require for admission to either the FS exam or SP exam may be helpful:

Of course, each of those sections in the CRS have a section on reciprocity for those enrolled or licensed in another state that meet the general equivalency of Colorado laws.

Beyond that, for FS exam leading toward LSI enrollment under CRS 12-120-311(2)(b), for those seeking enrollment by graduation and examination,

- (I) The applicant graduated from a board-approved surveying or surveying technology curriculum that is at least four years. or
- (II) The applicant has senior status in a board-approved surveying or surveying technology curriculum that is at least four years.

Note that there is no additional experience requirement under this section.

Under CRS 12-120-311(3)(b) for those seeking enrollment by education, experience, and examination,

- (I) (A) Have graduated from high school or the equivalent; and
  - (B) Have a cumulative record of four years or more of progressive land surveying experience, of which a maximum of one year of educational credit may be substituted, or
- (II) (A) Have graduated from a board-approved two-year surveying curriculum; and
  - (B) Have a cumulative record of two years or more of progressive land surveying experience.

For those seeking admission to the PS exam in route to the PLS license, the experience side of one's application is covered under 12-120-314 and varies depending on the educational route one is using to seek licensure. I'll list the experience portion of each of those routes parenthetically as I discuss the educational component later in this article.

Throughout this article, I will be emphasizing each of you being your own self advocate. This not only involves your application, but your career and education path you choose to reach that stage of application. Look at the experience you are getting. If it is all in one area, request of your supervisors to broaden your experience. If you are working with a company that specializes in one area and the company cannot



comply with a request for a varied background or due to financial consideration (profits) does not have the time to provide you with varying experience, you may need to look elsewhere for that experience if you want to become licensed. I know this is rather harsh but read the law and Board Rules carefully and ensure you can meet all the criteria. When filling out those forms about experience which will be sent to your PLS supervisors for verification, be sure to be complete and include the various areas of experience you have gained.

Now to the education question that started this article. Throughout the article I refer to what is required by Colorado law and AES Board Rules and then pointing out how our programs at WCCC/CMU meet or do not meet those requirements. There are also other schools throughout the United States and even foreign countries that may provide you with the appropriate education. However, the focus of this article is “in my opinion” what the law requires and what the Board Rules require.

**Please recognize, only the Board can make the final determination whether you meet the criteria for enrollment as an LSI or licensure as a PLS or not.**

In general, per Colorado Revised Statutes 12-120-313 et al, the state has 4 educational routes for eligibility for licensure as a PLS:

1. Have graduated from a board-approved surveying curriculum of four or more years. (and have two years of progressive land surveying experience under the supervision of a professional land surveyor.)
2. Have graduated from a non-board-approved surveying curriculum of four or more years. (and have four years of progressive land surveying experience of which at least two must be under the supervision of a professional land surveyor.)
3. Have graduated from a board-approved two-year surveying curriculum or from a four-year engineering curriculum that included surveying course work as specified by the board by rule. (and have six years of progressive land surveying experience of which four years shall have been under the supervision of a professional land surveyor.)
4. Have obtained a bachelor’s degree in a non-surveying curriculum and completed surveying and other related course work, as specified by the board by rule.  
(and have six years of progressive land surveying experience of which four years shall have been under the supervision of a professional land surveyor.)

Each of these, of course, requires enrollment as an LSI and the progressive land surveying experience of various time frames and levels of supervision depending on the route chosen.

The details of these educational requirements are contained within the Board Rules. Since I will be pointing out the connection with these Board Rules and our programs at WCCC/CMU, I must first introduce you to our WCCC programs.

WCCC offers two programs in Land Surveying and Geomatics: An Associates of Applied Science (AAS) in Land Surveying and Geomatics, and a Post Baccalaureate Certificate (PBC) in Land Surveying and Geomatics. For more details of these programs, you can find them on the web with following link:

<https://www.coloradomesa.edu/wccc/programs/land-surveying-geomatics.html> .

If you are looking for other schools that provide Land Surveying and Geomatics education, search the internet for their respective links for their programs.

Now to the Board Rules and the connections with the WCCC programs. Under board rules 1.4G2 – Surveying Education:

- a. Board-Approved Surveying Degree of Four or More Years – refers to the accreditation of ABET/ANSAC or as otherwise approved by the Board.

We do not have a program in Colorado that meets these criteria. One would have to check with other states for such schools. There are several available.

- b. Board-Approved Two-Year Surveying Degree. For a curriculum to be defined as a “Board- approved two-year surveying curriculum” as specified in section 12-120-313(2)(b)(III)(A), C.R.S, the curriculum must contain all the following:

- (1) A minimum of eleven semester hours, or the equivalent, consisting of college-level mathematics. Trigonometry, survey computations, statistics, and/or probability will count toward this requirement. Business math, college geometry and college algebra will not count toward this requirement.

- (2) A minimum of twenty-four semester hours, or the equivalent, consisting of: basic surveying, boundary law, description writing, public land survey system, surveying sciences, surveying practice, ethics, and basic science courses.

The Board has approved our AAS in Land Surveying and Geomatics as meeting these requirements.

We had a bi-annual review in October 2020 and the Board approved the curriculum unanimously.

- c. Board-approved Engineering Degree of Four or More Years. For a curriculum to be defined as a Board-approved engineering curriculum of four or more years as specified in section 12-120- 313(2)(b)(III)(A), C.R.S.

the curriculum must be a minimum of 120 semester hours, or the equivalent, and must contain or be supplemented with, the following course work:

(1) A minimum of eleven semester hours, or the equivalent, consisting of college-level mathematics. Trigonometry, survey computations, statistics, and/or probability will count toward this requirement. Business math, college geometry and college algebra will not count toward this requirement.

(2) A minimum of twenty-four semester hours, or the equivalent, consisting of: basic surveying, boundary law, description writing, public land survey system, surveying sciences, surveying practice, ethics, and basic science courses.

Our Post Baccalaureate Certificate program is designed to meet these supplemental courses unless they were already contained in the specific engineering curriculum. If any were part of the engineering curriculum that meet the criteria such as calculus courses or perhaps a surveying course, these will be transferred over and made a part of the completed requirements for the PBC. During the bi-annual review in October 2020, the Board approved the syllabi for those surveying courses we are offering to meet the (c)(2) requirements. The math for the PBC requires Trigonometry or above, statistics, and analytical geometry or a calculus course. The minimum of eleven semester hours of math are usually covered under the engineering bachelor's degree and transferred over as credits for the PBC. However, if they were not taken with the engineering degree, they are required under the PBC. Depending on which of the optional courses in analytical geometry or calculus are taken, they will go most of the way if not all the way in meeting the supplemental math requirements. If they are slightly shy of the requirement based on the optional calculus class taken, one of the surveying calculations classes could count toward the math, and because there is an extra surveying course in the PBC, the surveying hours would still be met. The Board is not going to, *carte blanche*, state that the PBC meets their educational requirements, but will review the course work of all of one's transcripts including the ones leading to their engineering degree and the transcripts in which the student is gaining supplemental course work to ensure they contain all of the required categories and hours.

d. Bachelor's Degree in a Non-Surveying Curriculum or Non-Engineering Curriculum of Four or More Years. For an applicant to receive credit for a non-surveying or non-engineering Bachelor's Degree of four or more years as specified in section 12-120-313(2)(b)(IV) (B), C.R.S., the curriculum must be a minimum of 120 semester hours, or the equivalent and must contain, or be supplemented with, all the following course work:

(1) A minimum of twenty-two semester hours, or the equivalent, consisting of technological and/or business courses.

(2) A minimum of eleven semester hours, or the equivalent, consisting of college-level mathematics. Trigonometry, survey computations, statistics, and/or probability will count toward this requirement. Business math, college geometry and college algebra will not count toward this requirement.

(3) A minimum of eleven semester hours, or the equivalent, consisting of basic sciences.

(4) A minimum of twenty-four semester hours, or the equivalent, consisting of: basic surveying, boundary law, description writing, public land survey system, surveying sciences, surveying practice, ethics.

Note that our Post Baccalaureate Certificate program fulfills many of these requirements. One must take a close look at the curriculum in which the bachelor's degree was received to verify that the degree contains enough of the technological and/or business courses. This route also takes the basic science out of the 24 semester hours of surveying courses and makes a separate category for it and the transcripts need to be evaluated to verify that this science requirement is also met. Most bachelor's degrees have a certain amount of basic science required and this Board Rule requirement is often met. However, the real area of concern is the 22 semester hours of technological and/or business courses and any shortfalls in science. Many of the BS types of degrees meet these requirements, but several of the BA degrees and a few of the BS degrees may not fulfill these requirements. The Board staff was kind enough to give me an internal Board Memo consisting of 9 pages of courses they are counting as technological or business. Of course, this is 10 years old now. I remind you that **only the Board can make the decision of what courses will count for what.** I find that most science types of degrees meet these requirements, but such degrees as history, literature, fine arts, etc. may not have the supplemental 22 hours of technological or business required and may be shy on the science. For those students, I typically suggest they consider the AAS since most of the general ed, physical ed, and perhaps some science and math courses will be able to be transferred. That leaves them with the common eight surveying courses common to the AAS and PBC, the math classes of Trig, statistics, and calculus (if not already taken), physics, a couple of AutoCAD classes, Cartography, and GIS. When one applies to WCCC for admissions, they must provide their transcripts of any previous education. These will be evaluated by the school to see what courses may be applied to the requisite courses for the programs. Often, those in the Registrar's office reach out to me for my input. Occasionally, I may need to re-evaluate some courses for which the Registrar's office gives credit but as electives to see if any may count instead as one or some of the program requirements. On occasion when a student may have some previous surveying courses

from other schools, I may ask the student to provide me with the syllabi of these courses so that I can compare against our (WCCC's) requirements. There are times that this process is akin to comparing apples to oranges. I make my best decision of what may count for what without overburdening the student with extra courses, while ensuring the student truly gets a proper surveying education. I must also consider how these credits relate to the law and Board Rules as far as hours and categories of education.

As part of our curriculum for both programs, we have certain surveying (SURV) courses taught by our department. The other courses for general education, kinesiology (PE and health), science, math, AutoCAD, cartography, and GIS are given in their own departments. Except for some math requirements, most of the other courses are part of the AAS and not part of the Post Baccalaureate Certificate program.

Of the surveying (SURV) courses, eight are common to both the AAS and PBC. The PBC has one more (ninth) course of SURV 298 – Capstone or Intern course of 4 credit hours. This basically is the final course consisting of a major surveying project agreed upon between the student and the instructor to show that they really do know how to survey.

All nine of the SURV courses are offered in both a campus venue and a distance learning venue, so that we can readily accommodate those that need the education, but still need to work and are not able to travel to Grand Junction for the campus courses. Many of the other courses for the AAS are also available as distance learning but check with each individual instructor to verify whether these are available as distance learning or not. For those that cannot be fulfilled as distance learning from WCCC/CMU, we recommend they be taken at a college or community college near one's home and have the courses transferred upon completion. Because many of the course offerings are on alternate semesters, please check the sequencing of courses so a critical course is not missed that may not be given for another year.

If one is working full time, has family obligations (or at least a social life outside school and work), and is going to school, I recommend that courses be limited to about two classes per semester. The rule of thumb is that for every credit hour of a class, one should be spending 3 hours of work. Hence if one takes two 3-hour classes, there could easily be 15 to 20 hours of extra work on top of a 40-hour to 60-hour work week, and family obligations. I don't want to see the wheels fall off anywhere due to an over commitment, whether that is at school, at work, or with family.

Of course, for those with a bachelor's degree in a non-surveying or non-engineering curriculum of four or

more years, there is no Board rule that you must have the PBC. You just must prove you have successfully completed the course work as stated in the Board Rules. That also means, especially in the area of the surveying requirements, all the categories listed need to be covered. Check the syllabi of the classes you have taken and ensure the syllabi includes descriptions that correspond to the category. As an example, our SURV 206 - Property Law – Boundary Evidence class takes about 1/3 of the semester on the PLSS, while SURV 203 – Legal Aspects of Surveying covers the PLSS in at least two of its chapters over two weeks, and SURV 204 – Real Property Descriptions has one chapter over one week devoted to the PLSS. All told, a little over 1/2 of a semester is spent on the details of the PLSS among all three courses, but the words “Public Land Survey Systems” appears nowhere in the titles of any of the three courses. You must be able to demonstrate to the Board that your coursework covers the PLSS.

My recommendation, of course, is that for those with the non-surveying or non-engineering bachelor's degree, one should minimally complete the PBC rather than cherry pick courses to meet the AES Board's minimum requirement. My goal is to ensure they know how to survey, not just meet the state's minimum requirements. In some cases, those with a few years of experience, but with a non-surveying or non-engineering degree, have been taught by mentors. Many mentors are superb. However, unfortunately a small number are not as knowledgeable in all areas of surveying as they need to be, especially on the boundary law side of surveying.

Now as you personally strive for licensure as a Professional Land Surveyor in Colorado, regardless of which route you take, you need to be your own best advocate on your experience and on your education. As you fill out your experience credentials to send to NCEES and have your PLS supervisor attest, ensure you cover the variety of work you have really done. When it comes to education, review your own transcripts carefully. For those with the non-surveying or non-engineering bachelor's degree, as you evaluate your course work, look for what will fulfill those 22 hours of technological and/or business courses, what will fulfill the math requirements as specified, what will fulfill the science requirements, and what will fulfill the surveying course requirements. One may be only another course or two shy of meeting that requirement or may want to go the AAS route which will count as the approved 2-year surveying curriculum. Also, if you start in the PBC program, you can always switch to the AAS program without losing any credit for the surveying courses you already took. I've had some students with a bachelor's degree in engineering or other technical field but lacked experience in AutoCAD and GIS who chose to go the AAS route anyway to ensure they have full exposure to the full geomatic sciences side of their education.



When it comes time to apply to the Board for your State Specific test for licensure, as your own best advocate, I would recommend you include a letter with table or spreadsheet attachments of your assessments and where your experience and/or education meets what requirement in the Board Rules.

Recognize the early evaluation of your credentials is usually done by staff at the Board, and rightfully so to ensure the Board is not overwhelmed with work. (In reality, the Board is already overwhelmed with work and must rely upon their staff for assistance). Make it easy for them to follow. If they must dig through all of the transcripts and make their own evaluation, they may easily miss something. By providing them with a road map of what you have accomplished in the way of experience and education, hopefully, you will be successful in meeting the requirements. Should you receive word back saying that you still do not have the requisite experience or education, because of the detail you provided, they should be able to respond to your particular shortcomings rather than a general statement of "you need more boundary work" or "you need more education".

Note the Board cannot go outside the bounds of the law or their Board Rules. However, if you have done everything you can to make it easy for them to evaluate your credentials, and you still believe you meet the criteria, you have the option of requesting a hearing with the Board. Your detailed assessment should go a long way in either convincing them that you are qualified, or it should allow them to be quite specific about what additional experience or education you need.

Remember the Board is not your enemy. They have an obligation to protect the public by ensuring licensees are truly qualified. They have certain laws and guidelines they must follow. They don't have the leeway to vary those, because "it is the law". But if you have made an honest assessment of your experience and education credentials, compared that with the laws and Board Rules, and made a professional presentation of your credentials to the Board, I suspect the vast majority of you will have no problem. Like anything in life, the success is in the details and the hard work of getting those details met and presented properly.

Good luck out there!

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# Rule of the Month

## Land Survey Plat - Dimensions and Conflicting Boundary Evidence

Kelly Miller, PLS and Board Member of the Colorado Board of Licensure for Architects, Professional Engineers, and Professional Land Surveyors  
(edits provided by the Board)

In 2017, when the PLSC handed out a book about the size of a small Sears catalog entitled “The Subdivision”. I said to myself, now this appears to be a book that can help any surveyor that wants to broaden one’s knowledge of surveying. This year while attending the 2022 Surveyor’s Summit, I noticed that PLSC had additional copies for sale and I made sure that I picked up a new clean and clear copy. If you could see my old copy on my desk it looks like my 2009 BLM manual with tabs and highlights on almost every page to catch my eye when I am looking for those special items that I can’t seem to remember as well as I used to in my younger years. Yes, you have your normal information that is listed but this publication has so much more. It got me thinking about writing this little reminder that there is much more to a statute than what meets the eye.

The Section 38-51-106 (1)(c), *C.R.S. All field-measured dimensions necessary to establish the boundaries on the ground and all dimensions for newly created parcels necessary to establish the boundaries on the ground.*

Often, I see deposited Land Survey plats, ALTA/NSPS Land Title Surveys, Improvement Survey plats, and Subdivision plats with monuments shown on the plat that were used in the final establishment of the parcel boundary but lacks information regarding how it was used or tied to the final analysis of the boundary. This statutory requirement tells us that **ALL** boundary information and dimensions that were utilized shall be shown on the plat. This regulation is one of the minimum state requirements that all land survey plats shall be included, yet there are so many times this vital boundary information is not provided, and retracing surveyors have to intuit boundary decisions. As surveyors, we are obligated to follow this statute by showing these measurements so fellow surveyors can follow in your footsteps to get to the same location/boundary determination. This will aid retracing

surveyors to either find the reported monument or be able to place a new monument that has been lost. This does not mean that you found two monuments now; it is a cogo exercise to replace the monument per the recorded plat without searching the area for other original monuments to help prove your final decision. We must go into the field hopeful that we will find the original monument. Likely the measurements will vary (sometimes substantially) from the original recorded dimensions. Your survey will be based on the found monuments which represent the corners that were set originally, in the original locations. The reason we go into the field is to locate the original monumentation. It is to find where the property we are surveying was originally represented on the ground, not by its bearing and distance on the plat, this is only to help one find the location that created the parcel. Remember in many old plats especially when located in a mountainous terrain these old surveys were done by chain and transit, or even rumor has it, monuments be set by stadia. The million-dollar question is this, because the property corner was set by stadia and now in the modern day we can measure more accurately, does that change the corner location if the original monument can be found?

Though it is not a statutory requirement, I have found that a Surveyor’s note discussing the derived boundary solution provides much value for retracing surveyors. It also forces you to think about the boundary principles you utilized that resulted in your boundary determination.

I am sure this is all second nature for most of you and you all can do this in your sleep. For those of you that have just started your surveying profession you now have a little better understanding of what is expected of a Land Survey Plat.

### DORA Disciplinary Action Statistics

	ARC	EI	PE	LSI	PLS	Unlicensed
Complaints Received 1-1-2022 through 5-31-2022	40	5	110	5	14	2

Architect (ARC), Engineering Intern (EI), Professional Engineer (PE), Land Surveying Intern (LSI), Professional Land Surveyor (PLS)

Cases Closed Complaints DORA received Calendar YTD	Dismiss	CLOC*	LOA**	Stipulation	Revocation	Voluntary Relinquishment	Injunction
Architect	19	10	3	5	1	3	1
Professional Engineer	24	46	4	3	0	0	0
PLS	6	2	1	2	0	0	0

\*CLOC closed complaints, \*\*LOA Letter of Admonition

	ARC	PE	PLS
Number of Settlement Judgements	9	27	2

Groups of Discipline

Final Action	Violation 1	Violation 2	Violation 3	Violation 4	Violation 5	Violation 6	
Letter of Administration Stipulation	(1)12-120-306(1)(m)Practicing on an Expired	1.6 Rules of Professional Land Surveying Practice A. Sealing Requirements for Professional Land Surveyors 2. Seal Application: Pursuant to section 12-120-316, C.R.S., the professional land surveyor's manual or electronic seal must be applied to either the final reproducible, the final reproduction, or the final electronic record document of any of the following being delivered to the public: a. Each sheet of documents and plats resulting from the practice of land surveying. 1) An electronic seal on the cover page(s) of documents and plats. (b) The cover page(s) shall contain the identical sheet border, title block and project title as the remaining pages of the set of drawings. When opting to seal only the cover page(s) of documents and plats, a notation shall be included in the title block of every page noting that all seals for the documents or plats are applied to the cover page(s) (b) Each sheet of documents and plats shall be numbered, including the cover page(s). (c) Electronic seals affixed to the cover page(s) of documents and plats must adhere to all requirements of Board Rules, including a statement of the scope of work and, if relevant, page numbers associated with the scope. (d) If electronically sealing on the cover page(s), Signature Dynamic Technology shall be used. b. The title page(s) or signature page(s) of surveying reports.	1.6 Rules of Professional Land Surveying Practice B. Land Surveyor's Certification 2. Certification Defined. Certification shall include the following: a. Is signed and/or sealed by a professional land surveyor representing that the surveying services addressed herein have been performed by the professional land surveyor in responsible charge. b. Is based upon the professional land surveyor's knowledge, information and belief. c. Is in accordance with applicable standards of practice. d. Is not a guaranty or warranty, either expressed or implied.	1.6 Rules of Professional Land Surveying Practice E. Standards for Land Surveys 4. Monuments Shall Conform to Statutes. The professional land surveyor will assure that the monuments established or re-established conform both in location and physical character with the specifications called for in section 38-51-104, C.R.S. Each found monument verified in location shall be restored or rehabilitated as necessary so as to leave it readily identifiable and reasonably durable. Physical standards for Public Land Survey System monuments can be found in Board Rule 1.6(D). a. Documenting New and Existing Monuments. If a monument is set, as a result of a land survey, that represents the same corner or control corner of an existing monument, the professional land surveyor setting the new monument shall, on the resulting land survey plat, make note of the reason the professional land surveyor did not accept the existing monument.	1.6 Rules of Professional Land Surveying Practice B. Land Surveyor's Certification 2. Certification Defined. Certification shall include the following: a. Is signed and/or sealed by a professional land surveyor representing that the surveying services addressed therein have been performed by the professional land surveyor in responsible charge. b. Is based upon the professional land surveyor's knowledge, information and belief. c. Is in accordance with applicable standards of practice. d. Is not a guaranty or warranty, either expressed or implied.	E. Standards for Land Surveys The licensed professional land surveyor shall conduct or be responsible for conducting such research activities that are needed to properly define the property boundary relative to instruments of record and show all visible evidence that may affect ownership and property rights. This may include record research at the County Clerk and Recorder's Office, the Colorado Department of Highways, the State Office of the Bureau of Land Management, the County Surveyor's Office, an abstracter's office, and any other appropriate local offices; as well as field research of physical features and monuments and any other features significant in the locality. Instruments of record may be obtained from an abstract, title commitment, or title policy.	H. Basis of Hearing Statements. Section 38-51-106(1)(e), C.R.S., requires professional land surveyors to include an explanatory statement concerning the basis of bearings, if used, on their land survey plats.
Stipulation	(1)12-120-306(1)(d) Failing to meet the generally accepted standards of the practice of land surveying through act or omission;	38-51-104. Monumentation of land surveys. (1) (a) The corners of lots, tracts, other parcels of land, section, and any line points or reference points which are set to perpetuate the location of any land boundary or easement shall, when established on the ground by a land survey, be marked by reasonably permanent markers solidly embedded in the ground.	38-51-106. Land survey plats. (1) All land survey plats shall include but shall not be limited to the following: (b) (I) All recorded and apparent rights-of-way and easements, and, if research for recorded rights-of-way and easements is done by someone other than the professional land surveyor who prepares the plat, the source from which such recorded rights-of-way and easements were obtained; (II) If the client wishes not to show rights-of-way and easements on the land survey plat, a statement that such client did not want rights-of-way and easements shown; (c) All field-measured dimensions necessary to establish the boundaries on the ground and all dimensions for newly created parcels necessary to establish the boundaries on the ground; (f) A description of all monuments, both found and set, that mark the boundaries of the property and of all control monuments used in conducting the survey. If any such boundary monument or control monument marks the location of a lost or obliterated public land survey monument that was restored as a part of the survey on which the plat is based, the professional land surveyor shall briefly describe the evidence and the procedure used for such restoration. If any such boundary monument or control monument marks the location of a quarter section corner or sixteenth section corner that was established as a part of the survey, the professional land surveyor shall briefly describe the evidence and procedure used for such establishment, unless the corner location was established by the mathematical procedure as outlined in section 38-51-103.	1.6 Rules of Professional Land Surveying Practice B. Land Surveyor's Certification 2. Certification Defined. Certification shall include the following: a. Is signed and/or sealed by a professional land surveyor representing that the surveying services addressed therein have been performed by the professional land surveyor in responsible charge. b. Is based upon the professional land surveyor's knowledge, information and belief. c. Is in accordance with applicable standards of practice. d. Is not a guaranty or warranty, either expressed or implied.	E. Standards for Land Surveys The licensed professional land surveyor shall conduct or be responsible for conducting such research activities that are needed to properly define the property boundary relative to instruments of record and show all visible evidence that may affect ownership and property rights. This may include record research at the County Clerk and Recorder's Office, the Colorado Department of Highways, the State Office of the Bureau of Land Management, the County Surveyor's Office, an abstracter's office, and any other appropriate local offices; as well as field research of physical features and monuments and any other features significant in the locality. Instruments of record may be obtained from an abstract, title commitment, or title policy.	H. Basis of Hearing Statements. Section 38-51-106(1)(e), C.R.S., requires professional land surveyors to include an explanatory statement concerning the basis of bearings, if used, on their land survey plats.	



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# Follow up: Are Satellite Based Correction Services the “Next Utility” For Surveyors? Continued, Updated and Forecasted!

By: Bob Green, PLS

## Recap from 2021

This time last year I had an article published in the May/June issue of “The American Surveyor” Magazine entitled Are Satellite-Based Correction Services the “Next Utility” for Surveyors and Measurement Professionals?

<https://amerisurv.com/2021/06/20/are-satellite-based-correction-services-the-next-utility/> .

Due to the constraints of publisher and publicist recommendations, including length of article, I was limited on content and composition. In February, at the 12th Annual Rocky Mountain Survey Conference, I was approached by Steven Parker. As Editor of Side Shots Magazine, he asked if I could provide follow-up articles to my American Surveyor endeavor.

I agreed, and thus this article. Hopefully this will provide additional insight, subject to my testing and evaluations as a surveyor. Over the past decade or so, I have realized that manufacturer product datasheets, white papers and press releases can be extremely informational. However, in many cases the statistics incorporated can be vague and unintentionally difficult to interpret. The licensed surveyor needs to certify to precision specifications and standards that are not necessarily sufficiently clarified in marketing material. Some may say “Bob, you represent, market, and sell manufacturers products, why be critical?”

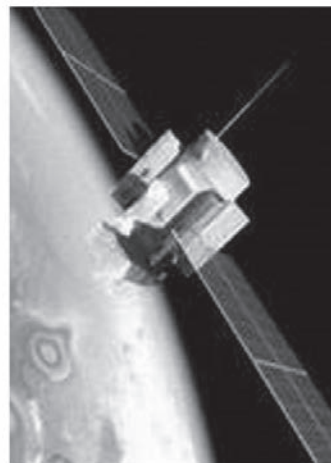
As many of you already know, I am a surveyor way before a salesman. In my position as Geospatial Analyst at Frontier Precision, it is a part of my job to evaluate GNSS, terrestrial and various sensor data. This gives me a unique opportunity to interface with products and solutions, in many cases, prior to their final release.

In my American Surveyor article I touched on some of my professional history. Having started my career surveying with a transit, alidade, plane table, steel tape and Philly rod in the 1970’s, I have witnessed firsthand many technology enhancements. In the article I refer to them as “Game Changers”.

These include the advent of Real Time Kinematic surveying transitioning to real time networks and VRS technology. I end the article with Precise Point Positioning (PPP) and SBAS solutions. Let’s start there.

## GNSS Satellite Constellation Update

Before transitioning to SBAS, PPP and RTX technology, you are only as strong as your weakest link. The term GNSS (Global Navigation Satellite System) has gained industry acceptance over the last decade or so. Trimble adopted the acronym with the release of Survey Controller 12.00, the precursor to Trimble Access. This multi-constellation inclusion is no longer esoteric in nature but instead well published. At first, I was highly critical of Trimble’s adoption of Russian GLONASS in the R8 Model 2 around 2004. I remember giving a presentation and referring to GLONASS satellites as “Russian trash cans in space” (that did not go over very well by the way). Advocates would boast that Russia could launch 3 satellites per rocket unlike GPS that only launched one satellite per rocket. It was my belief that Russia launched three hoping one would stay in orbit.





With that said, a lot has changed after the country of India got involved through meetings between then Russia's President Putin and India's Prime Minister Singh starting in December 2005. Since then, the GLONASS constellation has become much more robust and reliable. Other GNSS Constellations like European GALILEO, Chinese BeiDou, Japanese QZSS and India's IRNSS are at varying stages between Initial Operational Capability (IOC) and Final Operational Capability (FOC). My topic for the "virtual" portion of the RMSS 2022 was GNSS Modernization "New Signals in Space". I realized that the availability of this session through PLSC ended in March. So, we created a YouTube link exclusively for Side Shots readers. For more information on this topic see: <https://frontierprecision.com/space/>

Over the past several years my testing has changed my opinion of the GNSS interface. Trimble's new Positioning Engine ProPoint is clearly a "Game Changer". This new engine exceeds that of its predecessor HDGNSS and is far removed from the legacy L1 float/fixed solutions of the past. The ProPoint algorithm requires full GNSS for peak performance. Additionally, manufacturers in general including Trimble have tracking stations globally. By using full GNSS Trimble has developed orbital, ionospheric and tropospheric models that challenge those of IGS. This enhanced data is available in TBC when processing baselines under Internet Download/GNSS Correction Services/Trimble RTX Corrections. For non-Trimble users this data is available through Trimble "OPUS" at [www.trimble.com](http://www.trimble.com). It is free to use and for the most part manufacturer agnostic. Accordingly, if OPUS is down or your report comes back with a error message try this service. One hour of data is required. So, the weak link in today's market is GNSS compliant correction sources. Trimble RTX and VRS Now are currently incorporating full GNSS. Keep in mind that QZSS is a figure 8 quasi-zenith orbit constellation over the Asia-Oceania region covering Japan and Australia. Occasionally, on the extreme West Coast of the USA you may track one QZSS SV. In Colorado, you do not need to enable the constellation in your Survey Style settings. The same goes for IRNSS (NavIC) as the constellation is geostationary over the country of India and surrounding regions.

## Precise Point Positioning (PPP) and Trimble CenterPoint RTX (Real Time Extended)

Although my American Surveyor article focused on L-Band CenterPoint RTX FAST satellite-based correction delivery, internet-based corrections are readily available as well. Just like L-Band, the service provides centimeter horizontal corrections throughout the Continental United States into Southern Canada This IP correction service enhances the performance of RTX in challenging environments. However, the downside is that cell link is required. As mentioned above, full GNSS plus ProPoint are the



keys to success in both accuracy and rapid convergence/initialization times. As depicted in my article, defaulting to Trimble's legacy precision display

of DRMS HZ/1 Sigma VT, I am consistently achieving precisions as shown. Although somewhat hidden, at the bottom of the UNITS screen in Trimble Access (version 2020 and up) a user can toggle between the precision displays of DRMS, 1 Sigma, 95% and 99% confidence. This is huge when a job requires certain specification such as ALTA standards of 2cm +50 PPM @ 95%. These later versions of Access also incorporate a 14-parameter time dependent transformation (TA 2020.00). Hopefully this will set us up for success in the future, especially regarding RTX. The final piece to the puzzle was in the incorporation of deformation models. The 14 Parameter time dependent transformation adopted in TA 2020.00 resolved the 1.4 meter +/- offset between the current epoch of ITRF 2014 (RTX) and NAD 83 (2011) Epoch 2010. However this transformation did not compensate for seismic activity. This resulted in 0.12'-0.15' deviations from published NGS control and/or OPUS Report values. Thus, a RTK to RTX offset or Site Calibration still had to be performed in the field. Then in TA V. 2020.20, Trimble incorporated the same deformation model as used by the National Geodetic Survey, the Horizontal Time Dependent Positioning utility (HTDP) V. 3.2.9. This was the final piece to the RTX to NAD 83 puzzle. I was however concerned about how TA software would keep up with the ever-changing HTDP Model. The recently released TA 2022.00

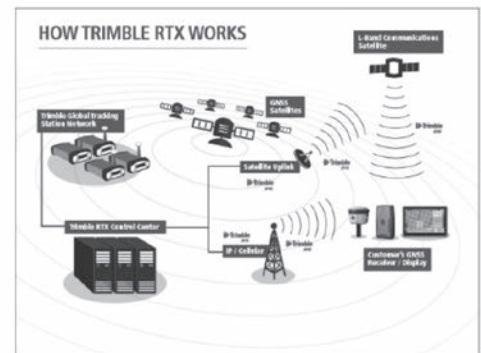
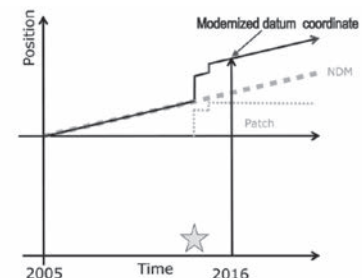



Figure 1 Schematic diagram of a dynamic datum. Heavy dashed gray line shows the secular velocity. Yellow star indicates an earthquake. Thin gray dotted line co-seismic contribution the deformation model. The solid black line shows the deformation model with both contributions combined

now incorporated HTDP 3.4.0, the same as NGS. In Colorado, the impact of these version updates is not as impactful as it is on the West Coast. With that said, when using RTX it is extremely important to maintain firmware warranty on your controller/Trimble Access. These HTDP files are located (Windows 10) in C:\ProgramData\Trimble\Trimble Data\htdp\_v3.4.0\_20211019.xml and plate\_rotations\_from\_htdp.xml.

## RTX Statistics and Reporting

As surveyors, I believe we perform a particular workflow and use the same “settings” day after day. Why? Because they work! When in practice I was guilty of this as well. RTX is somewhat different than traditional RTK. With RTK when you observe a point and download the data you can view a resultant vector (the blue lines on your TBC screen).

Statistics	
Maximum PDOP:	2.732
Maximum HDOP:	1.061
Maximum VDOP:	2.526
RMS:	?
H. precision (DRMS):	0.011 ft
V. precision (DRMS):	0.026 ft
Observed Data	
Number of satellites:	10
Number of epochs:	190
RTCM age:	2.000
Geodetic azimuth:	317°26'13.1"
Ellipsoid distance:	21313.871 ft
Δ Height:	730.614 ft
Solution type:	RTK
Field method:	Observed Control
ΔX:	-7197.046 ft
ΔY:	16760.875 ft
ΔZ:	11053.354 ft

When the vector is selected its properties can be viewed as shown. These include Position, Horizontal and Vertical Dilution of Precision values and precision values at the selected confidence level. Although the Observation Data Geodetic azimuth, Ellipsoid distance or the Earth-Centered, Earth-Fixed GNSS Base to Rover deltas are not available with RTX, the statistics can be obtained and modified. Typically, when I set up a “Survey Style”, under my point settings I choose Quality Control QC1 and QC2. Why? Because that’s the way I’ve done it for 30 years! Over the past 3 years, when using RTX and sometimes RTK I choose QC1 and QC3. Why? QC2 is your variance/covariance (VcV in Trimble’s world) statistics. This unbiased statistical data with the diagonal being the variance or X, Y, Z sigma squared and the offsets being the covariance or correlation values.

I’ve always logged this data just in case I wanted to perform a Network Adjustment. However, at least today, RTX data can be calibrated, localized, and transformed but it cannot be adjusted. So, why am I logging it! Instead, QC3 contains local tangent plane sigma north, east, and up (elevation) along error ellipse components and unit variance. To me, this option is far more valuable with RTX than the VcV in QC2. This data can be obtained through a “Survey Report” that can be directly exported from Access.

Point	TEST 3	RTX X	-1459656.733	RTX Y	-5014048.954	RTX Z	3653185.400	Code	95% CONFIDENCE TEST
		Method	RTX Fast	Type	Observed control point	Search class	Normal		
Antenna height	2.000	Type	Uncorrected	Hz Prec (95%)	0.013	Vt Prec (95%)	0.038		
QC 1		PDOP	1.0	GDOP	1.6	HDOP	0.5	VDOP	0.9
		Base data age	7	Satellites	29	Positions used	235		
QC 2		VcV xx (m <sup>2</sup> )	0.000042	VcV xy (m <sup>2</sup> )	0.000059	VcV xz (m <sup>2</sup> )	-0.000046		
				VcV yy (m <sup>2</sup> )	0.000251	VcV yz (m <sup>2</sup> )	-0.000154		
						VcV zz (m <sup>2</sup> )	0.000135		

Point	505	RTX X	-1459648.709	RTX Y	-5014049.803	RTX Z	3653184.354	Code	
		Method	RTX Fast	Type	Topo point	Search class	Normal		
Antenna height	5.000	Type	Uncorrected	Tilt distance	0.277	Hz Prec (95%)	0.023	Vt Prec (95%)	0.082
QC 1		PDOP	1.0	GDOP	1.8	HDOP	0.6	VDOP	0.8
		Base data age	9	Satellites	23	Positions used	9		
QC 3		σ North	0.010	σ East	0.009	σ Elevation	0.042	Covariance	0.000
		Semi-major axis	0.010	Semi-minor axis	0.009	Orientation	?	Unit variance	1.000

In closing, perpetuation of RTX solutions is an issue but can be handled in multiple ways. Perhaps a topic for another conversation. RTX as a platform will continue to improve, thus challenging Real Time Networks. Therefore, I am predicting that VRS, in the near future, will offer sub-centimeter subscriptions. Hardware platform will continue to evolve, fascinate, and interweave with integrated technologies becoming the backbone of measurement science moving forward.

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# United States Department of the Interior



BUREAU OF LAND MANAGEMENT  
Colorado State Office  
2850 Youngfield Street  
Lakewood, Colorado 80215-7210

In Reply Refer To:  
CO-956  
9650

June 22, 2022

Steven Parker and Laine Landau, Side Shots Co-Editors  
PO Box 441069  
Aurora, Colorado 80044

Dear Mr. Parker and Ms. Landau:

This letter informs you of official BLM cadastral surveys in Colorado that have been accepted from February 25, 2021, through April 28, 2022, officially filed, and are now available in the Public Room, Bureau of Land Management, Colorado State Office, 2850 Youngfield Street, Lakewood, Colorado 80215. The surveys will also be available at <https://gloreCORDS.blm.gov>.

The accepted surveys are listed below by township, range, meridian, group number, type, approval date and number of plats.

<u>Township</u>	<u>Range</u>	<u>Meridian</u>	<u>Group No.</u>	<u>Type</u>	<u>Approved</u>	<u>Plats</u>
T. 48 N.	R. 8 E.	NMPM	1726	Plat Only	02/25/21	3
T. 8 S.	R. 71 W.	Sixth	1719	Plat Only	03/16/21	3
T. 13 S.	R. 86 W.	Sixth	1729	Plat Only	03/24/21	2
T. 8 S.	R. 71 W.	Sixth	1500	Plat Only	03/31/21	1
T. 51 N.	R. 8 E.	NMPM	1738	Plat Only	05/03/21	2
T. 49 N.	R. 9 E.	NMPM	1500	Plat Only	05/20/21	3
T. 9 S.	R. 70 W.	Sixth	1718	Plat Only	09/10/21	2
Tps. 41 N.	Rs. 7&8 W.	NMPM	1684	Plat Only	09/24/21	1
Tps. 42 N.	Rs. 7&8 W.	NMPM	1684	Plat Only	09/30/21	2
T. 19 S.	R. 73 W.	Sixth	1716	Plat Only	09/30/21	2
T. 49 N.	R. 8 W.	NMPM	1749	Suppl. Plat	11/02/21	1
T. 28 S.	R. 70 W.	Sixth	1727	Plat Only	11/16/21	2
T. 8 N.	R. 73 W.	Sixth	1728	Plat & Notes	12/01/21	1
T. 50 N.	R. 8 W.	NMPM	1720	Plat & Notes	12/16/21	1
T. 5 S.	R. 72 W.	Sixth	1730	Plat & Notes	12/29/21	1
T. 10 N.	R. 85 W.	Sixth	1731	Plat Only	01/18/22	2
T. 4 S.	R. 75 W.	Sixth	1733	Plat & Notes	02/09/22	1
T. 1 N.	R. 78 W.	Sixth	1551	Plat Only	03/18/22	9
T. 6 N.	R. 81 W.	Sixth	1740	Plat & Notes	03/31/22	1
T. 9 S.	R. 78 W.	Sixth	1742	Plat & Notes	04/28/22	1

As other surveys are completed, I will advise you of their acceptance. You may circulate this letter among the membership of the Professional Land Surveyors of Colorado.

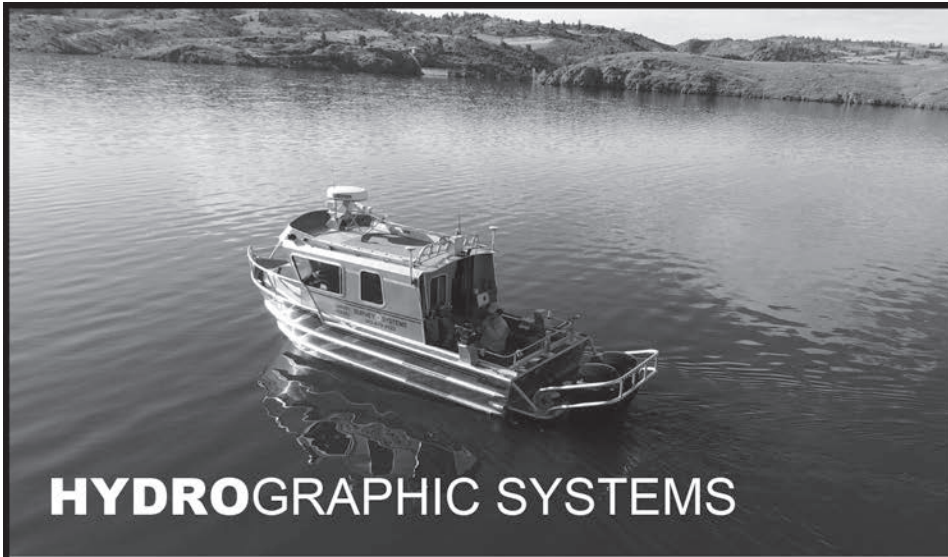
Yours in Service,

JANET WILKINS Digitally signed by JANET WILKINS  
Date: 2022.06.22 17:32:17 -0600

Janet Wilkins  
Chief Cadastral Surveyor for Colorado

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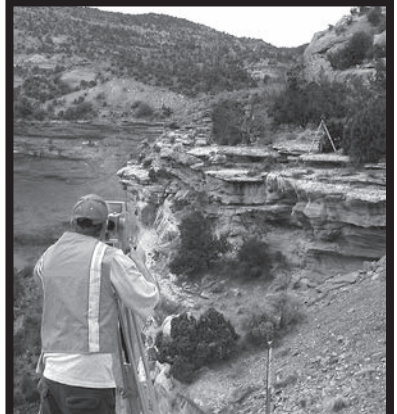
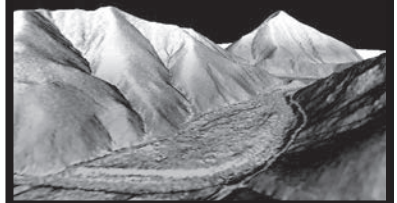
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# WOMEN IN SURVEYING

## Teresa Smithson, PLS

I was pleased to discover that PLSC is doing a series in Side Shots highlighting women within the land surveying profession. I am honored that Robert Boehm asked me to write about my experiences as a female in this field. Being a land surveyor means a great deal to me, and I consider my colleagues as family. But like any family it has its ticks, its uncomfortable relationships, and its adventures and thrills, enhanced by being a female in a male dominated field.

My introduction to gender issues and expectation differences started long before my entrance into surveying. It hit home when, at 16, I placed at the 99th percentile in math on the ACT college exam. My school counselors recommended I become a math teacher – engineering never being a consideration for a *girl*. It didn't take long to figure out that was a bad choice. Some years later I was looking for a career change from accounting and someone recommended land surveying. I found the program at the Denver Institute of Technology and fell in love with the combination of mathematics and outdoor work.

After graduating from DIT in '97, I paid my dues with seasonal work – BLM cutting brush and running section lines in the San Juan Mountains, summers working only for small surveying companies, and traveling to Utah and Oklahoma to stay employed. All the while I had additional obstacles to employment that my colleagues did not have to overcome like:

- Daily filthy jokes just to see if I could “make it in a man's world”. Jokes that my husband was offended by.
- Being told by a colleague that they wouldn't hire a female because “where would she pee”? Isn't that what the truck is for if no other barriers are available?!
- Having my party chief point out to me that he is marrie. The implication being that I'm only looking for a man?!

These stories may seem funny now, but they are examples of real barriers to diversifying our profession. Why diversify? Homogenous workforces provide homogenous problem solving, which makes our profession less innovative and less competitive and with the attrition in our industry we need to be encouraging more people of all kinds to join the profession.

Fortunately, having met so many fantastic people in this profession, especially the other women who I came to look up to, such as Diane Askew and Peggy Streicher, I knew these instances were the exception and not the rule. I was not to be deterred!

So, in 2001, I passed my LSI exam and then in 2003 I passed my PLS exam. But I have never done well being content with the status quo. My husband and I joke that he takes care of the maintenance and I am in charge of creating chaos. In 2004 I earned my MS in Environmental Engineering from Colorado School of Mines. In 2007 I took a job in Iraq and then went to Afghanistan in 2011. In 2013 I earned an MS in Geospatial Engineering from Texas A&M along with GISP and RICS certifications, while still working in Afghanistan. I finally came back to the States at the end of 2015 to work for Jacobs, where I am still employed. After joining Jacobs, I was able to expand my career to do more GIS and database work, including doing a study of vehicle-wildlife collisions that will be used to inform planning and design of highway crossing structures that are tailored to specific animal needs and migration patterns.



I continue to love this profession and the wider venue of the geospatial sciences. By affording me the chance to work overseas I got to be shot at, have bombs whistle over my head, lose a friend, fly around on helicopters and Russian airplanes, and visit over 23 countries. But my most memorable moments were:



- Running across the tarmac to an impatient Blackhawk helicopter. As I ran in 100 plus temperatures carrying all my survey and personal gear for a two-week trip to another camp I noticed how much my feet hurt. Upon my return to home base I weighed all my gear – 115 pounds, almost as much as I weighed at the time. I took my steel chest plates to the supply warehouse and demanded ceramic chest plates – they are 20 pounds lighter.

- Reinventing the survey department to support troop drawdown by utilizing GIS to produce maps of assets; saving the jobs of me and my colleague for another year. Skills that have allowed me to redirect my geospatial career as I've become unable to meet the physical surveying demands.

- Climbing the Great Ziggurat of Ur, built in the 21st century BC, and walking the city of Ur in amazement of the architecture and cuneiform writing.

- Sitting on the tarmac in a Russian plane with no air conditioning (100 plus outside), because there wasn't enough power, and watching the flight attendant/mechanic inspect the plane with a roll of duct tape – and yes, he was known to use it!

- Flying on Blackhawks, Chinooks, small and large turbo props; landing in remote outposts on various surfaces; waiting for days at air strips hoping the dust storm would clear; and riding in Humvees and MRAPS.

- Best of all, the friends and comradery that only such a place can create.

Throughout my career, I continue to meet fantastic people and jerks – like the party chief in Iraq who truly had a hatred for women and told me to shut up and have no opinion. Those who know me know that this is not possible. I have come to realize that such people are small inconveniences. My advice to other women is to seek out the true professionals. Not to get help or advice, but just as a validation that you are where you belong and that the jerks don't really matter. My advice to my male colleagues is best summed up by something I heard – “It's not what your first thought is that matters, it's what your 2nd thought is”. There are so

many of you who have supported me and encouraged me, I fear to leave out someone important if I tried to make a list. So, my thanks to the many colleagues that made me feel that I belonged, it allowed me to not be deterred.



# PLSC Board of Directors

## Meeting Minutes

### May 18, 2022

1. Call to Order: Pettit

Name	Position	Chapter	Attending?
Ralph Pettit	President	Central	
Brian Dennis	Vice President	Southern	x
Shaun Lee	Secretary/Treasurer	Central	x
Becky Roland	Executive Director	n/a	x
Heather Lassner	Director	Northern/TrigStar	
Eric Carson	Director	Central	
Brian Bowker	Director	Western	
Ian Cortez	Director	Central	x
Todd Johnston	Director	Southwestern	x
Eric White	Director	Southern	
Tom Sylvester	Director	Western	x
Scott Thompson	Director	Western, Legislative Co-Chair	x
Steve Parker	Ex-Officio	Central	
Parker Newby	Non-Voting	Southwest	
Todd Beers	Non-Voting	NSPS/WFPS Delegate	
Guests:			
John Hunter		Geo-Coordinator	
Peggy Streicher		GIS in the Rockies	
Derek Brown		Central Chapter	x
David Berglund		Northern Chapter	x
Willie Whelen		NW ¼ Chapter	
Brian Shaw		NOAA/NGS	x
James Combs		YSN	
Cole Conger		YSN	x

2. Determined a Quorum (6 voting), Lee

3. No changes to the Agenda, Pettit

4. Consent Agenda

- a. BOD Discussed benefits/concerns of consent agenda
  - i. Post reports one week prior to meeting
  - ii. Becky would summarize submissions in packet and send to Board and Stakeholders one week prior to the meeting
  - iii. Consider BOD Meeting every other month with Working Group on the off months if there is a topic
  - iv. Note that BOD can vote via email in between meetings

MOTION: To try the Consent Agenda for the next two BOD meetings. SL/IC  
Approved unanimously

MOTION: To move to a bi-monthly format for BOD Meetings (July) with Working Group (June). IC/SL  
Approved unanimously

- v. Next Working Group Meeting will be on Scholarship on June 14 at 4:30pm

5. Approve March Minutes, Pettit

MOTION: To approve the March 2022 Minutes as presented. ST/IC

Approved unanimously

6. Financial Report, Pettit/Lee/Roland

- a. Investments: \$301,007 Checking: \$50,195 Savings: \$62,850
- b. Executive Committee meeting next week to finalize draft budget for the Board

7. Side Shots Report, Parker

- a. BR post TS's article in next Side Shots and post to website and email to membership

8. Project Updates

- a. Colorado Railroad Museum Project, Lee/Brown
  - i. SL will physically stop by and take boxes back after scanning and try to get an update
- b. Adams County, Cortez/Berglund/Lassner
  - i. Met with Deputy Clerk on Mar 30
  - ii. IC has data but work has to be done within Adams County (no volunteers)
  - iii. Plan B: IC creates site similar to Weld County but staff expansion is not until next year
  - iv. Likely any county will have this same requirement of employee only
- c. CO/NE Project, Boehm/Cortez
  - i. NSTR

9. Reports

- a. WCCC Update/Scholarship Committee, Sylvester
  - i. Finals last week and this week
  - ii. 2 graduates this semester/up to 8 next semester likely
  - iii. No new scholarship applications – WCLS may have a scholarship to jointly present with PLSC
  - iv. TS will put together additional information for WG in June
- b. GIS in the Rockies, Streicher
  - i. NSTR
- c. Colorado Coordinator Activities, Hunter
  - i. No report
- d. Lobbyist/Legislative Committee, Thompson/Pettit

- i. Legislation is over for this year
    - ii. Lobbyist presented report in May Side Shots
    - iii. Exemption for licensure portability (listed as such in bill)
    - iv. Successful in changing real estate closing form requirements
    - v. Article sent to realtors explaining the different surveys for DORA forms – ST to send the link to BR to disseminate
  - e. Membership Committee
    - i. Numbers included in packet
  - f. Outreach Committee, Dennis
    - i. BD presented at Realtors/Title Co conference about various types of surveys – presenting to Remax office in Colorado Springs tomorrow – BD will share documents when finalized
  - g. Education Committee, Johnston/Bowker
    - i. RMSS
      - 1. Met to start work on 2023 Summit
      - 2. Have new members on committee
      - 3. Four day conference 2/21-24/2023
      - 4. 3 hours education/2 hour lunch/3 hours education
      - 5. Three tracks – Professional/Business Technical
      - 6. Dane Corville and other local speakers being invited
      - 7. TJ/RP will finalize article on 2022 summary for Side Shots with photos – BR to add photos to Google drive from Dropbox
  - h. Trig Star Committee, Lassner
    - i. TS had 7 students on Western Slope – BB TS presented certificates to participants and awarded \$100 to winner
  - i. CST Committee, Parker
    - i. No report
    - ii. CST program is a great prep for LSI
    - iii. BR to get report/numbers from NSPS for next meeting
    - iv. DORA (What topics are on state specific? Is there a practice test?) for PLS/LSI State Specific
  - j. NSPS Delegate Report, Beers
    - i. No report
  - k. WSPS Delegates' Report, Beers
    - i. Emailed report to Board previous to meeting
    - ii. Consider survey of members for what they value with PLSC
  - l. NSPS YSN, Conger
    - i. NSTR
  - m. QBS Update, White
    - i. NSTR
  - n. Chapter Reports
    - i. Southern, Parker
      - 1. New directors to be installed
    - 2. Brian Shaw presented last meeting
    - 3. Golf Tournament in August
  - ii. Central, Brown
    - 1. Golf Tournament coming up and turnout is good
    - 2. Possible Clay Shoot in Fall
    - 3. July is next member meeting
    - 4. Looking for special projects
  - iii. Northern, Berglund
    - 1. Met May 4
    - 2. Hiatus over summer
    - 3. BOD positions – will recruit
    - 4. DORA Monument record delay – discussed at meeting
    - 5. Setting up committee to assist smaller counties with scanning records
    - 6. Considering GPS on Benchmarks event in summer with other chapters
  - iv. NW ¼, Whelen
    - 1. No report
  - v. Southwestern, Johnston
    - 1. Met March 22 and posted report in Side Shots
    - 2. Interested in GPS on Benchmarks in summer
    - 3. Next meeting June 28
  - vi. Western, Bowker
    - 1. Working on seminar for September 9 or 16 – Rules of the Road (Beckwith Peterson)
    - 2. Upcoming scholarship
10. Action Items from previous meetings
- a. Becky Roland will send amended MOU to NSPS Foundation for acceptance before sending to Ralph Pettit for signature.
    - i. Awaiting NSPS Foundation response
  - b. BOD would like to discuss future scholarship award amounts at an upcoming meeting or at a special meeting. Consider award based on credit hours and expanding to cover other education like CFedS/RMSS. Set a working group meeting for this with Board Members (June meeting). TS will put together information for consideration.
  - c. BR to revise the PLSC website to clarify that residency in Colorado is not required for scholarship.
    - i. Completed
  - d. CO Real Estate Journal has invited PLSC to write an article on the difference between ILC and Land Survey Plat (ST working on article for review)
  - e. LTAC – asked PLSC to update webinar
  - f. Need to select new chairs for 2024 Summit
11. NGS Update, Shaw
- a. NGS webinar last week
  - b. Elevations Geospatial Summit was last week



- c. Presented to Southern Chapter
- d. Good video on preserving control - <https://www.youtube.com/watch?v=4y0jNRkGul8>
- e. Video on GGOS and Geodesy  
[https://www.youtube.com/watch?v=Jwqz097N2IY&list=PLIIfsJS7iAuxXGqq0YLAUO\\_m\\_06za9vqr&index=3](https://www.youtube.com/watch?v=Jwqz097N2IY&list=PLIIfsJS7iAuxXGqq0YLAUO_m_06za9vqr&index=3)

- ii. RP thanked BD for keeping him informed
- b. Budget Update, Lee/Roland
  - i. Meeting next Thursday – then draft to BOD
- c. DORA Monument Record Filing Delay, All
  - i. DORA expects to address backlog in the next 4-6 months
  - ii. SL reviewed Stakeholder meeting notes schedule – will share recording link

12. New Business

- a. NSPS – Davis-Bacon Act Update, Roland/Dennis
  - i. NSPS filed comments May 17 with Dept. of Labor – copy sent to Board

13. Adjourn ST/TJ





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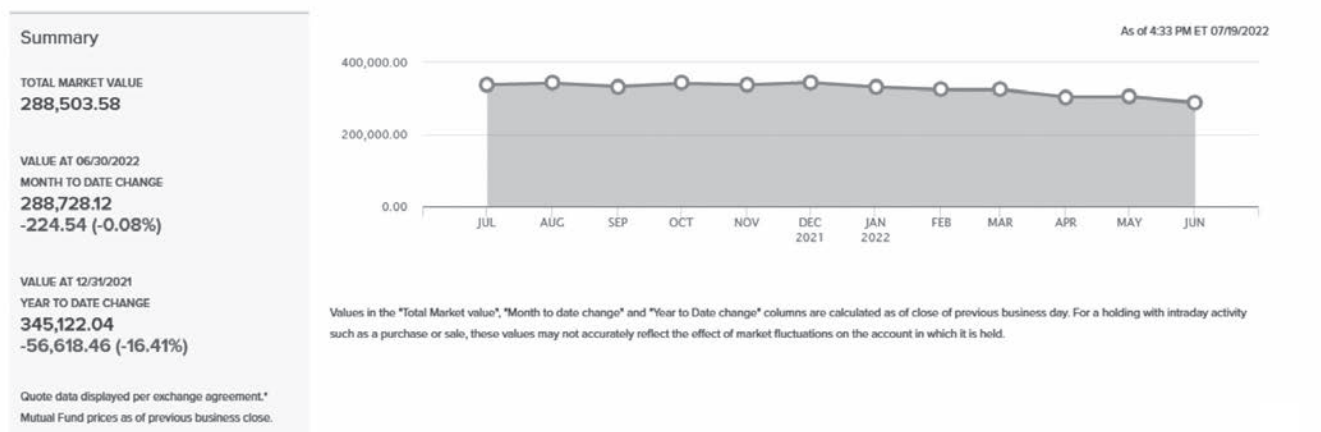
Email [bryan@air-craft.us](mailto:bryan@air-craft.us) for more info or to register.

# Treasurer's Report

Board officers have met for this year's budget meeting to be followed by approval of the budget at the next Board of Directors meeting. All fees have been paid for the RMSS 2022 Conference to all vendors and speakers. The current checking account is yet to pay the chapters for the RMSS 2022 Conference. It has been discussed that all chapters of the PLSC are brought into the same conference agreement the Front Range Chapters have been a part of so long as all chapters are represented in the planning and execution of the conference itself. A portion of the funds raised by the conference will go back to the chapter and add to their budgets.

Following last year's budget meeting and projection it was found that the PLSC would need to tighten down on spending and aim toward breaking even. We managed to meet that goal and keep our current operating budget on the positive side. This year's budget discussion and projection has allowed us to move back to supporting areas cut in the recent past. We welcome 2022!

Key Investments Account: \$288,503



Key Checking Account: \$46,175

Key Savings Account: \$62,851

- Chapter membership dues for Fall 2021 and Spring 2022 still need a registration count for funds distribution.
- 2022 Conference disbursements to be approved by PLSC BOD for distribution.

## Lobbyist:

2022

- April 28th 2nd quarter disbursement \$3,750
- July 8th 3rd quarter disbursement \$3,750
- January 10th 1st quarter disbursement \$3,750

Shaun Lee  
PLSC  
Secretary/Treasurer

# CHAPTER NEWS

## CCPS – PLSC

In June we had our annual CCPS golf tournament at Homestead Golf Course. We had a great turnout and was by far our largest event. Our goal is to keep this tournament on or near the same date going forward and hope to grow it even larger next year. We are still trying to plan a sporting clays event for the fall. We have not finalized the details, but please keep an eye out for more information on this event. Also continue to think about how we can make the CCPS better and send us your feedback.

Derek Brown  
President, CCPS

## NORTHERN CHAPTER

As is our norm, the Northern Chapter is on hiatus for the summer. We tried to plan a summer GPS Day, but got no interest. We're probably all the same kind of crazy busy right now. We'll get back together in the Fall with another year of great programming.

Dave Berglund  
President, PLSC Northern Chapter

## NW 1/4 PLSC

The NW1/4 has come across an issue that those of us who practice in the more rural areas of Colorado are adversely affected by. That is the "Red Warning" that flashes up on the Screen when one uses Google Earth with the individual County KMZ file. The surveyors in Northwestern Colorado, and I suspect throughout the state, use the Goggle Earth program combined with the County KMZ to research monument records in a particular county. But it can be used in any County. This "Red Warning" basically says the expiration date for new entries onto the system was in 2019. In other words, we are now three years behind being current with the system. Whatever monument records have been submitted to the State of Colorado have not been updated since 2019.

This is becoming an issue as we fall further behind on this system. Although one can access current monument records on the DORA site, it is not as user friendly as the Goggle Earth/KMZ system. This system provides a visual image of where the monument records are located within the individual Section/Township and Range, as well as access to the monument records themselves.

The "Red Warning" does provide the phone number, name and email address of a Joyce Young I believe at the

State. I called the phone number, but it is a general phone number for DORA and said there was a 45 minute wait. I will be trying the email next. I also noticed what appears to be a lead to a private surveyor that is raising this issue, but no contact information.

This is a matter the PLSC should be looking into if they are not already and we as a Chapter are greatly concerned and are looking for a solution.

Brian Kelly  
VP, NW1/4PLSC

## SCPLS

Southern Chapter entertained Brian Shaw of NOAA/NGS in May with 18 Southern Colorado surveyors and a great meal. We took a break in June and July. For the August SCPLS member meeting, we have scheduled a title commitment presenter. There is discussion of the Paul Grout Golf Outing taking place this year, but that is yet to be determined. We will have one other member meeting with a drone program best practices presenter in October or November, and of course we will have our annual Christmas Party. The SCPLS website will be updated for August, so stay tuned...

Steven Parker,  
President SCLS

## SWC – PLSC

The SWC held an in-person/virtual meeting on June 28th at the Durango Community Recreation Center. We did not have a topic presenter at this meeting and focused on going over Chapter business and the upcoming "GPS on Benchmarks" event on July 23rd.

Some highlights to this meeting were:

- Treasurer's Report: Account balance is \$10,006.06.
- The Chapter is proceeding to close its existing account with a national bank and move the balance to a local institution, Alpine Bank. Treasurer, Justin Bonnell is working on this action, but there are issues with the Chapter's non-profit/corporation status that need to be worked through. The SWC Officers will work with the State PLSC Executive Director to resolve these issues.
- A budget of \$3,722.55 was submitted to the State PLSC for the 2022 calendar year. President Todd Johnston stated that the State PLSC is proposing to compensate \$5,000 for participation in 2022 Rocky Mountain Survey Summit (RMSS). This is contingent upon State PLSC Board approval in July.
- La Plata County Surveyor, Steven McCormack stated that after much thought and consideration he would not be



# CHAPTER NEWS

running for reelection. The SWC would like to thank Steve for his years of service as La Plata County Surveyor and his dedication in keeping SWC membership apprised of issues pertaining to the Office. You will be missed Steve!

- The SWC will reach out to other County Surveyors in the surrounding areas and offer them an opportunity to give updates/news at future Chapter meetings.

- Todd Johnston gave an update on RMSS Committee. So far the Committee has gotten commitments from Dennis Mouland, Dane Courville and Brian Shaw to speak at the 2023 RMSS. The format will be a bit different in 2023. The Summit will be four days (Tuesday through Friday) with three hour classes in the morning and three hour classes in the afternoon. There will be Professional, Business and Technical tracks.

- There was discussion on the updating of monument records on the Department of Regulatory Agencies (DORA) website. Through inquiry from another Chapter's member, it appears DORA has struggled to scan and update monuments records due to COVID. According to the correspondence they are working to address the issue.

- Todd Johnston gave an update on the State PLSC scholarship program. The program is being underutilized and there is plenty of money available for education. Reimbursement is not just available for classical college classes, but also for the CFeds programs, training courses, etc. See the PLSC.net website for more information.

- A motion was passed for the SWC to sponsor a back country CPR/first aid for members. More to follow on this initiative.

- The Chapter will hold a "Surveyor Rendezvous" dinner in December 2022. SWC Vice President Josh Casselberry will head up a committee to plan this event.

- Time was spent on planning the upcoming "GPS on Benchmarks" event on Saturday, July 23rd. Local surveyors to the Durango area will focus on occupying benchmarks on US Highway 550 north of Durango, US Highway 160 west of Durango and State Highway 140.

Our next meeting is scheduled for September 20th.

Everyone have a great Summer!  
Todd C. Johnston, PLS  
President - SW Chapter PLSC

## WCLS

Western Colorado Land Surveyors Fall Seminar is just around the corner! If you have not received a flyer please contact WCLS at:

[westerncoloradolandsurveyors@gmail.com](mailto:westerncoloradolandsurveyors@gmail.com)

This is a great event and we are happy to finally bring it back. I look forward to seeing old and new faces. Following the Seminar we will be having a short Chapter Meeting. I would like to thank Chris Ransier, Alex Lheritier, and Tom Sylvester for helping put this together. Their time and effort was greatly appreciated. Scholarship winner(s) will be announced at the Seminar also.

Remember, WCCC Land Surveying and Geomatics classes are available to those interested! In person or remotely. This is a great opportunity.

<https://www.coloradomesa.edu/wccc/programs/land-surveying-geomatics.html>

Hope you are having a great summer,

Brian K. Bowker, P.L.S.  
President, WCLS

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