



SURVEYOR CALIFORNIA

ISSUE #184
FALL 2016



**Why Every City Needs
a Strong City Surveyor** (page 11)

GET SPECIAL DISCOUNTS at Office DEPOT with your CLSA Membership

The program includes:

- Savings of up to 70% on commonly used items
- FREE next-business-day delivery
- Thousands of products in stock
- Unparalleled expertise
- Ultimate shopping convenience by phone, fax or online
- The latest in office technology
- Office Supplies, Furniture and More!

**OFFICE DEPOT
IS YOUR
ONE STOP SHOP!**

**CALL CLSA
at 916-239-4083
FOR MORE INFO**

**Office
DEPOT** *Taking Care of Business*

CLSA 2016 BOARD OF DIRECTORS

STATE OFFICERS

Roger K. Hanlin, *President* • **Ian Wilson**, *President-Elect*
Ronald J. Nelms, *Secretary* • **Annette Lockhart**, *Treasurer*
Jay K. Seymour, *Immediate Past President*
Jeff Burgess, *Executive Director*

DIRECTORS

Bakersfield Chapter

Ronald J. Nelms

Cascade Chapter

Stephen W. Dean • Nathan Sellers

Central Coast Chapter

Ian E. McClain • Robert J. Reese • Mike Stanton

Central Valley Chapter

Keith W. Spencer • Kevin J. Genasci

Channel Islands Chapter

Frank S. Maxim • Bill Hurdle

Desert Chapter

Christopher L. Alberts • Douglas E. Redlin

East Bay Chapter

Tom Finnegan • Steven M. Mendenhall • Richard P. Ray

Gold Country Chapter

Marc R. Van Zuuk

Humboldt Chapter

Michael D. Pulley

Lake / Mendocino Chapter

Steven Kent Farr

Los Angeles Chapter

Erik G. Bowers • Mark R. Danielson • Stephen Michael Hughey
Richard M. Snadaker • Steven G. Stenhoff • Theresa M. Strazzella

Marin Chapter

Lawrence A. Stevens

Monterey Chapter

Lynn A. Kovach • Steve Wilson

Mother Lode Chapter

Richard James

Northern Counties Chapter

James M. Herrick

Orange County Chapter

Michael LaFontaine • Joseph A. Padilla • Trevor D. Rice
Steve Slocum • Diane Wells • David E. Woolley

Riverside / San Bernardino Chapter

Nathan J. Carlson • John R. Duquette
Thomas P. Herrin • Ryan M. Versteeg

Sacramento Chapter

Michael Chiara • Matt Stringer • Sherrie J. Zimmerman

San Diego Chapter

Paul E. Goebel • Gary L. Hus • Armand A. Marois

San Francisco Chapter

Alex Calder

San Joaquin Valley Chapter

Kevin W. Nehring

Santa Clara / San Mateo Chapter

Paul W. Lamoreaux • James F. Wright

Sonoma Chapter

Howard W. Brunner • Michael Mueller

CLSA CENTRAL OFFICE

Jennifer Blevins, CMP,
Director of Management Services

Jeff Burgess, Executive Director

John Berkowitz, Publications Director

Valerie Chavez, Bookkeeper

Michael Cochran, Webmaster

Sophia Lisaius, Account Administrator

Stephanie Schoen, Special Projects

Tricia Schrum, CPA, Accountant

Natalie Thurn, Meeting Planner

Central Office

2520 Venture Oaks Way, Suite 150
Sacramento, CA 95833
916-239-4083 • 916-924-7323 fax
clsa@californiasurveyors.org
www.californiasurveyors.org

California Surveyor Editor

Landon Blake
lblake@hawkins-eng.com

California Surveyor Designer

John Berkowitz
john@caladmanagement.com

Advertising

Commercial advertising is accepted by The *California Surveyor*. Advertising rates and information can be obtained on the CLSA website at www.californiasurveyors.org/calsurv.html, or by contacting Sophia Lisaius at advertise@californiasurveyors.com or 916-239-4083. Circulation: 4,800.

Editorial Material

All articles, reports, letters, and other contributions are accepted and will be considered for publication regardless of the author's affiliation with the California Land Surveyors Association, Inc. Contributions should be e-mailed to Landon Blake at lblake@hawkins-eng.com.

Material Deadline Dates

Spring: March 1
Fall: September 1

Articles, reports, letters, etc., received after the above mentioned date will be considered for the next edition.

Opinions expressed by the editor or individual writers are not necessarily endorsed by the California Land Surveyors Association Officers or its Board of Directors. Original articles may be reprinted with due credit given to the source and written notification to the California Land Surveyors Association, unless otherwise noted.



PRINTED ON
RECYCLED PAPER



PRINTED WITH
SOY INK



SURVEYOR CALIFORNIA

ISSUE #184
FALL 2016



COLUMNS

President's Message – Roger K. Hanlin	3
Editor's Message – Landon Blake	5
Legislative Report – Ralph Simoni	6
Central Office Report – Jeff Burgess	8



FEATURES

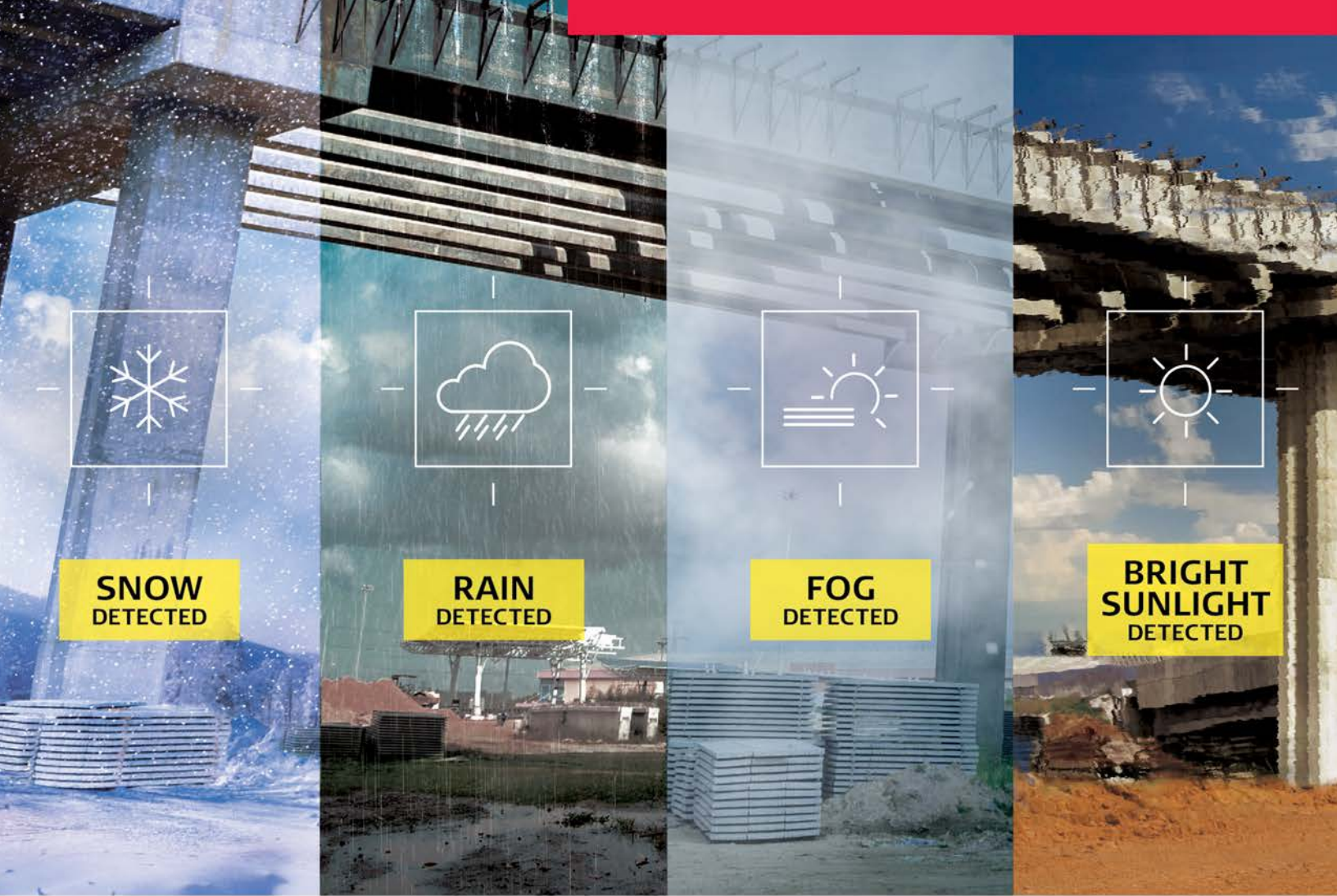
Why Every City Needs a Strong City Surveyor – Landon Blake	10
Commercial Use of Drones in California – Landon Blake	17
THE NEW DRONE LAWS: What You Need to Know – Logan Campbell	19
Understanding Survey Error Adjustment (with Open Source Code in Java and Groovy) – Landon Blake	21
A Review of IBLA 99-363 (part 1) – Landon Blake	25
Review of <i>Brothers, Inc. v Johnson</i> – Landon Blake	29
PUBLIC/PRIVATE PARTNERSHIPS IN LAND SURVEYING: The Consequences of Violating Ethical and Legal Boundaries – Landon Blake	33
Document Contract Changes – James A. Anton	38
CLSA CONFERENCE – Save the Date – Jeff Burgess	39



The *California Surveyor* is a bi-annual publication of the California Land Surveyors Association, Inc. and is published as a service to the land surveying profession of California. It is mailed to all Licensed Land Surveyors in the state of California, as well as to all members of the California Land Surveyors Association, Inc. The *California Surveyor* is an open forum for all Surveyors, with an editorial policy predicated on the preamble to the Articles of Incorporation of the California Land Surveyors Association, Inc. and its stated aims and objectives, which read:

Recognizing that the true merit of a profession is determined by the value of its services to society, the California Land Surveyors Association does hereby dedicate itself to the promotion and protection of the profession of land surveying as a social and economic influence vital to the welfare of society, community, and state.

The purpose of this organization is to promote the common good and welfare of its members in their activities in the profession of land surveying, to promote and maintain the highest possible standards of professional ethics and practices, to promote professional uniformity, to promote public faith and dependence in Land Surveyors and their work.



World's First Self-Learning System

As the industry's only solution with intelligent environmental awareness, the NEW Leica TS16, TS60, an MS60 bring the field of surveying a step closer to artificial intelligence. Incorporating groundbreaking technologies, these instruments adapt to more than 200 challenging environmental conditions, ignoring all distractions in the field and remaining locked onto the sole target – yours. Along with an immersive 3D experience from our Captivate Software, you are empowered to do what you never thought possible and what others only wish they could do.

For more information, contact:
NORTHERN CALIFORNIA
Jason Paris: (831) 247-1881
(e) jason.paris@leicaus.com

SOUTHERN CALIFORNIA:
James Yaccino: (714) 308-3889
(e) james.yaccino@leicaus.com



Be Captivated.

- when it has to be **right**

Leica
 Geosystems

Visit Us: www.leica-geosystems.com/becaptivated





PRESIDENT'S MESSAGE

Roger K. Hanlin, PLS CLSA 2016 President

This year has been a unique year for CLSA. As we celebrated our 50th anniversary, 2016 began with a new management team along with all the challenges that accompany any management transition for a corporation as old, large and complex as CLSA. The good news is, we worked through the challenges together and continue to provide CLSA members the resources and benefits befitting a professional association. So as 2016 enters its final quarter, I am pleased to have the opportunity to highlight some of this year's accomplishments, encourage continued member support and thank all those who have dedicated their time and energy to continue our goal to "promote and enhance the profession of surveying."

Recognizing our commitment toward the future, the Education Foundation presented over \$50,000 in scholarships this year to deserving students throughout California who have chosen a career path to follow in our footsteps. I would like to thank all the Chapters, individual members and businesses that contributed to the scholarship fund and especially Education Foundation Chair, Bill Hofferber (Riverside/San Bernardino) along with Foundation members for their dedication. Many of the students acknowledged appreciation for the assistance and recognition. It was a pleasure to attend two conferences this year at California

State University, Fresno and Cal Poly Pomona sponsored by the student chapters.

As always, the Legislative Committee had another busy 2015-2016 legislative session tracking 50 or more proposed bills. Committee Chair, Michael Butcher (San Diego) continues to keep CLSA relevant by dedicating his time and energy along with all the committee members coordinating meetings and working with Legislative Advocate, Ralph Simoni, reviewing bills that directly affect the land surveying profession. The committee provides thorough quarterly reports and updates for the CLSA Board of Directors and remains in constant communication with the Central Office. Look for the eNews e-mails that will go out on a more frequent schedule in the coming year and read the legislative report and the CLSA position on selected legislation. If you know Michael or someone on the committee thank them for their dedication.

Let's not forget to acknowledge another valuable CLSA resource, the Workshop Committee. This Committee has exceeded expectations this year coordinated by Chair, Rich Maher (Orange County). The Committee developed webinars and workshops with the Central Office on a wide variety of topics for the practicing surveyor and members of the public relying

on the surveying industry. The workshops are located up and down the state at convenient locations in both northern and southern California. I would like to recognize Rich for a job well done and thank him for volunteering to chair this year's Workshop Committee. Look for the upcoming workshops and webinars offered in the *CLSA eNews* and on the CLSA website event calendar.

Another new CLSA event occurred this summer with a focus on membership retention. The Central Office and CLSA Chapters coordinated a membership drive during the month of July. Chapters were asked to volunteer in a combined effort to contact CLSA members who may have forgot to pay their dues as well as recruit new members prior to the July 31st membership dues deadline. The membership drive was successful and increased membership numbers exceeding 2015. This effort increased revenue by over \$15,000. I would like to thank all the chapters, individual volunteers for their dedication to CLSA and thank you to the members who have renewed their membership and welcome all new members.

This summer also had an election for 2017 President-Elect. Candidates Ron Nelms (Bakersfield) and Joe Padilla (Orange County) campaigned vigorously throughout California

and met with members to discuss CLSA's future. Congratulations to Ron Nelms, elected as 2017 CLSA President-Elect. Thanks to both candidates for their time, effort and commitment to CLSA.

CLSA will finish the year as unique as it began by having the November 5th Board of Directors meeting using webinar technology. This will allow Directors to assemble at remote locations and communicate to take care of CLSA business. This option will substantially reduce CLSA meeting costs so the savings can be used to benefit CLSA resources serving the membership.

In summary, I have been inspired by working with all the dedicated professionals throughout CLSA and have grown personally and professionally from the experience. It was a good career decision to join CLSA back in 1986 and would recommend all surveying professionals to join CLSA to continue providing support for the resources and benefits that "promote and enhance the profession of surveying."

It has been an honor to serve all of you and I want to thank fellow Officers, Committees, Chairs, Liaisons, Cal Surveyor Editor, Directors, Chapters and the Central Office for all your time and energy to continue making CLSA what it is and all that it is supposed to be. 🌟



ALLEN

Instruments & Supplies



*Providing innovative solutions for surveying, engineering,
mining, construction and GIS*



Trimble R10
GNSS System



Trimble S7
Total Station



Spectra Precision
Focus 35



Trimble R8s
GNSS Receiver

**Your Most Trusted Geospatial Advisor for
California and Arizona Since 1969**



Spectra Precision
SP80 Receiver



Trimble TX8 Laser
Scanner



Spectra Precision
Ranger 3 Data Collector



Trimble UX5 Aerial
Imaging Soutlion

SALES • SERVICE • RENTALS • SUPPLIES

Arizona
800.272.0180
7114 E Earll Drive
Scottsdale, AZ 85251

www.alleninstruments.com

California
800.215.2737
2940 E La Palma Ave, Suite F
Anaheim, CA 92806



EDITOR'S MESSAGE

Landon Blake
California Surveyor Editor

Welcome to the Fall 2016 Issue (Issue #184) of *California Surveyor Magazine!* We have a full issue with excellent content for the modern land surveyor. There are articles on business, government regulation, new technology, and common law. Before I give you an overview of the articles in this issue, let me tell you about a change to our magazine.

We will only be publishing two issues of *California Surveyor* a year (instead of four) for the foreseeable future. This change was made by the CLSA board of directors to reduce costs and balance the organization budget. You should already be receiving the monthly digital newsletter via e-mail, the *CLSA eNews*. As I continue to learn about

the board's communications strategy, I'll share what I find out with you.

An article on strong city surveyors leads our fall issue of the magazine. In this article, I explain why it is so important for our California cities to have a strong city surveyor role. In this article, I include an interview with City Surveyor, Rich Fultz.

We also have four articles dealing with business and regulation in this issue. Two of those articles are from the Orange County Chapter members. One is an article about the need to document contract changes, and was contributed by John Anton. The other is an article about the commercial use of drones in a surveying business, and was contributed by Dave Wooley.

We have a second article on drones in surveying that reviews new FAA regulations. This article was our second contributed by the owners of Aerotas. one additional article on business and government regulation in this issue deals with the consequences of violating legal and ethical boundaries when selecting consulting land surveyor services.

There are two articles on the common law related to land surveying in this issue. One is an initial review of an IBLA decision from Washington State that involves the Public Land Survey System. The other is a review of the court decision in *Brothers, Inc. v Johnson*, a surveyor caused adverse possession case from Louisiana.

We start or continue several article series in this issue of our magazine. We have the second contribution from Dave Wooley on our articles of the business of surveying. We have the second contribution from Aerotas on mapping with drones. Three new series also start in this issue. These include the article series on survey error adjustment, the article series on IBLA decisions, and an article series on the land surveyors role in adverse possession.

I hope you enjoy our fall magazine. I appreciate all the help from John Berkowitz, Jeff Burgess, the Orange County Chapter, and Aerotas with the content for this issue. I look forward to working with everyone on our Spring 2016 magazine. 🌐





LEGISLATIVE REPORT

Ralph Simoni CLSA Legislative Advocate

Aecause I am writing this article a week before the 2016 General Election, the election results will be history by the time the Cal Surveyor reaches your inbox. However, the article is intended more to demonstrate the importance of electoral participation and the impact these decisions will have on your profession and family.

Avalanche of Ballot Propositions

Although the major focus is on the presidential election, Californians will be confronted with a broad array of decisions on ballot propositions. There are 17 statewide ballot propositions and a myriad of local city, county, and special districts ballot propositions depending upon where you reside.

These 17 ballot propositions run the gamut from broad public policy issues such as extending the “temporary” income tax rates on high income wage earners and legalization of marijuana to more narrow public policy issues such as regulating adult performers and banning plastic grocery bags. Ballot propositions presented to the electorate can be either a statutory or state constitutional enactment.

Many of these ballot propositions are the result of legislative inaction, especially the inability to obtain a 2/3rds vote necessary to increase taxes or polarizing social issues such as gun control and the death penalty. The only alternative for influential special interest groups is to gather signatures and mount a campaign to convince the electorate of the merits of their ballot proposal.

The phenomenon of ballot propositions traces its origin back to the Hiram Johnson populist era of “direct democracy” in the form of the initiative, referendum, and recall of elected officials in order to provide California citizens direct participation to combat the political disproportionate influence of the railroad industry. However, these early populist reforms adopted in 1911 have taken on a different dimension in the current political climate where the initiative and referendum are used by dominant and well-funded political constituencies to push their agendas directly with the public using sophisticated modern media and voter outreach. Some might suggest that the initial intent of these populist “direct democracy” concepts are being undermined, or in some cases, abused by well-funded special interest

groups with thirty second radio and television ads, as well as sophisticated voter targeting.

As a professional land surveyor and California registered citizen, they are many approaches to evaluating how a particular ballot proposition affects your life. Certainly, every Californian citizen must filter the initiative through the lens of their own value system and philosophy of government – what is important for my family and are taxes fairly assessed and against? Additionally, CLSA members need to drill down into the proposed initiatives to determine whether they have an impact on their profession and income. This is a very subtle task.

Let’s evaluate to ballot propositions on the November 2016 General Election ballot from the perspective of the land surveying profession.

Proposition 53: Requires statewide voter approval before any revenue bonds can be issued or sold by the state for certain projects if the bond amount exceeds \$2 billion. The Office of Legislative Analyst states “it is unlikely there would be very many projects large enough to be affected by the measure’s requirement for voter approval.” The proposed tunnels to move water through the Sacramento

to San Joaquin River Delta and California High-Speed Rail are two projects that would require voter approval should Proposition 53 pass.

Not surprisingly, Proposition 53, was placed on the ballot by opponents to the proposed water conveyance through the Delta.

In addition to the overall wisdom of asking voters to decide specific infrastructure projects, a land surveyor might ask such questions as how this might impact survey projects/business opportunity and income in the future. Because major infrastructure projects require in-depth analysis and review over many years prior to fruition, these projects will encounter the additional delay of being placed on the ballot two years in the future, as well as the prospect of rejection for reasons not specific to the project. Also, might large infrastructure projects in the future be developed upon what might gain public approval, rather than analysis and review based on sound engineering and finance principles.

Proposition 55: Extends by twelve years the temporary personal income tax (PIT) increases enacted in 2012 on

continued on page 7



earnings over \$250,000 for single filers and over \$500,000 for joint filers with revenue dedicated to K-12 education and community colleges. The 2012 enactment was Proposition 30 champion by Gov. Brown that imposed a ¼% sales tax increase for four years and 2% surcharge on incomes for six years as noted above.

Although there may be numerous personal reasons for a position on this ballot proposition (e.g., how will it impact my personal income taxes +/-, will it improve my child's educational opportunities, etc.), there is perhaps another more surveyor specific perspective. As the profession has been challenged by a potential tax on surveyor services, perhaps the multibillion-dollar annual revenue stream generated by Proposition 55 will provide sufficient revenue to avoid the need for future consideration of a tax on services.

I am not suggesting or taking a position on these or any other ballot proposals, but merely illustrating the point that there are many perspectives by which CLSA members can evaluate and make their own personal decision about particular ballot propositions that are increasingly becoming the public policy alternative to the legislature.

What about Candidate Elections

In addition to the presidential election, ballots will include numerous state and local candidates. State candidates will include all 80 Assembly members who serve two-year terms and 20 of the 40 Senate members who serve four-year terms. Given the partisan nature

of the California legislature, these down ticket races are being influenced by the party of each presidential candidate.

What's at stake? Although predominantly Democratic in composition, neither the current Assembly or Senate possess a "super majority" or 2/3rds status which confers the ability to impose taxes, override gubernatorial vetoes, and amend the state constitution. However, Democrats are only two votes short of a "super majority" in the Assembly and several incumbent Republicans are vulnerable in districts that were won in the low turnout election of 2014. If two or more of these vulnerable seats are won by Democrats, Democrats would have 54 members and possess a super majority. Although Democrats are only one vote short of the super majority in the Senate, the consensus wisdom is that it will be more difficult, but not impossible, to achieve the 27 members sufficient for a super majority.

Is a super majority myth or reality? This is a highly debatable question, especially with the emergence of a core group of pro-business Democrat moderates in both the Assembly and Senate who are reluctant to vote for many proposals, especially environmental proposals that might adversely impact the economy and tax increases. These "moderates" are willing to vote their conscience and their district notwithstanding pressure from the Democratic leadership to join the majority for a 2/3rds vote. In part, this inability to consistently rely upon a 2/3rds vote is the reason for the many ballot initiatives discussed above. In my opinion, the evils of a super majority are more myth than

reality because of this fracture within the Assembly and Senate caucuses.

Update on Scope of Practice Discussions

Past legislative columns have mentioned the efforts to revise the land surveyor scope of practice provisions contained in Business and Professions Code 8726. During the 2016 session, Senate Bill 1099 (Cannella) was introduced at the request of CELSA which proposed various statutory scope of practice changes. Although there were numerous discussions and meetings, the bill was not acted upon because CLSA and other professional organizations opposed.

The opposition was based upon both the timing and substance of the proposed changes. As to timing, CLSA asserted that it was premature to introduce and act upon legislation until there was a thorough identification and of current problems and a consensus on any proposed changes. In addition, it was suggested that statutory changes alone would not improve the profession and that there must

be both an educational and an enforcement component in order to make meaningful long-term improvements. It was the position of the CLSA Legislative Committee that once a thorough vetting of current problems was undertaken, the stakeholders would be in a better position to propose actual, statutory changes and avoid potential unintended consequences.

The CLSA Legislative Committee established a task force of members charged with the responsibility to meet with other stakeholders (CELSA, ACEC, PEEG, etc.) to initiate the vetting process and develop a comprehensive approach likely to involve statutory amendments, as well as an education and an enforcement component. The CLSA task force has participated in numerous stakeholder meetings over the past two months to commence the process of identifying specific problems and proposed solutions. This is a complex task that could take between six and 12 months before it is completed. The CLSA task force members should be complemented for their commitment on this extremely important matter to the entire profession. 🌐





CENTRAL OFFICE REPORT

Jeff Burgess CLSA Executive Director

Time flies when you're having fun! California Advocates Management Services (CAMS) has recently surpassed one-year of managing CLSA and what a year it was. CAMS continues to be honored to serve as CLSA's Central Office as the association transitions into its second half-century, and we are pleased to report the CLSA Board of Directors has accepted CAMS' offer to extend the contract for management services.

The CLSA Central Office has implemented numerous member initiatives on behalf of the Executive Committee and the Board of Directors during CAMS initial tenure as your association management company. While "keeping the lights on" is the day-to-day focus, we are inclined to start by celebrating the execution of CLSA's 50th Anniversary Conference last March. Under the leadership of Conference Committee Chair Aaron Smith, CAMS staff executed the following:

- Conducted an e-mail and print mail campaign to drive attendance
- Implemented an online registration platform
- Created a registration database then registered and processed 430 participants
- Developed onsite brochures, signage, and related collateral

- Sold-out the Exhibit Hall, which featured 25 booths
- Secured 13 conference sponsors resulting in \$17,000 in revenue
- Oversaw the Education Foundation's bowling and golf events
- Implemented the 50th Anniversary Gala event with over 100 revelers
- Organized and facilitated the Education Foundation's auctions
- Managed speakers for 51 workshops and breakout sessions
- Coordinated the student volunteers program

The conference survey results say it best: 96% of respondents rated the overall conference experience as "Excellent" or "Good." CAMS was proud to execute the Conference Committee's vision for an event befitting this monumental anniversary!

Not resting on our laurels, CAMS got right to work preparing proposals for the Board of Directors to consider for the location of the 2017 CLSA Annual Conference. The Board selected Orange County for next year's gathering and CAMS has secured terrific facilities to host the event: the Wyndham Anaheim Garden Grove (formerly the Crown Plaza) and the adjoining Sheraton Anaheim Garden Grove.

Both of these four-star hotels are just a short shuttle ride away from Disneyland, and the expansive meeting rooms will allow us to hold all conference activities within a few steps of each other.

The CLSA 50th Anniversary Conference wasn't the only continuing education achievement in 2016. Under the leadership of Workshop Committee Chair Richard Maher, CLSA and CAMS teamed up to execute successful workshops featuring nationally renowned surveying presenters, Gary Kent and Jeff Lucas. CLSA is fully embracing technology that enables distance learning with an all-new monthly webinar series. In 2016, CLSA held six webinars with nearly 1,000 registrants, and a dozen more webinars are planned for 2017. CLSA even conducted a Board of Directors meeting via webinar – saving the association roughly \$10,000!

In the association management industry, successful event planning is often considered the noteworthy accomplishments. But for well-administered organizations, the most significant effort goes into membership, and for CLSA and CAMS, 2016 has to be considered a success. CAMS facilitated a mid-year membership drive including two Chapter Representatives Meetings via webinar, supported participating chapters with updated membership rosters and collaborated with the leadership

of participating chapters to renew as many existing members as possible while – at the same time – enticing new members to join. Due to the efforts of all involved, CLSA ended the year with 1,776 individual members – which equates to 101% member retention. CLSA is prepared to do even better in 2017. With a new Microsoft Access membership database developed by CAMS, custom report queries will be developed to support state and chapter membership efforts on-demand and in real-time.

2016 had plenty of challenges – as would be expected in a year of transition. Many more administrative and creative tasks were accomplished than the ones noted above. CAMS has been truly fortunate to have been given the time, effort and guidance of the CLSA Executive Committee and Board of Directors. In particular, special recognition must be bestowed upon 2016 CLSA President Roger Hanlin, who exhibited extraordinary leadership during his most challenging tenure. Thank you very much President Hanlin – your CLSA staff appreciates your wisdom and dedication!

CAMS, performing as your Central Office, looks forward to serving CLSA in 2017 and we hope that our service will result in the opportunity to meet many of you face-to-face in the coming year. 🌟



HIGH ACCURACY AT RECORD TIME

Finally, the only tool that sets your 3/4" brass tags in under a minute!



Limited time offer
bundle price



Watch our instructional video at:
o-tags.com/instructions



SCAN HERE

USING O-TAGS™ SYSTEM



 WITHOUT O-TAGS™ SYSTEM

Adjustable Drill Pilot and Counterbore

Allows to customize drill bit and stop collar **depth** using O-TAGS™ U-Shaped Allen Wrench.

Counterbore Cutter

Designed to accommodate typical standard 3/4" **Brass Tags** used in California.



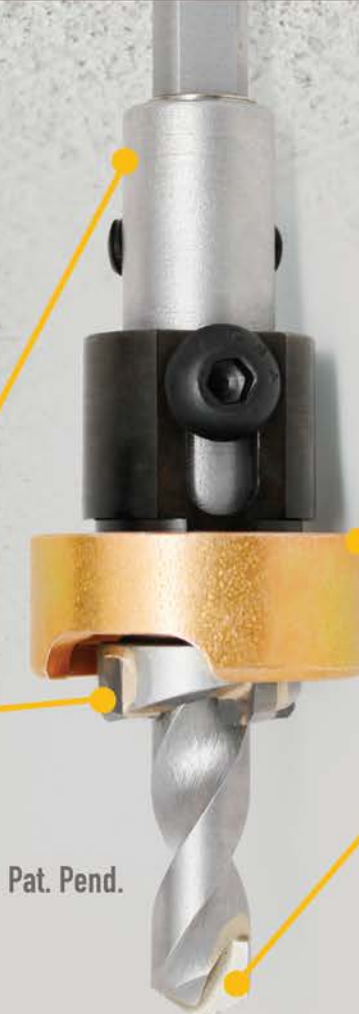
 WITHOUT O-TAGS™ SYSTEM

Stop Collar

Allows all surfaces to be protected from **collar rotation damage** while able to view when stop collar makes contact with surface.

Carbide Notched Drill TIP

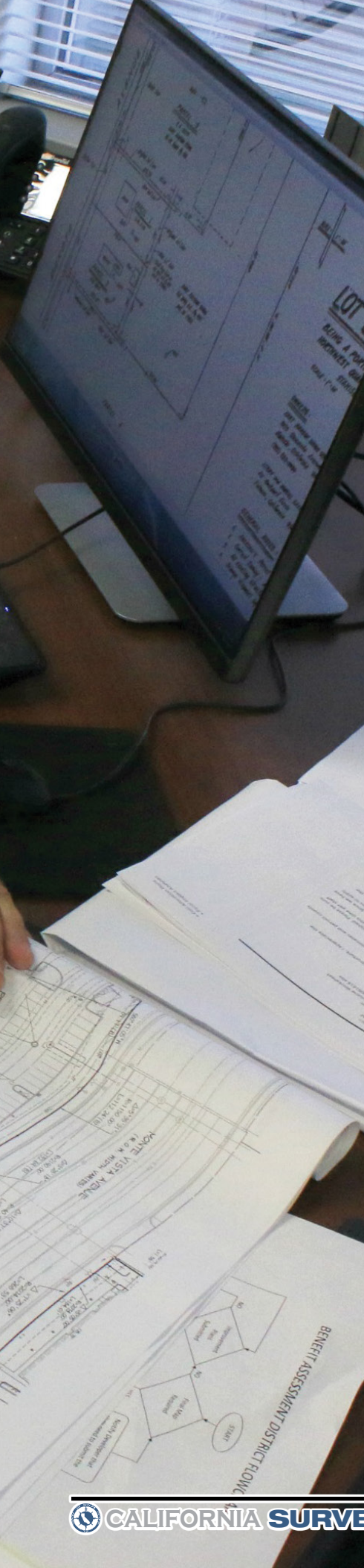
Engineered for drilling hard materials such as concrete, brick, tile, marble, granite and metal. Minimizes Bit walking and up to **50% faster than standard masonry Bits**.



Pat. Pend.

WWW.O-TAGS.COM





Why Every City Needs a Strong City Surveyor

By Landon Blake, *Redefined Horizons*

Introduction

The first time I realized the importance of a good city surveyor, I was sitting across from a civil engineering technician who had completed the first review of a parcel map I was trying to get approved and filed. I had complied with all of the city requirements and done a good job on the boundary resolution, but the civil engineering technician was very adamant that I remove all of the boundary survey notes from the second sheet of my parcel map. I explained that those notes were a very important part of the boundary resolution of the parent parcel, and that removing the notes would make the map incomplete. My explanation didn't make a difference. The technician told me plainly: "The notes have to come off or we aren't going to file your map."

I asked her why the notes needed to come off the map, as I couldn't think of a legitimate reason for their removal. She answered: "Because our other standard plans at the city don't have anything like the notes you included." I imagine I had a stunned and stupid look on my face at that point in the conversation. I told her: "This parcel map isn't a set of standard plans. It is a boundary survey and a land subdivision, and every boundary survey is unique. You can't force it into a set of standard city details."

The technician still refused to budge. When I returned to my office and reviewed the conversation with my boss, his response was simple: "Tell the civil engineering technician that you want to talk to the licensed surveyor in responsible charge

for the map review before you remove the notes." My boss knew the dirty little secret that I didn't. The city didn't have a licensed land surveyor in charge of parcel map review. There may have been a pre-1982 civil engineer up the chain-of-command at the city that was in charge only in name, but he didn't know or care anything about the process. That's why it had been delegated to the civil engineering technician in the first place.

A few days after I followed my boss's suggestion, my parcel map was filed with the boundary survey notes in place.

As I look back on this situation now, I realize how much I would have benefited at that

continued on page 12



point in my career from a high quality review of my parcel map and a bit of back and forth with another land surveyor engaged in the map review process. I didn't get that benefit, and my client had to pay for my time to deal with nonsensical map review comments. In this situation, without a real city surveyor, everyone lost. My client lost money, I lost the opportunity for valuable feedback, and the city lost an opportunity to be engaged in the land subdivision process.

The problems at this city (which still doesn't have a real city surveyor) have persisted throughout my career to the present. This includes widespread destruction of survey monuments on city street improvement projects, poorly written RFPs that often violate state law, and no comprehensive plan for survey control within the city.

It is my strong belief that every California city could benefit from an effective city surveyor in a strong city surveyor role.

What Is A City Surveyor?

What is a city surveyor? I believe it would be helpful to define the term for the purposes of our discussion in this article. Here is my short definition of a city surveyor:

A licensed land surveyor working at a high level of municipal government to directly oversee land surveying activities performed by the city government. This includes the review and approval of private land surveying activities when authorized by law. It also includes have an advisory role in other activities of city government related to land use planning, land development, and public infrastructure.

Note some key parts of this definition. An effective city surveyor is:

1. A licensed land surveyor that can take responsible charge of surveying activities.
2. Placed in a high-level of municipal government. (Not buried 7 levels deep in the public works org chart and reporting to an engineering tech level 3.)

3. In direct control of map review and other land surveying activities.
4. Able to fill an advisory role in related city activities.

Typical Activities of a Strong City Surveyor

The list of activities performed by a strong city surveyor will vary from city to city. However, I've put together a basic list of city surveyor activities below. The list is separated into two sections. The first is activities that should be directly supervised by the city surveyor. The second is a list of activities in which the city surveyor may only have a support or advisory role.

Activities Under the Direct Supervision of the City Surveyor

1. Manage city right-of-way and easements. (This includes maintaining land records, establishing locations, monitoring/preventing encroachments, and overseeing dedications.)
2. Manages land title and boundary surveying of city owned parcels. (This includes maintaining land records, establishing locations, and monitoring/preventing encroachments.)
3. Prepares and/or reviews survey documents (legal descriptions and maps) for acquisitions and disposal of city property, right-of-way and easements.
4. Prepares and/or reviews survey documents (legal descriptions and maps) for agreements and other legal documents.
5. Manages selection and implementation of contract surveying services for the city.
6. Helps integrate accurate data into city GIS.
7. Manages the city wide horizontal and vertical control network.
8. Managing linear referencing (route stationing) and street address systems.

9. Provides a primary point-of-contact for private surveyors/engineers working in the city.
10. Provides information to the public regarding property boundary issues. Responds to citizen and business questions about property boundaries.
11. Designs and implement a system for monument preservation on both public and private projects within the city.
12. Prepares or reviews accurate administrative and regulatory boundaries (for example: annexation boundaries or land planning boundaries).
13. Supervise the land subdivision process and other aspects of land regulation within the city. (This includes lot-line-adjustments, parcel mergers, elevation certificates, LOMA/LOMR applications, pad certifications, and building set-back verifications.)

Support Activities Provided By the City

1. Provides land surveying services for capital improvement projects.
2. Advises the city on real estate transactions involving city parcels or public funds.
3. Provides property and/or right-of-way acquisition services.
4. Helps shape development and land use policies and regulation.
5. Provides support for pre-development projects (projects in the entitlement stage).
6. Provides advice on property related issues to other city departments. (For example: Is this sewer line in an easement? Which parcel is this document connected with?)

What Are The Benefits of a City Surveyor?

It is clear from the list of activities above that a strong city surveyor can fill a large (and important) role in municipal

continued on page 13



government. What benefits do these activities bring to the city government, city citizens, city businesses, and private surveyors working in the city?

A major portion of city government activities involve land parcels in one form or another. This includes land use planning activities and land use activities. It also includes transportation infrastructure, utility infrastructure and management of flood hazards. This close link between municipal government activities and land parcels makes a few of the benefits of strong city surveyor activities stand out. These benefits include:

1. Land records that are easy to access, organized, current and tied to a common geospatial coordinate reference system.

2. Clean land title to city fee property, right-of-way and easements that is free from encroachments and easy to locate on the ground.
3. A consistent strategy and set of best practices to describe the location of land parcels and structures across the city.
4. Avoidance of unnecessary risk related to land title and the location of property and easements.
5. Clarity around the location of administrative and land use planning boundaries.

The activities of a strong city surveyor we listed above also contribute directly to more effective design, construction and maintenance of city public works and utility infrastructure. Benefits related to

infrastructure from strong city surveyor activities include the following:

1. Infrastructure records that are easy to access, organized, current and tied to a common geospatial coordinate reference system.
2. Appropriate land rights for public infrastructure and utilities that are properly documented and in a location that covers the actual physical improvement.
3. A consistent strategy and set of best practices to describe the location of public works and utility infrastructure across the city.
4. Reduced cost during construction of public works realized through reduced layout expenses, fewer

continued on page 14

Interview with Rich Fultz – Turlock City Surveyor



Interview

What is your role at the City of Turlock?

I am the Development Services Supervisor/City Land Surveyor within the Engineering Division of the Development Services Department. By the length of my title you probably realize that I get the opportunity to wear many different hats. I'm involved in many activities at the city. I manage a team which includes: a Senior Civil Engineer, a Permit Technician, a Land Surveying Technician and three Public Works Inspectors. Our team is responsible for a variety of aspects of land development and capital improvement projects. My main role is to review and approve all the maps and other survey documents along with providing land surveying to support our capital improvement projects.

What accomplishments as City Surveyor are you the most proud of?

I am proud to say that my efforts have promoted the profession of land surveying in and around the City of Turlock. When I started with the City

of Turlock, there was only a handful of people who had any idea of what land surveyors do. Now, after being here for 13 years, I know many other coworkers understand what we do and utilize us as a resource. I have enjoyed having the opportunity to build a surveying program for our city from the ground up.

How has Turlock benefited from having a City Surveyor?

There are many occasions when city staff might be brainstorming to solve an issue with a project. Land surveyors play a critical role in land development and should be at the table during these discussions. Having a land surveyor on staff makes this involvement more likely.

The fact that I spent the first part of my career in the private sector has been beneficial. Every time we implement or refine one of our processes, I always consider how it will affect the folks on the other side of the counter. I consider myself and the City of Turlock part of the team for a successful land development project. If we can

identify ways to make the project flow smoother, we need to do so.

There are many other opportunities (beyond land development) that allow a land to bring value to a municipal government team. Public agencies are involved with a variety of documents, such as agreements that are associated with a specific property. Ensuring the property is described accurately and that the document is filed into public record appropriately is critical.

Having a Land Surveyor on staff provides a valuable resource to entire agency. Any questions regarding a property boundary, right-of-way, easement, jurisdiction boundary can be addressed very efficiently. It would be time and cost inefficient if the city had to rely upon a contract land surveyor to respond to these types of questions.

On the capital improvement project side, there are definitely benefits in providing the boundary, topography and construction staking services in-

continued on page 14

Introduction

I have the privilege of working with one of the few cities in California that has worked over the past decade to create a Strong City Surveyor. The benefits to that city have been clear in my work for Turlock, both as a consultant working directly for the city and a consultant representing developers. I had an opportunity to sit down with Turlock's city surveyor, Rich Fultz, to ask him a few questions about his professional work.



change orders, and avoidance of monument destruction.

There are many other benefits to a strong city surveyor not directly tied to land parcels and public infrastructure/utilities. We won't list all of these benefits here, but a couple of examples include reduced risks related to geographic hazards, a smoother real estate acquisition/disposal process, and improved relationships with private surveyors, engineers and land developers.

Why Have City Surveyors Been Eliminated?

I hope the first part of this article has made the benefits of a strong city surveyor clear. If there is such a compelling argument to be made for the presence of a strong city surveyor in city government, why are so

many California cities operating without one? (I believe the lack of strong city surveyors has become significantly worse across California in the last decade.)

I believe there are several reasons for the decline in strong city surveyors. The reasons I describe below are based on my own experience working in Central California, but I suspect they would be echoed by other surveyors in all parts of our state.

Reasons for the Decline of Strong City Surveyors

1. Budget constraints: Without a doubt many city surveyor positions have been eliminated in our cities because of budget constraints. My own hometown of Stockton filed for one of the largest municipal

bankruptcies in U.S. history after the total collapse of our local housing market. In those dire financial circumstances, even the relatively small savings of the annual salary and benefits of eliminating a city surveyor become a reality. That has happened in Stockton. Our city surveyor position was eliminated and has yet to be replaced, even as the local economy slowly returns to health.

2. GIS Technology: GIS technology has made it easier and easier to obtain land records and other geospatial data. Overall, this is a positive change, with GIS becoming a powerful tool for people across the departments of municipal

continued on page 15

house. The collaboration inside and between city departments makes our projects more efficient. We have some very qualified engineering and land surveying firms on a retainer agreement. However, use of those consultants doesn't take us out the project. We need to stay involved in the project and oversee the work of our consultants to make sure the project stays on track and keep things from falling between the cracks.

There is also the question of complying with all the laws that regulate the land surveying profession. By my involvement in the profession with CLSA and groups such as our Central Valley City/County Land Surveyor's Forum, I keep the City of Turlock informed of issues centered on land surveying. Staying informed of changes in legislation and knowing about pending future legislation is important. It is critical that the agency is aware of changes such as legislation that extends the life of tentative maps. I believe it is the agency's responsibility to track the life of the maps and inform the applicants of the potential expiration dates. One of the most noted laws recently was Senate Bill 1467 which took effect January 1, 2015. I know many agencies have not taken any action to comply with this legislation. I took this legislation and

what it meant to the City of Turlock very seriously.

A great example of the legal aspects of a city surveyor role is when my name was placed on the Board form "Notice of Department Designation" as being the person responsible for all land surveying activities within the City of Turlock. This meant I needed to establish a process to ensure monument preservation activities were going to occur in compliance with 8771. I am proud to say, the City of Turlock has implemented processes to ensure our compliance. I have been asked how our monument preservation process could be utilized by an agency with a contract Land Surveyor. It probably could be completed by a contract land surveyor, but it would not be very efficient. I cannot imagine how a contract land surveyor could have an adequate contract to ensure monument preservation compliance across all of a city's activities.

Filling the role of a city land surveyor on staff with an agency comes with responsibility, but it also comes with the authority to fulfill the role. A contract land surveyor doesn't have the same level of authority when it comes to establishing and refining agency processes.

What is your biggest challenge as a city surveyor?

I think the biggest challenge for me has been patience. I came to Turlock from a background the private sector, where you need to get things done now. City government doesn't change as quickly. This took some adjustment. I know a lot of great land surveyors in our profession are not all cut out to work for an public agency. Public agencies are large organizations with a lot of moving parts. In a public agency it is important to be patient, follow existing processes, and make certain all points of interests are considered. The City of Turlock is still somewhat of a small town environment. I have enjoyed the luxury of a having a solid working relationship with others with a similar mind set. You may have noticed I refer to "we" frequently. I firmly believe that the success of the City of Turlock Land Surveying is a result of a team.

What do you want surveyors and civil engineers in private practice to understand about your job?

I want the private sector professionals to understand that I consider myself part of the team. I have worked on your side of the counter and understand frustrations with agencies.

The agencies do not prosper without a strong economic development. If we have a process in place that is causing grief to the private sector, I will be encouraged to address the issue. Sometimes our processes are dictated by the regulations of other larger agencies and change is impossible. We do need to understand and be able explain our processes. Any person in the role of a city land surveyor needs to willing and able to play their part.

The other thing I want the private sector Land Surveyors and Engineers to understand, is my focus to promote our profession. The land surveying profession has not done a good job of promoting ourselves. We need to find ways to educate others of the importance of land surveying every opportunity we have.





government. However, a hidden danger of this technology is a misunderstanding and misuse of GIS data. In many cases, elected officials and city government professionals believe GIS data can quickly replace the work of a qualified land surveyor. (This reminds me of the time when a supervisor of my local county asked a representative of our local CLSA chapter why a monument preservation fee was needed when all of the parcel boundaries in the county were visible on Google Maps.) Despite the consequences, there is a temptation to replace the activities of the city surveyor with a software stack from ESRI. (In many cases, the information technology department is more than happy to assume the additional responsibilities and funding.)

3. Lack of Mutual Professional Respect: Perhaps the most powerful reason for the decline in strong city surveyors is the lack of mutual professional respect between land surveyors and civil engineers. Most cities do have a licensed civil engineer working in a role as public works director. Most cities also have a land planner working in the role of community development director. In many cases, these other professions lack a basic understanding of the land surveyors role in society, view the work of the land surveyor as a necessary evil, or believe the work of land surveyor can be performed by junior technical staff at a fraction of the cost. When civil engineers and land planners hold positions of authority in city government and harbor these beliefs about land surveying, they can easily lobby to eliminate the city surveyor position or neuter its effectiveness. (If you don't think this is a real problem, talk to surveyors in public practice that have tried to implement real monument preservation programs in their agencies.) This problem won't be fixed until we can educate elected officials and other professionals

in city government about the appropriate role for a strong city surveyor and the benefits that a strong city surveyor brings to city government.

Moving Forward

I'm optimistic that organizations like CLSA can work to add strong city surveyors across California, and to support them once they are in place. The retirement of the baby boomers, including civil engineers licensed before 1982, provide an opportunity to move more licensed land surveyors into the high levels of municipal government. If we fail as a profession to advocate for stronger city surveyors, our city governments and our urban citizens will suffer. Tax dollars will be wasted. Opportunities to realize efficiency and to improve the operation of city government will be squandered. A strong city surveyor can play a critical part in affordable and effective city government. Our profession brings great value to many aspects of city government.

Volunteer for Strong City Sureyors

If you are interested in helping draft a template job description for strong city surveyors, or are interested in working more on this issue, please reach out to me by e-mail at landon.blake@redefinedhorizons.com.

Learn More

You can read more about issues related to the role of land surveyors in government at www.redefinedhorizons.com/printingpress/public-surveyors. Recently posted content includes short articles entitled "The Problems With Alternatives to Strong City Surveyors" and "The 5 Worst Mistakes You Make In Your RFP for Land Surveying Services." You also find infographics related to the content in this article at that link. You can subscribe to Landon's free online newsletter for the improvement of land surveying organizations (the *On Point* Newsletter) at www.redefinedhorizons.com/printingpress/subscribe. The *On Point* Newsletter includes content to help improve surveying activities at government agencies. 🌐

Kid's Corner

From Chuck Pugh:
My daughter Emma (11)
and son Ethan (9)
running the show while
on summer break!





Lewis & Lewis Enterprises since 1953

SERVING the Land Surveying Profession for "63" years

From our days as: Land Surveyors – Offshore Surveyors – Navigators

To: Offering a complete line of Quality Land Surveying Products

The Goal: Quality Service & Support

"3" Generations R.B. "Mr" Lewis LS 1770 – R.T. "Bob" Lewis LS 2777 – T.R. "Tom" Lewis

63

1953-2016



- GPS
- Robotic Total Stations
- Total Stations
- Data Collectors and Controllers
- Automatic Levels
- Laser Levels
- Transits

Accessories & Supplies

Toll FREE (800) 235-3377

Email: sales@lewis-lewis.net

GR-5 GNSS



Receivers & Systems

NEW LN-100



3D Layout Navigator

PS and DS



Robotic Total Stations

SALES, RENTALS & FINANCING

**NEW, DEMO & USED
Instruments
Accessories & Supplies**

Coming Soon... www.lewis-lewis.net

Stay tuned for future developments and improvements

SPECIALS



FOCUS 35
Robotic
Total Stations

RANGER 3
Data
Collectors &
Controllers



SP80
GNSS
Systems
&
NEW
SP60



NIKON NIVO
Reflectorless
Total Stations

NEW
NOMAD
1050
Collectors &
Controllers



Spectra Precision
Tripod Data System

Nikon

Ashtech



VENTURA

1600 Callens Rd.
Ventura, CA 93003
(805) 644-7405 (805) 642-3970 fax

ESCONDIDO

540 So. Andreasen Dr., Suite A
Escondido, CA 92029
(760) 747-8823 (760) 480-5778 fax



Commercial Use of Drones in California

By Landon Blake,
Redefined Horizons

When providing professional land surveying services to a client, whether a public entity or a private company/individual, licensed land surveyors need to be sure that all subcontracted small unmanned aircraft (“UAS” or “drone”) owners and/or operators (or the land surveyor if they own and operate their own drone(s)) are fully compliant with the current United States Department of Transportation’s Federal Aviation Administration (“FAA”) regulations before beginning work on a project. To assist in this endeavor, below is a summary of the current requirements and available resources (in footnotes) where drone owners/operators can obtain necessary registration information and statutory/regulatory authority.

Please Note: FAA regulations are continuing to evolve regarding this new technology. Any UAS owners/operators will be required to comply with all *current* federal statutes and regulations regarding the operation of UAS (drones). Drone owners and operators should confirm current statutes and regulations before operating a drone for commercial purposes, as the information contained in this article may have changed.

1 Drone Registration Requirements

The FAA has put several rules and regulations into place regarding the use of small unmanned aircraft, also referred to as “UAS” or “drones,” weighing more

than .55 pounds (250 grams) and less than 55 pounds (250 kilograms), including those with payloads such as on-board cameras.¹ One such rule requires registration of these aircraft on a user-friendly web-based system that can be accessed at www.faa.gov/uas/registration.²

Registration is a statutory requirement that applies to all aircraft – any owner of a small UAS who had previously operated an unmanned aircraft exclusively as a model aircraft prior to December 21, 2015 must have registered the aircraft no later than February 19, 2016.³ Those UAS purchased after December 21, 2015 must register before their first flight outdoors.⁴ Upon completion of registration, the web application will generate a Certificate of Aircraft Registration/Proof of Ownership that will include a unique identification number for the UAS owner, which must be marked on the aircraft.⁵ The FAA has expanded this system for use in connection with a business.⁶

2 Valid U.S. Drone Operation for Commercial Use – Three Step Process

Because the federal government has exclusive sovereignty of the airspace in the United States and the FAA sets all standards for flight safety, it preempts the entire field from state and local regulation.⁷ Valid UAS/drone operation **for commercial use** involves a three step process.⁸

A. The owner must apply for and receive an “**N-number**” aircraft registration for the drone (the same as if it were a full sized aircraft).⁹ See Section 1 above.

B. Since full size passenger aircraft are subject to stringent airworthiness and inspection requirements that are unnecessary for drones, the owner of a drone for commercial use must obtain a special “Section 333” exemption.¹⁰

1 The Section 333 exemption requires detailed information about the specific drone and the pilots who fly the drone.

a Only a pilot with a Remote Pilot Airman Certificate, or a pilot under the direct supervision of a person who holds a Remote Pilot Airman Certificate is permitted to fly the drone under Section 333.

b Each petition for a Section 333 exemption is carefully scrutinized. The turn-around time is approximately six (6) months.

C. The owner of a drone must obtain a “Certificate of Authorization or Waiver” (“COA”) to fly in specifically airspace.¹¹ The COA application can be submitted at the same time as the Section 333 application. If the operator never flies the drone more than 200 feet above the ground, no separate COA

continued on page 18



application is needed since every Section 333 exemption comes with an automatic COA for flights up to 200 feet.¹²

As a practical matter; however, any commercial organization or individual who owns a drone must obtain an N-number, a Section 333 exemption and a COA in order to fly it.

3 Additional FAA Regulations for Commercial Use Drones

In addition to these three steps, anyone flying a drone for commercial purposes must also comply with federal aviation safety regulations.¹³ Other FAA regulations include the following:¹⁴

- An operator may only fly a drone within visual line of site.
- An operator may not fly a drone within a 500 foot radius of anyone who is not part of the operation of the drone.
- An operator may not fly a drone at night (Visual Flight Rules). A drone may be operated during twilight if the drone has anti-collision lights.
- An operator may not fly a drone within 5 nautical miles from an airport having an operational control tower; or three nautical miles from an airport with a published instrument flight procedure (but not an operational tower); or two nautical miles from an airport without a published instrument flight procedure or an operational tower; or two nautical miles from a heliport with a published instrument flight procedure.
- An operator may not fly above 400 feet.

See Exhibit A, FAA News, Summary of Small Unmanned Aircraft Rule (Part 107) (June 21, 2016).

4 Insurance

The FAA does not require private aircraft owners to carry insurance.¹⁵ Nevertheless, there is an increasing demand and need

for insurance for commercial drone operations – coverage is typically for legal liability, physical damage and/or product liability.¹⁶ As a condition of operating a UAS, the public entity or private company/individual should require owners/operators to provide a certificate of insurance (insuring for legal liability, physical damage and product liability) naming the public entity or private company/individual as an additional insured.

5 Sample Letter

A sample letter to send to a UAS owner/operator can be found at: www.californiasurveyors.org/favforms.html. This letter contains the requirements outlined herein and an attachment with additional FAA requirements. This letter can be altered to make it from a public entity/private owner to a UAS owner/operator or from a land surveyor to a subcontractor UAS owner/operator. 🌐

Endnotes

- 1 Federal Aviation Administration, Press Release – FAA Announces Small UAS Registration Rule (December 14, 2015).
- 2 Id.
- 3 Id.
- 4 Id.
- 5 Id.
- 6 Id.
- 7 Ellis, Robert L., Drones & the Law, What You Need to Know, 27 May S.C. Law 42 (May, 2016).
- 8 Id.
- 9 Id. (citing 49 U.S.C. § 44711 and 14 CFR Part 47 requiring all non-recreational UAS operators to register their aircraft via form AC Form 8050-1). Failure to register an aircraft may result in regulatory and criminal sanctions. The FAA may assess civil penalties up to \$27,500. Criminal penalties include fines of up to \$250,000 and/

or imprisonment for up to three (3) years. Federal Aviation Administration, UAS Registration Q&A, No. 12 available at www.faa.gov/uas/faqs/#reg.

- 10 Id. (citing FMRA § 333, Special Rules for Certain Unmanned Aircraft Systems; 14 CFR § 11.81). See also Andeline, Eric, 10 Things to Know When Applying for a Section 333 Exemption (October 16, 2015) available at www.lidarmag.com/content/view/11566/198/.
- 11 Id. The process can be initiated online at <https://oeaaa.faa.gov/oeaaa/external/uas/portal.jsp> (account required).
- 12 Id.
- 13 Id.
- 14 Id. See also Federal Aviation Administration, FAA Doubles “Blanket” Altitude for Many UAS Flights (March 29, 2016); Federal Aviation Administration, Press Release – DOT and FAA Finalize Rules for Small Unmanned Aircraft Systems (June 21, 2016). See also Exhibit A available at www.faa.gov/uas/media/Part_107_Summary.pdf.
- 15 Ellis, Robert L., Drones & the Law, What You Need to Know, 27 May S.C. Law 42 (May, 2016).
- 16 Jeremiah Karpowicz, FAA Drone Regulations – What You Need to Know Before Legally Flying a UAV, Commercial UAV News (June 1, 2016).

Santiago Canyon College
SURVEY/MAPPING SCIENCES PROGRAM



Preparing for California LSIT or LS exams? Need to upgrade your skills? New surveyor? We offer:

- Affordable classes with certified instructors
- Survey/mapping certificate and degree programs
- Computer labs equipped with GPS, ESRI-GIS, and AutoDesk software
- Total Stations and GPS for field exercises
- Online and evening classes available
- Career training for new surveyors

For more information call (714) 628-4883 or visit www.sccollege.edu/survey

 **Santiago Canyon College**
 8045 East Chapman Avenue
 Orange, CA 92869

THE NEW DRONE LAWS: What You Need to Know



By Logan Campbell
and Daneil Katz, Aerotas

On August 29 the FAA's new commercial drone law, known as Part 107 or the "Small UAS Rule," officially went into effect. This day marked a significant transition: the prior regulatory regime required receiving a cumbersome special exemption from the FAA, and included restrictions that made using UAVs infeasible for most surveyors. Under the Small UAS Rule, however, it is realistic for nearly every survey business and public agency to use drones legally. The Small UAS Rule does still include a number of rules and restrictions, and successfully using a drone requires a thorough understanding of the law. In this article, we cover the key provisions of the Small UAS Rule, and what they mean for surveyors.

The Basic Restrictions

The Rule applies to UAVs up to 55lbs. The Small UAS Rule was so named by the FAA because it applies to drones the FAA considers "small:" 55 pounds or less. In practice, this will not restrict surveyors, as most mapping drones weigh between two and ten pounds.

Maintaining visual line of sight is required. Under the new Small UAS Rule, the drone must always be within unaided sight of the pilot, or a visual observer who is in direct contact with the pilot. Maintaining a drone within sight is heavily dependent on multiple factors; in real world conditions, the maximum area that can be covered while maintaining line of sight is around 70 acres.

Flights must be during daylight. Daylight hours are defined as 30 minutes before sunrise until 30 minutes after sunset. Given that most surveyors will use drones carrying standard cameras – as opposed to LIDAR – and use photogrammetry to create maps, this limit does not present much of an impediment.

The maximum altitude allowed is 400 feet above the ground. In our experience, in order to achieve sufficient resolution and map accuracy, most surveyors will want to fly around 150 to 200 feet above ground level. However, the 400 foot restriction does limit the opportunity to maximize ground coverage by flying higher.

Operations near airports are restricted. Operating a drone near an airport is tightly restricted under the Small UAS Rule. The distance that a drone operation must stay away from an airport depends on the type of airport, but there are a number of mission planning tools and services that make it easy to check that a planned operation is in clear airspace.

Flying over non-participants is not allowed. The Small UAS Rule prohibits flying over people not directly participating in the drone operation. The FAA provides a very narrow definition of who it considers to be "participants," effectively limiting it to the pilot, crew, and any visual observers aiding in the flight. Flying over moving vehicles is also expressly prohibited. This rule does present challenges for surveyors looking to map roadways or public spaces by drone.

Becoming FAA Certified

The Small UAS Rule requires would-be commercial drone operators to become certified before they are able to legally start flying. Drone operators must be at least 16 years old, and must pass a knowledge test and a TSA background check. The FAA drone test (www.aerotas.com/blog/2016/8/29/what-is-the-faa-drone-test-like) is focused on knowledge of fairly technical airspace topics, many of which are unfortunately not very relevant for drone survey operations. It does therefore require moderate study, however with preparation it is realistic for anyone to pass.

Rules Built for Flexibility

One of the most exciting parts of the Small UAS Rule is that it expressly states that nearly every restriction can be waived. The waiver process is still a bit of a mystery, but it appears that the FAA is starting by being conservative with these waivers. For example, at the time of writing, the only company granted a waiver to fly a drone over people is CNN, to fly a small drone on a tether under heavy operational restrictions.

Realistically, the waiver process will be too onerous for most surveyors to rely on in the near future. However, the FAA has signaled that it intends to become more liberal with waivers with time and experience. Most importantly, the waiver provision is an encouraging sign that the FAA is setting

continued on page 20



itself on a trajectory of becoming even more permissive to good operators.

The Legal Caveats

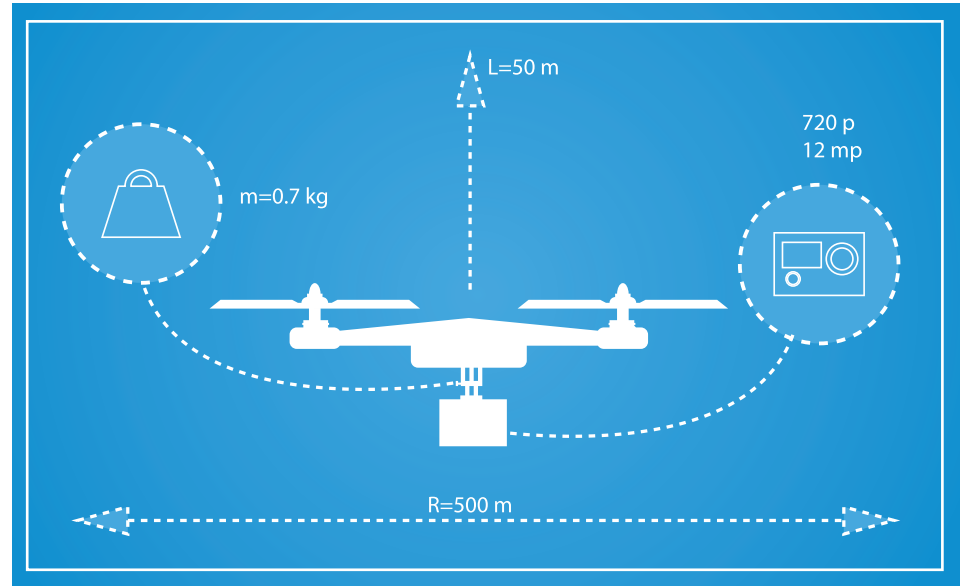
This article obviously does not cover every nuance of the law. Passing the certification test and implementing a drone program that reliably complies with law requires training and support from a credible source. On the whole, this new set of laws is feasible for any credible survey firms to follow. That also means that there is no excuse for operating outside of the law; any organization operating a drone is responsible for the positive future of the entire drone industry.

Flying Legally, and Profitably

With these new rules, operating drones has become a realistic option for nearly every survey business and agency. However, regulatory compliance is just one part of an effective drone program. A profitable,

safe, and reliable drone program requires the right understanding of regulation, as well as technology, operations, training, and insurance. It is possible for a survey organization to navigate the process of building an effective drone program on

its own, but for organizations that prefer a more efficient path, options like the Aerotas Map Package are an excellent choice. Learn more about the Aerotas Map Package at Aerotas.com/CalSurveyor. ☺



Start Mapping by Drone Now

Discover the most cost-effective drone mapping solution

Aerotas.com/Cal • (510) 671-0693

Aerotas

Understanding Survey Error Adjustment (with Open Source Code in Java and Groovy)

By Landon Blake,
Redefined Horizons



Analysis and adjustment of measurement error are critical skills for the land surveyor in modern practice. Despite this, I've always found the traditional textbook materials on error adjustment difficult to understand. I've struggled to wrap my brain around the concepts from statistics and probability that are part of error analysis and adjustment. A couple of things have helped me overcome (at least partly) this challenge to my professional knowledge. One thing was many hours of contemplation and consideration. The other was my slowly improving ability to write software code. I eventually realized most survey error adjustment problems could be solved using the iterative and brute force power of the desktop computer. Thinking about analysis and adjustment of measurement in error put the underlying concepts within my grasp.

This is the first article in what I hope will be a series of articles on the adjustment of surveying measurement error. The target audience for the article series is the working surveyor who would like a better understanding of measurement error and methods of error adjustment that he can apply in his or her own work. The articles won't require a high level background in statistics or calculus. We'll explain all of the more complicated math with simple examples, diagrams, and computer code. (You will need a solid understanding of algebra, basic trigonometry, analytic

geometry and coordinate geometry to get the most benefit from the article series.)

All of the source code we write for the article series will be in the Java and Groovy programming language. Will post all of the source code online, under and open source license. All of the text and media content for this article series will be released under the Creative Commons **Attribution-NonCommercial-ShareAlike 4.0 International** License. This means you are free to distribute copies of the articles.

In this first article of the series we are going to:

- 1) Define a few basic terms about the quality of measurements.
- 2) Describe the basic parts of any survey measurement system.
- 3) Talk about the basic type of errors in a survey measurement system.
- 4) Define some goals for a basic measurement error analysis and adjustment (MEAA) software program.

Measurement Precision, Accuracy and Granularity

In this section of the article we want to define a few terms that describe our survey measurements. This is important because these terms are often confused and used

interchangeably in common language. It is also important to understand the definition of the measurement qualities, because we will want to determine their values as part of our MEAA software program.

The first term we will define is *precision*.

Precision:

The degree to which measurement values are tightly clustered. Measurement values with small differences from one another (or small difference from an average value) are said to be tightly clustered or more precise, whereas measurement values with large differences from one another are said to be loosely clustered, or less precise. As a general rule, more precise measurements are an indication of a measurement system with less error. Precision is typically the most misunderstood of our 3 measurement terms. People will say precision when they mean accuracy, or will confuse precision when they mean measurement granularity. As a general rule surveyors prefer more precise measurements.

Example:

The distance measurements in the first set below would be imprecise (compared to the second set below) when considered at the hundredth of a foot level of granularity. This is because there is a relatively large spread between the distance values when compared to the second set:

continued on page 22



101.23 Feet	101.05 Feet
100.86 Feet	100.74 Feet

The distance measurements in the second set below would be precise (compared to the first set above) when considered at the hundredth of a foot level of granularity. This is because there is a relatively small spread between the distance values when compared to the second set:

101.232 Feet	101.231 Feet
101.230 Feet	101.233 Feet

The second term we will define is *accuracy*:

Accuracy: The degree to which an observed measurement value varies from the true value for a measurement. An observed value that is closer to the true value is considered to be more accurate than a value that is farther from the true value. The required accuracy values of a measurement typically depend on the way in which the spatial data created from the measurements will be used. More critical applications of spatial data require more accurate measurements. Accuracy can be difficult to determine in many situations because the true value for a measurement is unknown. As a result, precision is often used as a substitute for accuracy when considering the quality of measurements. (There are certain rules of geometry that do allow us to calculate accuracy. For example, we know that the 3 interior angles of a triangle should sum to exactly 180 degrees. We will discuss these type of geometry rules more later.)

If the true value of a distance is 100.00 feet, the second set of measurements below would be considered more accurate than the first set of measurements below:

101.01	101.02
100.98	100.99
101.32	101.31
101.30	101.29

The third term we will define is *granularity*.

Granularity: A description of the size of the smallest unit of measurement with which a measurement is made. A more finely grained measurement has a smaller

unit of measurement than a more coarsely grained measurement. The granularity of a measurement is typically constrained by the type of instrument used to make the measurement observations.

Granularity is often confused with precision. But they are not the same thing. You can make highly precise but course grained measurements. You can also make imprecise but finely grained measurements.

Example:

The following distance measurements would be considered precise but course grained:

50.1 Chains	50.0 Chains
49.9 Chains	50.2 Chains

The following distance measurements would be considered imprecise but fine grained:

101.232 Feet	101.054 Feet
100.867 Feet	100.742 Feet

The following distance measurements would be considered precise and fine grained:

101.232 Feet	101.231 Feet
101.230 Feet	101.233 Feet

Granularity of measurements can be visualized with a couple of examples.

In the first example we want to measure the volume of several large glass jars. We can do this by filling each jar with marbles, and counting the marbles. A larger jar will hold more marbles. If we shrink the diameter of the marbles we use to measure the volume, our measurement becomes finer grained.

In the second example we can use a more familiar tool to most land surveyors, the engineer’s measuring scale (or ruler). A scale with ticks to the nearest inch will create a courser grained measurement than a scale with ticks to the nearest 100th of an inch.

As a general rule, surveyors prefer finer grained measurements to courser grained measurements. However, there is a danger

with digital technology that our hardware and software will report a more finely grained measurement value than it can practically measure. This is like reporting the volume of a glass jar to the nearest 1/100th of a marble or a distance on a map to the nearest 10th of an inch with a measuring scale only marked to the nearest inch.

A Note on Analyzing Measurement Quality

We should make a quick note about analyzing measurement quality. As a general rule, when we talk about the precision, accuracy and granularity of measurements we need to be comparing one set of measurements to another set. It doesn’t make sense to say that a measurement set is “highly precise,” “highly accurate” or “very fine grained” unless we are comparing it to another measurement set.

Example:

Consider the list of distance measurements in chain units from above:

50.1 Chains	50.0 Chains
49.9 Chains	50.2 Chains

Is this measurement set highly precise? Is it highly accurate? Is it very fine grained? The answer to these questions isn’t logical unless we are comparing this set of measurements to another set. Precise in relation to what? Accurate in relation to what? Fine grained when compared to what?

Are we comparing this measurement set to another set of measurements in chain units? Are we comparing this measurement set to another made in hundredths of a foot? Are we comparing measurements made with an actual chain to measurements made with an electronic distance meter? We need to compare at least two (2) measurement sets and consider their metadata before we can properly answer these questions about the level of precision, accuracy and granularity of our measurements.



We've just defined three important terms related to the quality of measurements. Now we want to talk about the parts of a typical survey measurement system.

Parts of the Survey Measurement System

What are the parts of the typical survey measurement system? We need to identify and understand these parts if we are going to have a good handle on survey error analysis and adjustment. For the purposes of this article series, we can state the typical survey measurement system has 6 parts:

- 1) The observer.
- 2) The observation instrument.
- 3) The observation.
- 4) The observation environment.
- 5) The observation error.
- 6) The measurement.
- 7) The measurement error.
- 8) Calculations.
- 9) Calculation errors.

The observer uses the instrument to make an observation. Each observation has an observation error. This observation error is typically related to either the operator, the instrument, or the measurement environment. One or more observations can be used to calculate a measurement. Each measurement will have a measurement error that is related to errors of the observations used to make the measurement. Measurements can be combined and used in calculations. The result of calculations may be other measurements. Calculations may also have errors.

Observation errors and measurement errors can be grouped into three main categories. We will discuss those in the next section.

Types of Errors

We can group our errors into 3 broad categories:

- 1) *Systematic Errors* are caused by problems with our measurement system. They are typically consistent and of the same absolute size or proportional size. An example of a systematic error is an EDM that consistently reads distances longer than they actually are because it is out of calibration. This type of error could be a fixed amount for each distance, or a proportional amount that grows with the length of the distance being measured. Systematic errors tend to accumulate into large overall errors visible in the resulting measurements or calculations.
- 2) *Blunders and Mistakes* are usually caused by the measurement operator, although they may be caused by the measurement system or measurement environment in rare cases. Blunders and mistakes can be large. (If repeated consistently, a blunder could become a systematic error.) An example of a blunder is a surveyor that flips the digits on a level rod reading when recording the reading in his/her notebook.
- 3) *Random Errors* are usually small errors caused by the granularity of the measurement, imperfections in the instrument, or variations in the conditions of the measurement environment. An example of a random error is the misreading of a level rod by a hundredth or two because of heat shimmer. Random errors tend to cancel each other out. For example: You are as likely to turn an angle on a total station 5 seconds too large as you are to turn the angle 5 seconds too small.

In a future article we will discuss methods to detect and adjust the errors in each of the three (3) categories. We will also show how random errors are distributed along the geometric shape known as the "bell curve." Now let's turn from our discussion of errors, and talk about goals for the MEAA software we want to create as part of our article series.

Goals for the Survey Measurement Analysis and Adjustment Software

Now that we've got a basic understanding of survey measurement errors, what initial goals do we want to set for our MEAA software? Here is a short list of initial goals:

- Detect and identify all 3 types of errors (systematic, blunders, and random).
- Analyze measurement qualities (precision and estimated accuracy).
- Identify observation, measurement or calculation outliers. (Data points that don't fit well with their neighbors.)
- Perform fixed and best fit error adjustments.
- Create basic error analysis and adjustment reports.

Conclusion

In this article I defined three (3) terms related to measurement quality and talked briefly about analyzing measurement quality. I also discussed the basic parts of a survey measurement system and the three (3) main categories of survey measurement errors. I finished by sketching out some goals for our MEAA software.

In the upcoming articles for this series I will talk briefly about methods to identify the 3 types of errors. I will also describe the differences between fixed adjustment methods and best-fit adjustment methods. Then I will show how random errors are distributed along a bell curve.

I've written some Java source code that corresponds to the concepts laid out in this article. This source code will serve as the basis for our MEAA software. If you'd like to see the code and learn more about the programming of the MEAA software, visit the following link:

<https://app.assembla.com/spaces/surveyos-main-code-repo/subversion/source/HEAD/trunk/sandbox/meaa/src>

Learn More

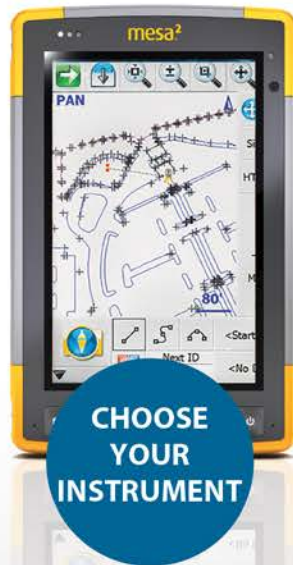
You can read more about survey error adjustment at www.redefinedhorizons.com/printingpress/error-adjustment.



ALLEN PRECISION EQUIPMENT

The Online Marketplace for Surveyors, Engineers & Contractors

MicroSurvey Mesa 2 FieldGenius Premium Bundle



OUR SPECIAL APE PACKAGE INCLUDES:

Leica TS12P

Leica TS12P uses years of experience to optimally find, lock and measure to prisms with a single key press. With the unique PowerSearch sensor any prism type is found within seconds regardless of location.

- Available in 2", 3" and 5" Models
- Long Range Bluetooth
- 400 M Reflectorless Range
- PowerSearch — Finds any prism type in seconds

STARTING AT
\$461²⁸ PER MONTH



MicroSurvey Mesa 2 FieldGenius Premium Bundle

- **Code-free linework:** Linework is created automatically without entering codes and is instantly displayed, eliminating the need for a separate sketch. No need to connect the dots back at the office.
- **Advanced display with high-def graphics and intuitive interface:** FieldGenius is laid out with logical icons, customizable toolbars, smart objects and easy to use GPS and total station controls.
- **Easy stakeout:** Choose between graphical compass, grid, and map staking modes to easily stake out points. Viewing direction can be adjusted based on your preferences.
- Long-range Bluetooth® Smart Ready wireless technology, v4.0 +EDR, Class 1.5, BLE support
- Wi-Fi 802.11 a/b/g/n, 2.4 GHz and 5 GHz
- IP68 waterproof and dustproof
- Microsoft® Windows 10
- Active viewing area: 7" (178 mm)



GeoMax Zoom 90

Zoom90 is the ultimate one-man system with up to 20% more automation performance.

- Available in 1" , 2" and 5" models
- Long Range Bluetooth
- Ultimate one-man system
- Complete Windows CE Functionality
- Full VGA Display

STARTING AT
\$424⁷³ PER MONTH



CALL TODAY!
1-800-241-6223

A Review of IBLA 99-363 — (part 1)



**By Landon Blake,
*Redefined Horizons***

In this article we begin a review of Case 99-363, decided by the Interior Board of Land Appeals. In this case three (3) landowners (referred to in this article as “Simpson”) appeal a dependent resurvey of a Colorado township containing their land. The decision in this case has important lessons about evaluation of evidence, protection of private property rights during a government resurvey, and the fairness of the double-proportion method of lost corner restoration.

In this first article, we will consider the IBLA’s decision on three types of evidence in this case related to the contested section corner:

- 1) Physical evidence.
- 2) Topographic features.
- 3) Oral evidence.

In a subsequent article, we will consider the IBLA’s decision in this case as it relates to private survey maps as evidence and the proper use of the double proportion method of corner restoration.

Before we look at the key legal issues in this case, let’s review the case timeline:

Timeline

6/1882:

GLO Surveyor Nickel surveys the exterior boundaries of the township.

6/1882:

GLO Surveyor Gardner and GLO Surveyor Cleghorn survey the subdivisional section lines of the township.

5/9/1893:

The Surveyor General of Colorado issues the township plat.

1931:

The Colorado Highway Department prepares a map of the subject area.

1958:

The Colorado Highway Department prepares a second map of the subject area.

1978:

Private Surveyor Johnson prepares a survey of the subject area.

1981:

Geoff Engineering conducts a survey of the Delzell property within the township.

1985:

Private Surveyor Schmid prepares a survey of the subject area.

9/16/1985:

San Juan National Forest requests the BLM survey its lands in the township.

5/6/1986:

BLM prepares special instructions for a dependent resurvey of the township.

Unknown:

BLM land surveyor Kohlerschmidt performs a dependent resurvey of the township.

4/19/1989:

BLM approves the dependent resurvey of the township.

5/11/1989:

A plat of the dependent resurvey is filed.

1/12/1998:

Delzell sends a letter to the BLM demanding a return of his lands. The BLM rejects his letter.

4/30/1999:

Delzell, Simpson and Strockland protest the results of the dependent resurvey of the township.

6/18/1999:

The Colorado BLM makes a decision turning down a request to reject the dependent resurvey of the township.

7/8/2002:

The landowners submit a letter to the IBLA requesting the board overturn the Colorado BLM decision.

continued on page 26



8/2/2002:

The denial of the protest to the dependent resurvey of the township is appealed by Delzell.

Key Facts

This is a list of the undisputed key facts listed in the decision that are related to the legal issues we will discuss in this article:

Physical Evidence:

- 1) The original GLO field notes describe the monument set for the section corner common to Section 29, Section 30, Section 31 and Section 32 as a "sandstone" 17 inches by 11 inches by 5 inches, set 12 inches into the ground, with notches as described in the manual of surveying instructions. The stone monument was described as being set in a raised mound of stone.
- 2) The existing stone monument claimed by the private land owners was

physically larger than the stone described in the GLO field notes, with physical dimensions of 24 inches by 7 inches by 5 inches, and was set 12 inches in the ground. There were no evidence of a stone mound in the vicinity of this stone monument at the time of the GLO retracement survey by Kohlerschmidt.

- 3) The existing stone monument had no notches or other markings.

Topographic Features:

- 1) The original GLO field notes called for a gulch, a spring branch and a wagon road on lines connecting to the contested section corner.
- 2) Kohlerschmidt found no evidence of the topographic calls matching those described in the notes that fit with the existing stone monument during his dependent resurvey.

Oral Testimony:

- 1) Kohlerschmidt didn't interview "Thwaits," a former property manager of one of the subject parcels impacted by the section corner location.
- 2) Kohlerschmidt interviewed Johnson, a private surveyor who worked in the area, but didn't ask him about the existing stone monument.
- 3) The BLM didn't hold public meetings with area land owners during the dependent survey process, as required by its own guidelines.

Legal Questions

In this first article we will consider the following legal questions discussed in this IBLA decision:

- 1) Did the BLM land surveyor properly analyze and weigh physical evidence related to the contested section corner?

continued on page 27

X90-OPUS

L1/L2 GPS
Sale \$1,880

Perfect for OPUS
Easy download tool
4-GB Memory
www.x90gps.com

X91+Satel

Network Rover \$6,532
Base + Rover Pair \$12,524

GPS+GLONASS+Galileo+BeiDou,
L2C+L5+L3 enabled
Full GNSS Centric Tracking

i80

Network Rover \$9,020
Base + Rover Pair \$17,060

+1-888-450-4922
x9gps.com



- 2) Did the BLM land surveyor properly analyze topographic features in the original GLO field notes as they related to the contested section corner?
- 3) Did the BLM land surveyor properly collect, review and weigh oral testimony related to the contested section corner?
- 4) What was the standard of evidence the landowners needed to meet to overturn the BLM's decision about the status of the disputed section corner made during the dependent resurvey?

Legal Question #1: *Did the BLM land surveyor properly analyze and weigh physical evidence related to the contested section corner?*

The landowners in this dispute argued the BLM surveyor should have ignored the following discrepancies in the existing stone monument when it was compared to the section corner monument described in the original GLO field notes:

- 1) The difference in size.
- 2) The lack of notches or marks.
- 3) The lack of the stone mound as a corner accessory.
- 4) The difference in the depth the monument was buried. (The GLO field notes described a monument buried to $\frac{2}{3}$ its length, as instructed. The existing stone monument was buried to $\frac{1}{2}$ its length. However, both monuments were buried to a depth of 12 inches.)

The landowners claimed the notches could have worn away, the stone mound had been removed by a previous land owner, and that the differences in size and buried depth were insignificant. (They also claimed the original surveyors incorrectly measured the size of the monument and didn't follow instructions when they buried it.) They claim Kholerschmidt failed in his review of physical evidence related to the section corner monument.

The IBLA disagreed. They found that "the record before us indicates Kholerschmidt made a careful comparison of the 1882 field

notes to the description and dimensions of the stone.... His conclusion that the Stone was not the survey monument is supported by the fact that the stone ... did not have the described notches ore remnants of them on its sides, was physically larger than the record monument and was not alongside or even near a mound of stone." The IBLA also failed to accept the premise the original surveyors disobeyed their surveying instructions, citing a lack of evidence to support that premise.



Legal Question #2: *Did the BLM land surveyor properly analyze topographic features in the original GLO field notes as they related to the contested section corner?*

The landowners claimed the topographic features called for in the original GLO field notes along lines connected to the contested section corner don't fit with the existing stone monument because of site changes. The IBLA doesn't discuss this particular line of evidence in great detail in decision, but it does note the following:

- 1) Kholerschmidt did compare the topographic calls in the original GLO field notes to site topography at the

time of the dependent resurvey, and didn't find a good fit with the existing stone monument or any other location.

- 2) The general site topography at the location of the existing stone monument as it exists at the time of the dependent resurvey drained in the opposite direction of that called for in the original GLO field notes.

The IBLA didn't comment on the lack of a good fit between the topographic calls in the original GLO field notes and the proportioned corner position used by the BLM. I believe the land owners may have had an element of truth to their argument on this particular aspect of the evidence. The site conditions at the time of the dependent resurvey at BOTH the existing stone monument and the proportioned corner didn't fit with the topographic calls in the original field notes. It doesn't appear the IBLA believed this was a fatal flaw in the proportioned corner position, and it clearly didn't ADD weight to the authority of the existing stone monument. (We may have seen more discussion about topographic calls in the IBLA decision if one or more of them had supported the position of the stone monument.)

Legal Question #3: *Did the BLM land surveyor properly collect, review and weigh oral testimony related to the contested section corner?*

The land owners claimed Kholerschmidt failed to properly collect and review oral testimony from area land owners and area land surveyors. This included his failure to interview Thwaits, a former property owner, and his failure to ask Johnson, a private land surveyor, about the existing stone monument. They also claimed he failed to hold public meetings about the dependent resurvey as required by the BLM's own guidelines.

The IBLA acknowledged that Kholerschmidt failed to hold public meetings as required. However, they decided the public meetings wouldn't have changed the ultimate outcome of the BLM's decision about the status of the contested section corner as a

continued on page 28



lost corner, and therefore didn't consider the lack of public meetings as a reason to overturn the BLM's decision.

The IBLA failed to fault Kholerschmidt for failed to interview the property manager, because the land owners didn't provide evidence that Thwait's was available for interview at the time of the dependent resurvey, or that he was even an appropriate witness. They also point out the alleged testimony Thwait's would have offered to Kholerschmidt would have created a cloud on the status of the existing corner monument because of its questionable quality and because it conflicted with testimony of other witnesses provided by the land owners in this case.

The IBLA also found that Kholerschmidt didn't make a mistake when he failed to question Johnson about the existing stone monument. It reached this conclusion because Johnson had told Kholerschmidt the actual section corner was in a significantly different location. It wouldn't be logical for Kholerschmidt to question Johnson about the existing stone monument if Johnson believed it didn't mark the location of the section corner.

Legal Question #4: *What was the standard of evidence the landowners needed to meet to overturn the BLM's decision about the status of the disputed section corner made during the dependent resurvey?*

To establish the status of the contested section corner as existing, obliterated or lost, the BLM has to meet the standard of "substantial evidence." The IBLA explained in its decision that "substantial evidence" is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." This is a lower standard of evidence than the one the landowners had to meet to overturn the BLM's decision about the status of the corner. The higher standard the landowners had to meet was a "preponderance of evidence." To meet this higher standard of evidence, the land owners had to show that the BLM made an "error in the methodology used or the results obtained, or show that the

resurvey was carried out in a manner that did not conform to the manual."

The IBLA had met the substantial evidence standard in its decision about the status of the contested corner, but that the land owners hadn't met the preponderance of evidence standard needed to overturn the BLM decision.

Lessons For Us

What lessons do we find in our first part of this review of the IBLA decision in this case? There are several, and most related to the gathering and evaluation of evidence:

- 1) Carefully compare the physical description found in the record to the physical description of the monument found in your field survey. (In PLSS, this physical comparison includes the monument accessories.)
- 2) Carefully compare the topographic calls in the original GLO field notes to the existing topography around the location of your target corner. (This requires that you obtain a copy of the field notes and that you locate major topographic features along lines connecting to the target corner during your field survey.)
- 3) Gather oral testimony about corner monument locations and authority from local land owners and land surveyors.
- 4) Take good notes! One reason the BLM dependent resurvey wasn't overturned in this case was because Kohlerschmidt had taken good notes that were part of the record considered by the court. These good notes allowed the IBLA to determine that Kohlerschmidt had carefully considered the evidence. Make a note about your evaluation

of evidence in your survey report! (This includes who you talk to during collection of oral testimony, and what you ask them about.)

Conclusion

In the next article we will discuss the IBLA decision as it relates to the evidence provided by private survey maps in this case, their discussion of bonafide rights, and their discussion about the method of double proportioning.

Learn More

You can read more about court decisions related to boundary surveying, land title, land development, land use planning and professional liability at www.redefinedhorizons.com/printingpress/court-decisions. You can subscribe to Landon's free online newsletters for boundary surveying and land use planning at www.redefinedhorizons.com/printingpress/subscribe.

MANAGE YOUR RISK

Insurance Products for the Professional Land Surveyor From Vista International

- ✓ Professional Liability
- ✓ Office Package (Property, General Liability, Equipment)
- ✓ Business Auto
- ✓ Workers Compensation
- ✓ Personal Insurance

CLSA MEMBER DISCOUNT

Vista International Insurance Brokers is the only authorized insurance broker for California Land Surveyors Association

Vista Affinity Group Services
1318 Redwood Way, Suite 250
Petaluma, Ca 94954
Call (707) 796-7180 or (800) 819-8808
www.vistainternational.com
License No. 0E08576



Review of *Brothers, Inc. v Johnson*

By Landon Blake,
Redefined Horizons

In this article we will review a recent court decision in the case *Brothers, Inc. v Johnson*. (The case was decided in August 31, 2016.) This decision comes to us from the First Circuit Court of Appeals (Louisiana). It involves a dispute over a strip of land between the two (2) alternate positions for the section line common to Section 6 and Section 7. This will be the first in a series of court cases we review that involve land surveyors and transfer of title through (or claims of) adverse possession. As we will see in this and the subsequent articles, the land surveyor (and his or her mistakes) can be intimately involved in the issues surrounding adverse possession. I hope our review of these cases will help land surveyors better obtain a better understanding of adverse possession, and avoid creating claims of adverse possession because of sloppy boundary surveying. Before we look at the legal questions raised in this case, let's consider the timeline of events in the dispute.

Timeline

1967:

AJ Parker completes his survey of the subject parcels. His survey places the section line between Section 6 and Section 7 at 77.1 chains north of the south section line instead of 80 chains.

1970:

The Wilkinsons, owners of the south subject parcel, clear timber to the line surveyed by Parker. They placed a barb wire fence on the south side of the north limit of their timber clearing and constructed a drain ditch on the south side of the fence. They ranch cattle on the timber clearing.

1995:

Intercoastal Land, owner of the north subject parcel, sells the parcel to CBC International.

1999:

The Johnsons acquire the south subject parcel from the Wilkinsons as part of a larger 223.76 acre parcel.

2000:

CBC International hires Michael Mayeaux to perform a boundary survey of their parcel. He places the section line between Section 6 and 7 80.0 chains north of the south section line. This is approximately 170 feet north of the section line established by Parker.

2001:

Triche surveys a portion of the south subject parcel as part of a land subdivision. He shows the center of the ditch along the north boundary of the disputed area.

2005:

Michael Mayeaux prepares a map of his retracement survey.

2004:

CBC International files suit against the Johnson's claiming ownership of the disputed area between the section line established by Parker and the section line established by Mayeaux.

2013:

The trial court rules the Johnson's have acquired title to the disputed land by adverse possession. The parties agree to have Triche resurvey the ditch centerline (which will serve as their new common boundary) and to provide new land

descriptions for the subject parcels on each side of the ditch.

Summary of the Dispute

The timeline above reveals the basic dispute in this case. The Johnson's and their predecessor in title have occupied a strip of land approximately 170 feet wide between two (2) surveyed positions of a section line. Both parties agree that the north position of the section line is the correct position. The main dispute is centered on the claim the Johnson's have to the 170 foot wide strip by the doctrine of adverse possession. The owner of the Johnson's parcel north adjoiner, the CBC International, assert the Johnson's have failed to prove adverse possession of the strip.

Legal Questions

This case raises two specific legal questions discussed by the court:

Legal Question #1: *Did the history of the use by the Johnson's and their predecessor in title allow them to claim title to the disputed area by adverse possession?*

Legal Question #2: *Did the trial court correctly determine the bounds of the area covered by the adverse use?*

The broader questions discussed in the court decision for this case might be framed this way:

- 1) What type of historical land use to a disputed strip must be demonstrated to prove adverse possession?

continued on page 30



2) What principles should guide a court’s decision about how to place the bounds of an area claimed by adverse possession?

In its decision, the court also answers these related questions:

- 1) Who has the burden of proof related to land use in an adverse possession claim?
- 2) Does a trial court have to place the bounds of a disputed area claimed by adverse possession in the exactly correct location? If it fails to do this, can its decision be overruled on appeal?

The Appeals Court Decision

Did the history of the use by the Johnson’s and their predecessor in title allow them to claim title to the disputed area by adverse possession?

Let’s first consider the court’s answer to the question about the history of use. At least seven people testified at trial about the use of the disputed area by the Johnson’s and

their predecessor in title. This included two hunters that received permission to hunt on the disputed area and four different farmers who leased the disputed area over a period of 30 years to raise crops and ranch cattle. It also included the testimony of Mr. Johnson, who also farmed the disputed area after he purchased his parcel. Everyone that testified about this use of the disputed area agreed on the location of the boundary as the tree line north of the ditch.

In its decision about the history of use, the court restates a couple of related common law principles. The first is that, once a land owner proves possession of a disputed area at different times, two presumptions can be made. The first is that the land owner possessed the land in the intervening periods. The second is that he intended to retain possession of the disputed area. The only way to overturn these presumptions is to provide direct evidence to the contrary. In this trial, CBC International failed to provide this evidence. Therefore, the appeals court concluded the Johnson’s did have a history of use to

prove adverse possession for the required period of 30 years.

(The court briefly addresses a related questions about the link between the Johnson’s history of use and the history of use by their predecessor in title. It states that under Louisiana law, the Johnson’s could include the use of their predecessor in title with their own use when calculating the use over a 30 year period. This “tacking” calculation didn’t require the land description in the Johnson’s vesting deed to include the disputed area. This is an important side note in this case, as the Johnson’s didn’t have 30 years of continuous use of the disputed area on their own. They needed to include the years of use by their predecessor in title.)

Did the trial court correctly determine the bounds of the area covered by the adverse use?

The second question examined by the court is the determination of the boundary

continued on page 31

SURVEY MARKING PRODUCTS

- SURVEY MARKERS & MONUMENTS
- CONCRETE MARKERS & DRILL BITS
- SURVEY NAILS & WASHERS
- REFLECTIVE TARGETS & PRISMS
- FLAGGING & WITNESS POSTS

Berntsen

FIND US ONLINE www.berntsen.com

CONTACT US BY EMAIL surveymark@berntsen.com

ORDER BY PHONE 877.686.8561

MARKING THE INFRASTRUCTURE OF THE WORLD™ | WWW.BERNTSEN.COM



QUALITY BEYOND MEASURE

EASY ONLINE ORDERING!
Your Satisfaction, Guaranteed.

SURV-KAP.com
SURVEY MARKERS, CAPS AND ACCESSORIES
800-445-5320

SATISFACTION 100% GUARANTEED

of the disputed area by the trial court. (In this case the only line of the disputed area in question appears to be the north line.) Under Louisiana law, the boundary of a disputed area claimed by adverse possession can be defined by an enclosure, or must be determined “inch by inch.” It is easier to establish possession of an area within an enclosure, like a fence.

The trial court determined the north boundary of the disputed area to be the centerline of the ditch (just south of the tree line). CBC International asserted this was a faulty determination, because the ditch and fence didn’t extend all the way across the northern side of the disputed area. It asserted the Johnson’s needed to show the limits of actual use to determine their boundary by adverse possession.

The appeals court disagreed with the assertions by CBC International on this issue. It pointed to clear evidence presented during trial that the tree line closely corresponded to the location of

the ditch. It also highlighted that a number of individuals testified at trial that the tree line was the boundary between the two (2) parcels. Although the appeals court acknowledged there was a small difference between the location of the ditch and the location of the tree line, it was reluctant to overturn the trial court decision over such a small difference. It stated the common law principle that “boundary location is a question of fact ... and the determination of its location by the trial court should not be reversed absent manifest error ... if the (trial court’s) findings are reasonable in light of the record reviewed in its entirety, the court of appeal may not reverse, even if convinced that had it been sitting as the trier of fact, it would have weighed the evidence differently.”

Broader Questions

Let’s now briefly consider the answers to the broader questions we listed that can be drawn from this court decision.

1) What type of historical land use to a disputed strip must be demonstrated to prove adverse possession?

The court heard repeated evidence of use of the disputed area by the Johnson’s or their predecessor-in-title for the required period of time. It concluded it wasn’t necessary for the Johnson’s to show evidence of use for every gap in the required period because of a presumption of continued use. The uses of the disputed area presented at trial included ranching, hunting, and farming.

2) What principles should guide a court’s decision about how to place the bounds of an area claimed by adverse possession?

The decision in this case illustrates a couple of general principles related

continued on page 32



to how a court locates a claim of adverse possession. The first is the deference given to a trial court's factual determination about the location of a boundary. This decision makes it clear it is difficult to overturn this determination on appeal. The second is the idea that closely located lines of occupation may be considered as a single line of possession by the court for the purposes of determining an "enclosure."

3) Who has the burden of proof related to land use in an adverse possession claim?

It depends. This is a simple question with a nuanced answer. Under Louisiana law, the party claiming ownership of the disputed land by adverse possession has the burden to prove the required history of use. However, once the party claiming ownership has proven at least intermittent use, the party seeking to deny a claim of adverse possession has the burden to prove gaps in use or the lack of an intent to continue using and possessing the disputed land.

4) Does a trial court have to place the bounds of a disputed area claimed by adverse possession in the exactly correct location? If it fails to do this, can its decision be overruled on appeal?

No. A trial court's location of a boundary is a factual determination that will be given deference by the appeals court. The trial court doesn't have to select the exact geographic feature that corresponds to an adverse use, especially if parallel geographic features locating use are

close together. In addition, a single feature marking possession doesn't necessarily have to extend across the entire boundary of a disputed area. Other features can be used by the trial court to close any gaps in the marking of a limit of possession.

Unanswered Questions

There are several interesting questions left us by the appeals court. These questions include the following:

- 1) Why did the surveyors (Parker and Mayeaux) disagree on the location of the section line? Did they consider different evidence, apply a different method of retracement, or was the Parker survey clearly in error? The court remains silent on this issue.
- 2) If the Wilkinsons and the Johnsons had relied on a clearly erroneous survey for their possession, would it have changed the result of the decision by the trial court or appeals court? Would CBC International have a good claim for damages against Parker or his company for the incorrect survey that lead to a loss of their property?
- 3) Would the appeals court decision have turned out differently if CBC International could have proved a gap in the Johnson's use of the disputed area? If so, how long of a gap would have been required? Would the appeals court also have wanted to see use of the disputed strip by CBC International and their predecessors-in-title?
- 4) There was ample testimony during the trial over the location of the boundary to the disputed strip as the tree line. If CBC International had shown there was confusion or dispute over the location of the claimed boundary between the parcels, would this have changed the appeals court decision?

Lessons for Land Professionals

This case has a few of important lessons for land professionals. The first is for land surveyors. It is interesting to note in this case that the claim of adverse possession was made possible by what we assume was

an incorrect survey made by Parker early in our timeline of events. The Johnson's predecessor-in-title relied on the Parker survey to begin possession of what they genuinely believed was their property. In essence, this erroneous survey allowed the Johnson's to acquire title to land they didn't own without properly compensating their neighbor. Although many adverse possession cases involve the clear neglect of the landowner who suffers a claim of adverse possession, in this case we can be more sympathetic to CBC International and their predecessors-in-title. They believed the possession of the Johnson's was based on a correct survey made by a competent professional. In this case, their trust in the quasi-judicial role of the land surveyor was betrayed, and they lost property as a result.

The second lesson is for land title professionals. It is clear from this case that a land title problem arose from the result of two conflicting surveys of a common parcel boundary. This reveals the importance of examining the chain-on-survey for a parcel as part of a thorough search for land title issues. It would be interesting to know if CBC International would have a valid claim against title insurance for the loss of a portion of their parcel because of this successful adverse possession claim.

The third lesson is for land owners and their agents. It is clear from this case that when a survey is made of one parcel, that it is prudent for the owners of neighboring parcels to have their own survey, or to have the neighbors survey reviewed. The longer potential errors in an adjoining survey go undiscovered and unresolved, the more painful the ultimate solution is.

Learn More

You can read more about court decisions related to boundary surveying, land title, land development, land use planning and professional liability at www.redefinedhorizons.com/printingpress/court-decisions. You can subscribe to Landon's free online newsletters for boundary surveying and land use planning at www.redefinedhorizons.com/printingpress/subscribe. 🌐

PUBLIC/PRIVATE PARTNERSHIPS IN LAND SURVEYING

The Consequences of Violating Ethical and Legal Boundaries



By Landon Blake,
Redefined Horizons

— Series Introduction —

This is the first article in a new series on the partnership between private land surveying organizations and government institutions that contract for land surveying services. Although the contracting arrangement can bring real benefits to the private sector land surveyor and the tax payer, section of consultant surveying services is an area filled with symbolic land mines. Misconceptions about the requirements of the law and fuzzy ethical boundaries lead to

bad behavior by public agencies and the consultants they hire. This article series will attempt to identify major problems in this area, to dispel myths, to correct misconceptions, and to outline best practices for managing the relationship between government institutions and contract land surveyors. In this first article, we will consider the consequences that result when parties involved in the selection of contract surveying services violate legal and ethical boundaries.

In my career I've seen more ethical violations and law breaking in the selection of contract surveying services for public agencies than I have in any other area of professional land surveying. (This is followed in second place by the violation of laws related to monument preservation, in third place by violations of the law to file record-of-survey maps and in fourth place by the unlicensed practice of land surveying by construction contractors.) This is due in part to my primary work as a contract land surveyor on large public work projects, but my own experience shows the problem is widespread and undoubtedly experienced by other land surveyors in California.

I want to begin this article with three examples of the ethical violations and legal violations we'll discuss in this article. I'll start with the worst example.

A few years ago my company was invited to join three design teams for request-for-

qualifications on a large diameter sewer trunk line project for a city in the California Central Valley. All three design teams were headed by well-known large (national or multi-national) civil engineering firms. After the city reviewed the submitted SOQs, all three of our design teams were included on the list of selected firms to participate in the project. (A fourth design team was selected. It was headed by a local civil engineering firm with in-house surveying capabilities.) The city decided to break the large overall project into four segments because of schedule constraints. Each design team would have an opportunity to be awarded the design of one of the four segments. Each of the selected design teams was asked to prepare a proposal for a specific segment, and to begin negotiations on the fee for design services with the City. Up to this point, all of the selection process had been qualifications based and hadn't violated any provisions of state law. While working to prepare separate surveying proposals

for the pipeline segments covered by each of our three design teams, we were approached with an unusual request. One of our design teams had been asked by the city to prepare a fee estimate for all four pipeline segments. The city indicated to the design team that they could receive all of the work if they kept the design fee under a certain ceiling. The city asked the design team to keep the request to prepare the overall fee from the other design teams. My company was asked to prepare a new fee estimate for the survey of all four segments. After a heated internal debate, we agreed to provide the overall fee estimate for the surveying, but it left a very bad taste in our mouth.

After a large effort to prepare all of the surveying fee estimates and scope-of-services for the design team, we waited for the city to begin negotiations with the selected consultants. To our surprise,

continued on page 34



the city announced they were giving all of the work to the fourth design team headed by the local firm. The fee the local firm provided for all of the work was approximately 50% of the total design fee calculated when summing the fee for each segment submitted by the individual design teams.

All of our design teams were very disappointed, and my company walked away with no work. In the end, I suspect the city had asked each of the four design teams for a fee proposal on designing all four segments, and had played each team against the other to obtain a final fee that I believe was far below what was realistically needed to complete a competent design. In the process, the city seriously damaged the relationship with the three other design teams that had submitted proposals, and certainly strained the trust it had in the private civil engineering and land surveying community. I still wonder what would have resulted in this situation if each design team had refused to violate the Qualifications-Based Selection process by providing an overall fee for the segments on which they hadn't been selected. For at least a couple of those design teams, the desire for extra work or fear of losing future work with the City led them to compromise, at least in a small way, on their own principles. Everyone suffered as a result.

In another example my company was approached by a local city to provide boundary surveying services for an upcoming capital improvements project. We were asked to submit a statement of qualifications and a proposal (with a scope-of-services and fee estimate) for the specific project. The city reviewed our qualifications and proposal, and informed us that notice-to-proceed for the surveying services would be provided after the next city council meeting. Shortly after that city council meeting, instead of receiving notice-to-proceed, we received a new request for proposal on the same capital improvements project, with the scope-of-services we provided included as an attachment. The proposal had been sent to our company and several other surveying companies. At the end of the

new proposal selection process another surveying firm was awarded the work based on the lowest fee proposal, using a project approach and scope-of-services my company had written and included in our original proposal.

In my third example we were approached by a local construction contractor to provide a per monument "bid" for monument preservation services on a city street improvement project. We approached the agency about the request, and explained that there were two major problems with the contractor's request for low-bid unit costs on monument preservation. The first problem was the clear violation of Qualifications-Based Selection for land surveying services. The second problem was the difficulty in providing unit costs for monument preservation when the number and location of monuments to be preserved hadn't been identified by the agency or the contractor. The city responded that they weren't required to follow Qualifications-Based Selection for monument preservation services that fell under the construction contractor's scope-of-work on the project.

All three of these examples illustrate the slippery slope that can be descended by both public agencies and private surveying companies when selecting consultant surveying services for a taxpayer funded project. Now that we've introduced our article with these examples, let's consider specific ways in which legal boundaries and ethical boundaries can be violated during the selection of consultant surveying services by public agencies.

Violation of Legal Boundaries

The violation of legal boundaries in the selection of consultant surveying services by public agencies occurs when the agency ignores or skirts clear requirements of federal law, state law, or local ordinance. Here is my short list of these violations of legal boundaries:

Ignoring the requirements of Qualifications-Based Selection (QBS). In my experience the most common violation of this type of the flouting of qualifications based

selection for land surveying services by public agencies. Every time a public agency requires the submittal of fees (in a sealed envelope or otherwise) as part of the selection of a consultant land surveyor, it breaks state law and often violates similar federal laws. (Public agencies at times claim there is an exemption from QBS for transportation projects with federal funding if the contract is for \$150,000 or less. However, it isn't clear this exemption is present in federal law, and these contracts certainly aren't exempted from QBS requirements under state law.)

Ignoring the requirements of small business enterprise participation or local business enterprise participation. The funding for many public infrastructure projects requires the participation of small business enterprises or disadvantaged business enterprises. These requirements are at times ignored, or are not properly monitored or enforced. I most commonly see this problem manifested when a larger prime consultant places a small business enterprise on a team to win work from a public agency but then fails to provide the required percentage of work to the small business enterprise. Many local government agencies also require the participation of local business enterprises, where the same problem occurs.

Ignoring the practice of land surveying outside the area of competence or by unlicensed individuals. This violation occurs when a government agency awards design contracts to organizations that don't have competent, qualified or licensed professionals on the team for the required activities. I most frequently see this when contractors that don't employ or contract with licensed land surveyors are allowed to handle their own monument preservation or construction layout activities. Public agencies across the state turn a blind eye to this practice, allowing anyone with an RTK GNSS base and rover set-up to perform surveying activities. This type of violation can also occur when GIS consulting companies are allowed to perform work related to the location of parcel boundaries, utilities, and public infrastructure.

continued on page 35



Violation or lax enforcement of prevailing wage requirements. In a desire to reduce the cost of land surveying services a few public agencies will create gray areas around the requirement to pay prevailing wages. They will often do this by refusing to clearly state as part of the request-for-proposal process that payment of prevailing wages are required, or by leaving this up to the “good judgement” of the consultant land surveyors. This lack of clarity most frequently leads to the punishment of ethical land surveying consultants that make a diligent effort to pay prevailing wages to their team members when the law requires.

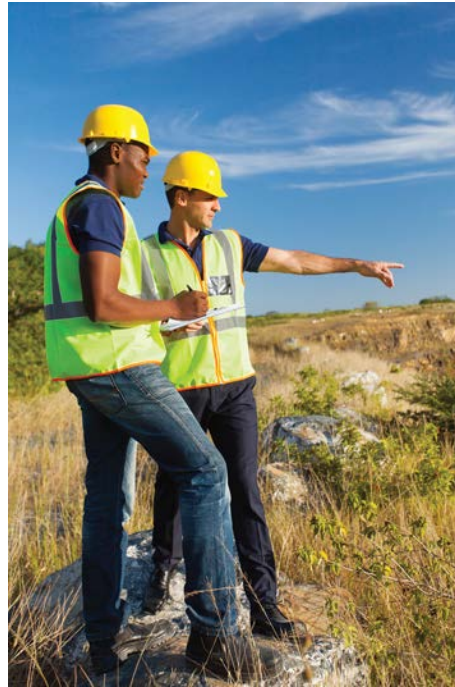
Violation of Ethical Boundaries

The violation of ethical boundaries in the selection of consultant surveying services by public agencies isn’t always as clear cut as the legal violations, but is more prevalent. These types of ethical violations are demonstrated in the examples that opened are article. Here is my short list of violations of ethical boundaries:

Dishonesty about the selection process or the requested scope-of-services. At times, public agencies are simply dishonest about the selection process or about the requested scope-of-services on a specific contract opportunity. This most frequently occurs when a consultant has an “inside track” on a contract and the public agency simply needs to “go through the motions” of the required selection process. It can also occur when the public agency selectively shares information about the actual requirements of a scope-of-services on a project, providing one or more teams with a competitive advantage. (I should also note here that this problem is caused at times, not by intentional dishonesty on the part of the public agency, but by poorly designed and written request-for-qualifications and request-for-proposals (RFP). It may also occur when the agency issues an RFP with one set of intentions, and realizes after receiving the submittals they want a different set of rules to apply to the selection process.)

Lack of mutual professional respect. A lack of respect for the consultant land

surveying community can be shown by public agencies in 3 main ways.



The first way occurs when public agencies issue a request-for-proposal or request-for-qualifications and, after accepting submittals, will cancel the request or will perform a major rewrite of the request. This shows a clear disrespect (or lack of appreciation) for the time and effort the respondents have put into preparing their proposals. The preparation of statement-of-qualifications or proposals by a consultant represents an investment in the relationship with a public agency that often costs thousands of dollars of labor. In rare cases the cancellation or rewrite of request can’t be avoided, but more often it is the result of poor planning or other funny business on the part of the agency. (Members of the consultant community can be involved in this funny business too.)

The second way occurs when public agencies treat land surveying services like a commodity good. I’ve received “bid sheets” or “unit cost requests” for land surveying services from public agencies more times than I can remember. I don’t believe this particular mistake is frequently made out of spite, but out of a basic understanding of the professional role of land surveyors and a misunderstanding that land surveyors can be treated like construction contractors

or the vendor that supply soda to the machines in the employee cafeteria.

The third way occurs when public agencies have a completely unrealistic and unbalanced approach to the way project risk is allocated in either the scope-of-services for a project, the schedule for a project, or their standard contract language for a project. The agencies that show a “consultant takes all risk – agencies takes all upside” attitude demonstrate they aren’t serious about being a good business partner or about cultivating good relationships with the consultant surveying community. Once again, I don’t believe this particular mistake is frequently made out of spite, but is often the result of overly zealous or short-sighted city legal counsel.

Lack of transparency in the selection process. Sunlight is the best disinfectant. This applies to the consultant land surveyor selection process. The following information should always be made publicly available as soon as possible by the public agency:

- 1) The criteria used to select consultant land surveyors.
- 2) The responses submitted by consultant land surveyors as part of the selection process.
- 3) The results of the consultant land surveyor selection process, including any scores or ranks given and the amount of any fee estimates submitted.
- 4) The requirements or standards imposed by the government agency on the consultant land surveyor’s work.
- 5) The review or measure of the consultant land surveyor’s performance under the contract.

I’ve had requests for this information denied by public agencies on multiple occasions. I know other land surveyors who have resorted to Freedom of Information Act requests to obtain this information. There is no excuse for this type of opaque stonewalling by public agency staff

continued on page 36



involved in the selection of consultant land surveyors. If my company has been involved in a fair selection process land surveying services, neither I nor the public agency that acquired my services, should have anything to hide from members of the public or from my competitors.

Consequences of Violations

What are the consequences when public agencies and members of the consultant land surveying community participate in the types of violations we've discussed in this article? I would argue any benefits that are realized are short term, and not worth the long-term problems caused. Here is a short list of the consequences of these violations:

- 1) It contributes to a lack of respect for the law.
- 2) It damages the public agency's relationship with quality consulting firms and may result in the agency only receiving proposals or qualifications from low-quality consulting firms willing to break the law, cut corners, and work for "low bid."
- 3) It leads to a temptation for submitting consulting land surveying companies to cut corners in their work, put their interests ahead of the interests of the tax payer, and to push risk into later phases of a project.
- 4) It leads to a "race-to-the-bottom" in terms of the quality of the services and client care provided to the public agency.
- 5) It spreads distrust and damages the relationships between the consultant land surveying companies. This ultimately harms the tax payers, as it hinders future team arrangements that could bring efficiency and cost savings to projects for the public agency.

Plenty to Talk About

This article has touched on a number of issues and potential problems with the selection of consulting land surveying

services by public agencies. There are a number of other problems the article didn't discuss. In future installments of this article series I hope to take a more in-depth look at these problems. This includes a deeper discussion of qualifications-based-selection, best practices for surveying RFP preparation, and the unique challenges presented by design-build projects. If you have an issue or best practice related to the selection of consultant land surveying services you would like to see discussed in this article, please reach out to me by e-mail at landon.blake@redefinedhorizons.com.

A Resource for Public Agencies and Consultant Land Surveyors

The Qualifications-Based Selection committee of ACEC California is a valuable resource for both public agencies and consultant land surveyors with questions about the rules and best practices related to the acquisition of land surveying services. I encourage you to reach out

to the committee with your questions or suggestions. Members of the committee are often happy to speak about issues related to the acquisition of land surveying services with public agencies and the meetings of professional associations.

Learn More

You can read more about issues related to the role of land surveyors in government at www.redefinedhorizons.com/printingpress/public-surveyors. Recently posted content includes short articles entitled "The Problems with Alternatives to Strong City Surveyors" and "The 5 Worst Mistakes You Make In Your RFP for Land Surveying Services." You can subscribe to Landon's free online newsletter for the improvement of land surveying organizations (the *On Point* Newsletter) at www.redefinedhorizons.com/printingpress/subscribe. The *On Point* Newsletter includes content to help improve surveying activities at government agencies. 📍



ENGINEERING SUPPLY COMPANY

PRECISION POSITIONING SOLUTIONS SINCE 1985

ESC

Call Toll Free: 1-800-788-3307
www.escsurvey.com



MAGNET 3 CLOUD BASED SOLUTION FOR PRECISE POSITIONING

A family of software solutions that streamlines the workflow for Land Surveyors, Contractors, Engineers and Mapping Professionals.

Locations:

2490 Arnold Industrial Way,
Unit P Concord, Ca 94520

4208 North Freeway Blvd.,
Suite 1B
Sacramento, Ca 95834

TOPNET LIVE

ADVANCED GNSS NETWORK SURVEYING, PRICED TO FIT YOUR BUDGET, NOT BREAK IT!

Annual - Monthly - Weekly

GIS
CONSTRUCTION
AGRICULTURE
LAND SURVEYING



BIM SOLUTIONS • UAV • LASER SCANNERS • IMAGING & ROBOTIC TOTAL STATIONS
CONVENTIONAL TOTAL STATIONS, GRADE, FLAT AND INTERIOR LASERS
THEODOLITES • DIGITAL & AUTO LEVELS • FIELD CONTROLLERS • SURVEYING SOFTWARE
GEODETIC & GIS GPS RECEIVERS • GPS NETWORK SOLUTIONS • ACCESSORIES
FIELD SUPPLIES • RADIOS • ADVANCED REPAIR SERVICES • FIELD TRAINING AND SUPPORT



Document Contract Changes



**James A. Anton,
Law Office of James A. Anton**

Reprinted with permission from the author from the September issue of the *Orange County Witness Corner*.

As noted in last month's *Orange County Witness Corner*, all licensed surveyors and licensed civil engineers understand that upon being hired by a client, *B & P Section 8759(a)* requires all them to enter into a written contract with a client to avoid discipline from the Board. *Section 8759* however does not specifically mention anything about changes or modifications to contracts other than the need to document a specific procedure to be followed "to accommodate additional services." Just because there is not specific mention in the *Professional Land Surveyors' Act* of how to handle actual contract changes or modifications in the *Act*, it does not mean that you should ignore the need to document changes, additions and deductions in a written change order to be signed by the parties.

Section 8759(a)(4) addresses the need for the contract to provide a "description of the procedure that ... will use to accommodate additional services." This section requires the survey-or/civil engineer to actually describe in the contract the procedure that will be used to accommodate "additional services." As noted in the prior newsletter, the purpose of this section is to provide the client with a roadmap of how additional services will be addressed so that the client is aware at the time the contract is signed of the potential additional services. The survey-or/civil engineer should spend time drafting the contract to provide an

explanation of potential additional services and how such additional services may be charged. This is important when such additional services may require a record of survey mandated by *Section 8762*.

What *Section 8759(a)(4)* does not address is deductions in scope or changes that do not involve additional services. From years of litigating legal disputes over the terms and conditions of contracts, the court will usually give the benefit of the doubt to the client on contract interpretation. I heard a judge say one time to a contractor that if the work had actually changed to eliminate certain work with the client's approval, then it would have been stated in a contract change order and unless it is confirmed in a contract change order it did not occur. The client will usually receive the benefit of the doubt when a dispute arises over changes in work, changes in scope.

Knowing the importance of contract changes resulting in additions to scope of work, deductions of scope, increased and decreased costs in work and time to complete work, it is always important to document all changes in a written change order to be signed by the client. This will ensure that the client is always aware of the progress of the project and changes. Below are examples of the need to issue a change order. If a change in work involves the need to prepare a record of survey, prepare a change order documenting the change and additional cost for such work.

If the change results in the client asking the surveyor to reduce the scope of work or eliminate certain tasks resulting in a reduced scope of work, then document those changes in a written change order. If the amount of time to complete the work in the contract changes, document those changes in a written change order. Finally, and most important, always get the client's signature on the change order before commencing the changes. The change order will also enable the surveyor to recoup costs for changed work and to minimize the risk of a client asserting that he or she was not aware of the changes, let alone the cost to comply with *Section 8762* dealing with records of survey.

The best advice for changes, additions, deductions and modifications to contracts is to always prepare change orders to contracts to documents changes, additions, deductions or modifications and to obtain the client's signature on a written contract change order before any changes or additions to the work are commenced.

For those of you who do not have legal counsel experienced in this area of the law, please contact the author of this article, James A. Anton of the Law Office of James A. Anton, 7700 Irvine Center Drive, Suite 800, Irvine, CA 92618; 949-753- 2818, james@jamesantonlaw.com to evaluate a situation that may arise in this area of the law. ☺



2017 CLSA Conference – Save the Date

California Surveyors: are you ready to visit the happiest place on Earth? The CLSA 51st Annual Conference in Anaheim/Garden Grove will feature a lot of exciting changes you won't want to miss. Don't worry about your favorite activities – the Golf Tournament, Exhibit Hall, Breakouts, Sunday Night Opening Reception and the Scholarship Auction and Dinner are still around. For 2017, we'll be delivering all of this and more in a streamlined conference designed to give you more bang for your buck.

The host hotels for the 2017 CLSA Conference are the Wyndham Anaheim Garden Grove (formerly the Crown Plaza) and the adjoining Sheraton Anaheim Garden Grove. These modern, four-star hotels are located one mile south of the Disneyland Resort and complementary shuttle service to the parks is included with your stay. All conference activities will take place in the Wyndham and attendees will enjoy plush accommodations and a central Anaheim location from both hotels.

The preconference activities kickoff on Friday, March 24th, with the CLSA Education Foundation Golf Tournament in beautiful Orange County. Tournament Chair, Joe Padilla, promises a terrific course at a great value, with all proceeds going to support college scholarships for California's future surveyors. A post-tournament awards mixer is included with the tournament fee and spouse tickets are available. You don't want to miss this year's tournament.

On Saturday, March 25th, in addition to the traditional full-day workshops, California surveyors will be able to attend a CLSA Board of Directors meeting. With this change, CLSA is bringing transparency in the administration of the Association to the membership. Following the board meeting and the workshops, surveyors are welcome to participate in the always-festive CLSA Education Foundation Bowling Tournament, with proceeds

going to the Foundation's scholarships for surveying students.

The 2017 CLSA Annual Conference program begins the morning of Sunday, March 26th with the traditional opening ceremonies and a general session presentation. This earlier Sunday start allows attendees to get all the education hours from previous CLSA conferences with less time away from work and home. After opening ceremonies, conference attendees will have four separate conference breakout tracks to choose from, with select sessions repeating to give everyone a chance to hear from the top presenters in the surveying industry. After Sunday's sessions conclude, attendees can look forward to the annual Opening Reception in the Exhibit Hall. This year's exhibit hall will be open one less day, but will feature additional events inside the hall, ensuring attendees will get every opportunity to see the very latest in products and services available to today's professional surveyors.

Monday, March 27th offers a full day of breakout sessions featuring blocks of

four concurrent, 90 minute sessions with breaks in-between in the exhibit hall. Monday's lunch will also take place in the ballroom with the exhibits, allowing exhibitors and attendees additional opportunities to interact. Capping Monday will be the raucous CLSA Education Foundation's auction, cocktail party, and dinner – another great event that helps fund educational opportunities for college students studying surveying.

The 2017 CLSA Annual Conference will wrap on Tuesday March 28th with another day of terrific breakout sessions. By concluding the conference on Tuesday instead of Wednesday, California surveyors will enjoy all of the continuing education of previous conferences in one fewer day, saving on hotel and related travel costs and getting you home sooner.

If you have attended previously and are planning to join us again you won't be disappointed. If you have not attended the CLSA Annual Conference and were waiting for the right time, wait no more. We look forward to seeing you March 24th - 28th, 2017 in Anaheim/Garden Grove! ●



Corporate **\$191.00**
 Shall have a valid California Professional Land Surveyors or Photogrammetric license.

CE Corporate **\$191.00**
 Any California registered Civil Engineer who is authorized to practice land surveying pursuant to Article 3, Section 8731 of the PLS Act, and must be actively practicing land surveying. Approved by the Board of Directors.

Affiliate **\$95.00**
 Any person who, in their profession or vocation, relies upon the fundamentals of land surveying. Has no voting rights.

Associate **\$95.00**
 Any person who holds a valid certificate as a Land Surveyor-Training. Has no voting rights.

Out-of-State **\$95.00**
 Any person who resides in a state other than California, who is a member of the other state's Association, and meets the requirements of a Regular Corporate Member. Has no voting rights.

Student **\$19.10**
 A student in a college or university actively pursuing a surveying education. Has no voting rights.

Sustaining **\$385.00**
 Any individual, company, or corporation who, by their interest in the land surveying profession, is desirous of supporting the purposes and objectives of this corporation. Has no voting rights.

First time members must pay a \$25 Entrance fee, lapsed members must pay a \$15 Reinstatement Fee. First year dues are Pro-rated from the date of application.

Member ID	First Name	Last Name	License Number
-----------	------------	-----------	----------------

Home Mailing Address	City, State	Zip
----------------------	-------------	-----

Email	Telephone	Chapter
-------	-----------	---------

Company, University or Firm	Public or Private
-----------------------------	-------------------

Company Mailing Address	City, State	Zip
-------------------------	-------------	-----

Company Telephone	Fax
-------------------	-----

Payment Information Please complete this form and return it with payment to the address above. Please fax this form if paying with a Credit Card

Method of Payment: Visa MasterCard AmEx Check Number: _____

Card Number: _____ Expiration Date: _____

Name on Card: _____

Billing Address: _____

City, State Zip: _____ Signature: _____

CLSA estimates that 20.5% of your total dues is allocated to lobbying and not deductible for income tax purposes as ordinary and necessary business expenses. Contributions of CLSA EF are deductible as charitable contributions.



SUSTAINING MEMBERS



Mike Johnson, LS
Director - Land Survey & Mapping

Corporate Headquarters
3788 McCray Street
Riverside, CA 92506

T: 951.320.6010
C: 951.830.5747



www.webbassociates.com

mike.johnson@webbassociates.com

SUSTAINING MEMBERSHIP

Membership in the California Land Surveyors Association, Inc. as a Sustaining Member is open to any individual, company, or corporation who, by their interest in the land surveying profession, is desirous of supporting the purposes and objectives of this Association. For information regarding Sustaining Membership, contact:

CLSA Central Office

2520 Venture Oaks Way, Suite 150 • Sacramento, CA 95833
916-239-4083 • 916-924-7323 Fax • clsa@californiasurveyors.org



ALLEN PRECISION EQUIPMENT
The Online Marketplace for Surveyors, Engineers & Contractors



Tim Klaben
Marketing Manager

Berntsen International, Inc.
PO Box 8670
Madison, WI 53708-8670
www.berntsen.com
tklaben@berntsen.com

Tel. (608) 249-8549
Fax (608) 249-9794
Tel. (800) 356-7388
Fax (800) 249-9794

Marking the Infrastructure of the World.

SALES • RENTALS • SERVICE • TRAINING



SACRAMENTO • DUBLIN • FRESNO • LAS VEGAS
LOS ANGELES • SAN DIEGO

800.243.1414 • www.csdsinc.com

ENGINEERING SUPPLY COMPANY

THE LEADER IN PRECISION POSITIONING SYSTEMS SINCE 1985

Two Full Service Locations
To Serve You! 800-788-3307

Concord, California
5700 Inhoff Dr., Suite J
W. Sacramento, California
1000 Riverside Pkwy., Suite 100



TOPCON Sales - Service - Training - Rentals

There's No Limit To Your Productivity!
With Quality Topcon Products And World Class Customer Service!

Dan Allwardt, S.E.
Managing Principal
dan.allwardt@kppff.com

O 9167727688
M 9162063615

1508 Eureka Road Suite 290
Roseville, CA 95661



LEJA SURVEYING CORP.

Land Surveying & Mapping • Court Diagrams
Legal Descriptions

Steve Leja
P.L.S. 5933

Telephone (909) 797-3043
Cell (909) 709-6861 • Fax (909) 797-3876
13642 Highland Oaks Dr. • Yucaipa, CA 92399



Quality
Product - Service - Support



Lewis & Lewis

(800) 342-3607

Sales - Rental - Repair - Financing
www.lewis-lewis.net

VENUTRA: 1600 Callens Rd. Ventura CA 93003 (805) 644-7405
FAX (805) 642-3970 Email: sales@lewis-lewis.net
SAN DIEGO: 540 S. Andreasen Dr., Suite A Escondido, CA 92029
(760) 747-8823 FAX (760) 480-5778 Email: jimp@lewis-lewis.net



Seafloor

Manufacturer of the HydroLite-TM & Sonarmite-BT
Hydrographic Survey Systems
Sales • Rentals

Call (530) 677-1019 or visit Seafloorsystems.com
3941 Park Drive, Suite 20-218, El Dorado Hills, CA 95762



SURV-KAP®



THE LANDMARK NAME IN SURVEY PRODUCTS

520-622-6011
1-800-445-5320
FAX: 520-792-2030
www.surv-kap.com

John G. Baffert
President

P.O. Box 27367 • Tucson, AZ 85726 • 3225 E. 47th Street • 85713

Training & Support

Let our technical expertise become your competitive advantage.

The mark of innovative technology is the unique skill and talent necessary for a manufacturer to produce it. In the business of land surveying, this holds true not only for the instruments, but also for the experience and knowledge that the users operating them bring to the job.

At CSDS, our dedicated technical support and training team is committed to ensuring that you get the most from your investment. Our extensive knowledge and experience in the field of geospatial technology allows us to provide you and your crews with the resources necessary to improve your performance both in the field and the office. And because your staff is your company's greatest asset, an investment in developing their skills and expertise is one of the best strategies for your success.

Want to learn more?

Call 916.344.0232 to speak with Terrell Carlton, our Trimble Certified Trainer.

Or, visit: www.csdsinc.com/events to register for our next webinar.



Sacramento
916.344.0232

Dublin
925.960.0323

Fresno
925.275.0513

www.csdsinc.com • support@csdsinc.com

Supporting productivity through innovative technology since 1986™



**CALIFORNIA SURVEYING
& DRAFTING SUPPLY**