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# The California Surveyor

No. 85

The Voice of the Land Surveyors of California

Spring 1987





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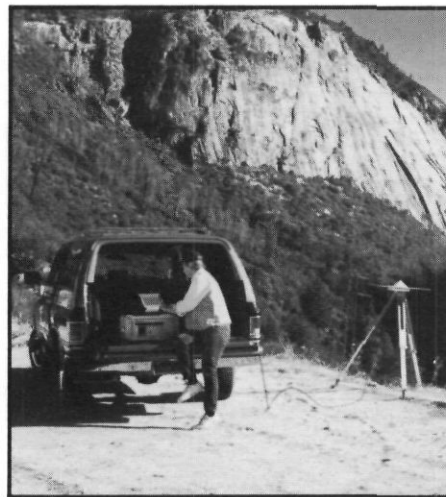
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# Table of Contents

Letters to the Editor	4
Resolution	6
Board of Directors Meeting Minutes	
<i>by Susan A. Jensen, L.S.</i>	8
City of Los Angeles Automated Mapping Layering System	
<i>by Tracie L. Mesloh</i>	12
NCEE to Review "Engineering Surveys" Definition	18
Readers Response Poll on Engineering Surveys	19
Keynote Address at the 1986 ASPRS-ACSM Fall Convention	
<i>Gerald Raymond</i>	20
Purchasing An Established Survey Firm	
<i>by P.J. Stringer, B.Sc., O.L.S.</i>	24
The Ethics of the Low Bid Survey	
<i>by K. Patrick Neill</i>	28

# Advertisers' Index

Bench Mark Co.	30
Brunson Instr. Co.	6
C & R Manufacturing	9
Chicago Steel Tape Co.	14, 18
CIVILSoft	23
CSI Software	21
Geodimeter, Inc.	27
Hadco Instruments	9
Haselbach Surveying Instr., Inc.	17
Industrial Pipe & Steel Co.	9
Kern Instruments, Inc.	16
Langham/Mathis Instr. & Computers, Inc.	7
Lewis & Lewis Enterprises	10, 11
Lou Jones & Associates	29
SERVCO	5, 15, 26
SERVCO-Teledyne National Tracing Paper	22
Trimble Navigation	Inside front cover
Carl Zeiss, Inc.	Inside back cover

**Cover Photo:** Gene Rutledge, CLSA 1987 President, setting up control for hydrographic surveys in the Gulf of Siam during his navy career as Chief Surveyor aboard the U.S.S. Maury.

# The California Surveyor

is the quarterly 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 and Land Surveyors-in-Training in the state of California as well as to all members of 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 the Land Surveyors and their work."

## Personnel

Owner: California Land Surveyors Association, Inc.  
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## 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 the Editor of *The California Surveyor*.

## Editorial Material

All articles, reports, letters and contributions are accepted and will be considered for publication regardless of the author's affiliation with the California Land Surveyors Association, Inc. Contributions submitted on floppy diskette medium is encouraged. For compatibility, the following requirements should be met: 5¼-inch floppy diskette, PCDOS or MSDOS format, ASCII text files, and no formatting codes in the text. Material should be sent to *The California Surveyor*.

## Editor:

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 1023 San Carlos Drive, Antioch, CA 94509

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

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# Letters to the Editor

Dear Editor

Our survey party was hired to reset a section corner in the desert near the Joshua Tree National Monument. The line of sight was crowded with rock mounds, Joshua trees, cacti, and rattlesnakes. Recalling Surveyor Olson's idea about hiring a pilot to fly over the line of sight dropping popcorn kernels, we decided to give it a try. Sure enough, the popcorn popped when it hit the ground and our crew used snowshoes to cover the distance. The only problem we had was that the pack horses we brought with us thought it really was snow and froze to death.

John Ziebarth,

Fountain Valley, CA

□

Dear Editor:

Many people seem to be unhappy with the 1985 Land Surveyor exam results, but, as a grader, not as unhappy as I am. Maybe disgusted or disappointed would be a better description of my reaction.

I read David Eisenberg's letter in the Fall, 1986 issue of *The California Surveyor*, but have waited until after the grading of the 1986 Land Surveyor exam before commenting to see if my reaction would be any different.

Mr. Eisenberg's "informal interviews and polls" may not contain the "factual information" he professes. I get the feeling he talked to a lot of disgruntled people.

"Lack of education and lack of office experience" are *not* the "two main causes for the exam results". Lack of correct answers and a lack of demonstrated knowledge are the "results or lack thereof".

I totally agree with Mr. Eisenberg that "a studious, diligent person . . . can thoroughly educate himself. . ."; but disagree that community colleges provide "more widespread land surveying education with some drop in quality". The community college courses I have taken and have taught require licensure and six year's professional experience; who better to teach the profession than professionals! Courses in surveying not being taught by licensed Land Surveyors should be immediately taken over by them. Every licensed Land Surveyor in the state with any teaching ability should give of his or her time and

talent to pass on what they have learned; to give something back to the profession for all it have given them; to insure quality Land Surveyors for the future; and as a community service.

I'm sorry to hear that large companies keep their best construction party chiefs on construction 95% of the time, but what else would you expect them to do? If construction is their profit point they have to put their best talent to work at what they do best. It's the party chief who has to decide if construction staking is what he or she always wants to do. Career planning and major career moves are the responsibility of the individual.

Candidates who work for smaller firms and supposedly get broader experience may still be too specialized without knowing it. Do they really get enough exposure to all facets of surveying? Maybe limited contacts preclude knowing what to study for the exam. What better reason to become active in a professional organization!

Maybe even the ten students who met on Saturdays during the Summer months in preparation for the exam could have been innocently misguided in their choices of subjects to study. Even very capable surveyors from the local area may not have been able to impart their wisdom and expertise in a classroom environment, but bless 'em for trying!

As for Mr. Harry Hilt's comment that "in previous years the exam was graded on a curve with 70% of examinees made to pass regardless of what they knew": at no time has seventy percent of the applicants ever passed an exam! The highest percentage ever passing was in the low thirty percent range. The exam had been graded on a curve, though. Known as "norm referencing", it allowed for a group of super-qualified candidates taking an especially difficult exam to pass with a numerically lower score in one year, while a group of minimally qualified candidates taking an unusually easy exam in another year were required to obtain a numerically higher score to pass. There are legions of mathematics, statistics, and economics experts who would swear by this method, not at it. It is my understanding that if the 1985 exam passing score was lowered *fifteen* points only a few more candidates would have passed.

The exam is now criterion refer-

enced, with a need to demonstrate competence in a number of fields. All problems on the exam are related to what the candidate who wants to practice surveying is obligated to know by the Land Surveyor's Act, for example:

Section 8726 (a) alignment or elevation; (b) topography, trigonometry, photogrammetry; (c) boundary lines; (d) subdivisions; (e) determination of position, setting of monuments; (f) geodetic or cadastral surveys.

Section 8741 (a) survey fundamentals, math, basic science; (b) rules governing the survey of Public Land as set forth in "Manual of Surveying Instructions".

Section 8761 - prepare maps, plats, reports, descriptions.

Section 8771.5 - coordinates, control schemes.

Contrary to anyone's opinion, there is no group of Land Surveyors in control of the examining process. Professional Land Surveyors' association volunteers solicit questions. The question selection, grading, and cut-off scores are all determined by *independent* committees. More questions are submitted than needed, so only the best are chosen. The submitter does not have to grade the questions after the exam, but must state what is being tested for and what another grader should look for and how to score it. California can be proud of its exam; it tests for regional differences that no multiple-choice answer test could possibly cover and really test for competence.

The grading teams, too, are all volunteer. They are paid minimal wages for their time and talent, but I would hazard a guess that they would do it for nothing! They are usually the best and the brightest in their respective fields and represent a full cross section of Land Surveyors from public and private firms, both large and small. The grading teams have no vested interest in who passes the exam or who doesn't. They have the public interest to protect.

Practicing Land Surveyors do take the exam, and no one is expected to do any better than they do. The educator who said "California now tests for excellence, not competence" sounds to be ignorant of the testing process.

Nobody fails a given questions for knowing the correct solution method

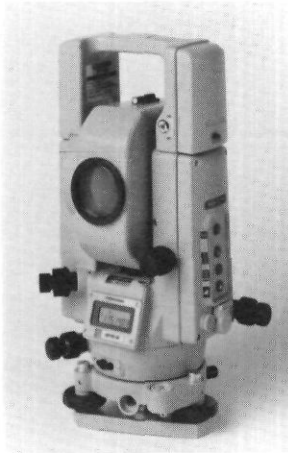
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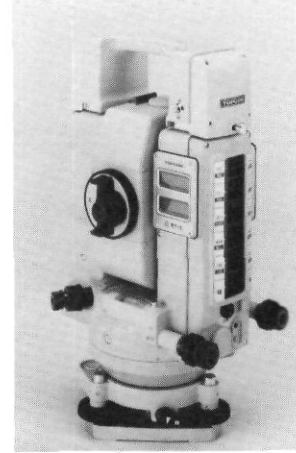


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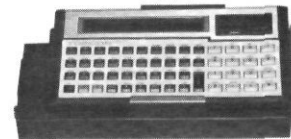
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**Letters** (continued from page 4)  
and making a minor mathematical error. Graders follow-through with incorrect initial computations to their logical conclusion to give credit where credit is due. Even sloppy disorganization is not usually counted against someone if their method can be discerned.

The examinees who pass a question usually pass with a high score; those who fail really fail miserably. It's obvious to a grader which examinees know what they are doing. There is not usually a normal distribution of score for any

given question; some pass, a lot fail, and very few fall in between with partial credit.

Optional problems are offered for those who profess more knowledge in one given subject than another. The candidate chooses the question – not the grader! Some of the more classic answers I have seen for optional problems include: "I know it . . . trust me."; "I don't use this stuff, I don't need to know it"; "Solution impossible!"

Not following instructions and misreading questions is a common cause for failure.

I'm proud to be part of a profession with people in it like Curtis Brown, Ira Alexander, Dave Goodman, and 'Bud' Uzes. It's really scary to realize that I'm supposed to know all that they know. I'm only licensed to *practice* land surveying. That's all examinees are going to be allowed to do. Some will even go on to be the big names in surveying for their time.

Talent is more than *saying* you have it. A demonstrated competence has to be shown on the exam. The public deserves no less.

David L. Lindell, L.S. □

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## Resolution of NSPS Board of Governors On NCEE Model Law Revision

**Whereas**, the Professional Surveyor has long held the primary role in the furnishing of all types of surveying services, including those services sometimes identified as Engineering Surveying, and

**Whereas**, the NCEE task analysis has identified the surveyor as the professional furnishing such services, now therefore be it

**Resolved**, that the NSPS Board of Governors strongly encourages NSPS and ACSM to support the position that NCEE include, within the definition of Engineering Surveying, wording which identifies the Professional Surveyor and Legally qualified Professional Engineers as the only professionals permitted to furnish such services.

– Motion by Roger Cordis, Georgia – Second by Milton Denny, Alabama

Approved: Unanimous

Ratified by NSPS Board of Directors at Anchorage, AK – October 1, 1986 □



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# Board of Directors Meeting Minutes

Minutes of the October 25, 1986

Board of Directors Meeting  
by Susan A. Jensen, L.S., Secretary.

The meeting of the Board of Directors of the California Land Surveyors Association was held at the Grosvenor Airport Inn, South San Francisco, CA.

The minutes of the July 26, 1986 Board of Directors meeting were approved. Neal Campbell, Chairman of the By-Laws Committee, stated that only the suggested amendment addressing "Proxy Voting" was presented by the committee. Other amendments were proposed by Central Office.

## UNFINISHED BUSINESS

The officers gave their respective reports to the Board. The Treasurer, Paul Cuomo, presented the Income and Expenditure Report. The new computer format for the report was discussed and a further breakdown of expenditures was requested for future reports.

A request for a 1987 dues increase was presented by President Siegmund. Hal Davis moved that the Association increase 1987 Corporate dues to \$110 with provisions that 6.7% be designated to the C.L.S.P.A.C., unless specifically directed otherwise by the member, and the primary use of the increase would be utilized for the publication of the L.S. Act, Board Rules and Membership Roster. Second by Paul Cuomo. Lee Hennes demanded a division of the motion, separating the dues increase from the publication of the L.S. Act. After discussion, Claude Tomlinson moved to table the divided motion until after discussion on the proposed Tentative 1987 Budget. Second by Howard Dye. Motion to table passed on a voice vote.

The proposed 1987 Budget was presented with amendments. Susan Jensen moved to approve the amended Budget. Second by Dave DeGroot. The motion passed on a voice vote.

The Treasurer requested a budget adjustment to the 1986 Budget which would increase the amount designated for Central Office from \$22,000 to \$27,000, reflecting additional services being provided. Hal Davis moved approval of the request. Second by Bruce Hall. The motion passed on a voice vote.

The tabled motion regarding the dues increase was returned to the floor. President Siegmund called for discus-

sion on the increase only. The motion to approve was passed with 2 no votes. The question of publications was continued until the presentation of proposed 1987 Association Goals.

**Executive Director's Report:** A written report was attached to the meeting agenda with additional information given concerning increasing computer capabilities at Central Office. The Central Coast Chapter presented a check for \$500 to Central Office for the purchase of a dot matrix printer.

**Goal's Committee Report:** The list of proposed goals was expanded by the Board. The publication of the L.S. Act was discussed as a separate issue. The motion to approve publication was passed with 3 no votes and 1 abstention. Approval of the remaining goals was moved by D.K. Nasland. Second by Dave DeGroot. The motion passed on a voice vote.

**By-Laws Committee:** Neal Campbell presented the proposed amendments to the By-Laws requesting the deletion of "Vice President" and the insertion of "the last 3 of which" in the first paragraph of Section 4.01. Gene Rutledge moved approval of the recommendations for By-Laws changes as amended. Second by Lou Hall. The motion passed on a voice vote.

The Board discussed the recent rescue actions by Michael Pallamary during a residential fire in the San Diego area. Bruce Hall moved that the Association commend Michael for his actions. Second by Paul Cuomo. The motion passed on a voice vote. Hal Davis moved that a resolution be composed commending Michael Pallamary. Second by Gene Rutledge. The motion was passed on a voice vote. The publication committee was directed to print an article about the rescue activity.

**Nominating Committee:** The slate of candidates for 1987 was presented to the Board. Michael McGee nominated Howard Brunner for the office of Treasurer with a second by Roger Ackerman. The amended slate was then approved by a voice vote.

**Conference Committee Report:** Dorothy Calegari, Conference Cochairman gave a verbal progress report on the upcoming Joint CLSA/NALS Conference to be held in Las Vegas, Nevada, March 5-7, 1987. The committee is on schedule and requests for door prizes and student assistance will

be sent to the chapters.

**Education Committee:** Paul Cuomo, Chairman, discussed plans for 1987 Seminars, including programs on A.L.T.A. surveys, Map Processing, Boundary Determination and L.S.I.T. Review.

**Legislative Committee:** Hal Davis moved to approve the legislative recommended program and to direct the committee to proceed, with the exception of a bill deleting Record Data Parcel Maps until further study and communication with the chapters. Also, adding a spot bill for potential legislation on the Record Data issue. Second by Paul Lamoreaux. The motion passed on a voice vote.

Hal Davis moved to authorize the president to execute a contract for governmental advocacy services. Second by Gene Rutledge. The motion passed on a voice vote.

**Membership Committee:** Steve Jacobs, Marin Chapter, was appointed to the committee.

**Publications:** Ron Greenwell, Editor of The California Surveyor, gave a report and requested articles and assistance from the Board. Topics for articles was discussed. Lou Hall moved that the association make a study of how the Monument Preservation Fund is being used in the state and include in the study how Record of Surveys are being filed to ascertain the affects of SB 1837. These studies to be published by C.L.S.A. Second by Michael McGee. The motion passed on a voice vote.

**Professional Practices Committee:** Lou Hall, Chairman, reported on the pending lawsuit initiated by the Cal Trans employees' union, regarding contracting of surveying services. Gene Rutledge moved to direct the committee to prepare a letter to the appropriate person at the State, encouraging Cal Trans to hire survey crews directly in order to insure the contracting of competent people and to utilize the Mini-Brooks bill in negotiations. Second by Steve Jacobs. The motion passed on a voice vote. President Siegmund was directed to send the letter.

**Liaison to the Board of Registration:** Lou Hall moved to direct the Liaison to the State Board of Registration to contact the Executive Officer to see if the Board of Registration which would give priority to complaints brought by Professional Practice Committees.



Second by Susan Jensen. The motion passed on a voice vote.

Gene Ehe and Michael McGee reported on recent Board activities including proposed Board Rule 445, enforcement and the "Engineering/Surveying" issue.

President Siegmund authorized the forming of an Ad Hoc Committee charged with monitoring the "Engineering/Surveying" issue. Gene Rutledge moved that the new committee draft a letter for the President to send to A.C.S.M. stating our concerns about the N.C.E.E. Model Law. Second by Hal Davis. The motion passed on a voice vote.

**Chapter Reports:** The Mother Lode Chapter recommendations for survey education and examination as outlined in a letter attached to the agenda were discussed. Bruce Hall moved that a committee address the issues set forth in the letter. Second by Don Watson. Paul Cuomo moved to amend the motion, charging the Education Committee with the task of developing a Continuing Education Program and charging the L.S. Exam Development Committee with reviewing the specific areas to be covered on the L.S. Exam.

Second by Dave DeGroot. The amendment passed on a voice vote. The amended main motion was then passed on a voice vote.

Gene Rutledge moved that the Association plan a 2 day Board of Directors meeting in January, the first day being an orientation and instructional class on Director's responsibilities. Second by Paul Cuomo. The motion passed on a voice vote.

#### NEW BUSINESS

Paul Cuomo moved adoption of Resolution 86-13 which divides the Los Angeles/Ventura Chapter into two chapters, the Los Angeles Chapter and the Channel Islands Chapter. Second by Steve Jacobs. The motion passed on a voice vote.

Hal Davis moved adoption of Resolution 86-14 which grants Life Membership to Leroy Martin of the East Bay Chapter. Second by Lee Hennes. The motion passed on a voice vote.

Dave DeGroot moved adoption of Resolution 86-15 which establishes Memorial Scholarships in the names of James E. Adams and A.E. Griffin. Second Steve Jacobs. The motion passed on a voice vote. Meeting adjourned. □

## Professional Land Surveyors of Ohio vs. Chicago Title Insurance Company Court Suit Settled

This is to summarize the successes of the above captioned litigation.

1. The litigation established the right of professional surveyors and their professional associations to maintain actions for injunction against unlicensed professional practice.

2. The litigation established that not all of the activities listed in the statutory definition of surveying need be performed by an unlicensed practitioner to establish that such unlicensed practice is illegal.

3. Most importantly, the original goal of the litigation has been achieved: title insurance companies are no longer practicing surveying in northeast Ohio. As a result of the recent decree of injunction ordered by the Court, Chicago Title Insurance Company can no longer provide measurements, by verbal or graphic description, of encroachments, apparent easements or improvements in relation to any real property boundary unless such measurements or descriptions are provided by a survey undertaken by an independent, registered surveyor, and all such surveys must be current.

Ohio Surveying News □

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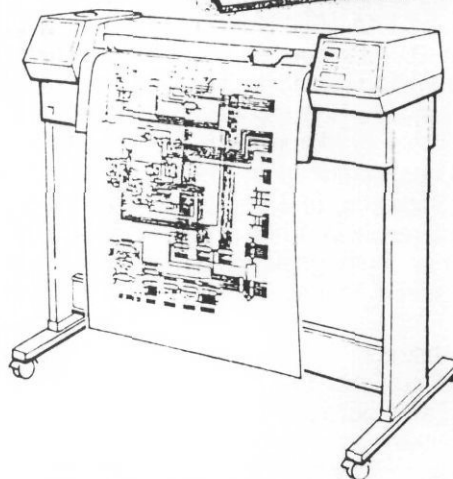
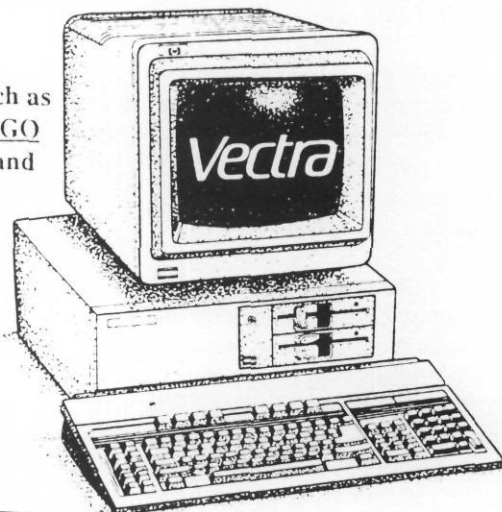
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# City of Los Angeles Automated Mapping Layering System

Last fall the Los Angeles/Ventura Chapter presented a Scholarship program for the benefit of survey students. The purpose of the program was to recognize and encourage students pursuing an undergraduate or graduate degree in surveying or related program who research and write on topics of interest to the surveying profession in California. The following article by Tracie L. Mesloh, the recipient of the second scholarship, is presented in this issue. The article by Mark Lewis the other second winner will be presented in the next issue.  
by Tracie L. Mesloh

## Biographical Sketch

The author is currently completing a Bachelor of Science degree in the surveying engineering program at California State University, Fresno. She is a member of the Student Surveying and Photogrammetry Association at C.S.U., Fresno, as well as a student member of C.L.S.A. and A.C.S.M. Miss Mesloh was involved in B.L.M.'s cooperative education program and has worked in Alaska for 3½ seasons. She received her L.S.I.T. certificate in March 1985, and has also been chairman of the C.S.U., Fresno, Surveying and Photogrammetry Conference in 1985 and 1986. One of her main goals is to become a registered licensed Land Surveyor.

## Abstract

This paper documents the implementation, use, and purpose of Los Angeles's automated mapping layering system. The basis for this system was accomplished in four phases. The first phase was the first order geodetic triangulation network covering all of Los Angeles city and part of Los Angeles county. The second phase was designing the network into second and third order triangulation networks. The third phase was surveying and establishing the centerline of all city streets. The final phase was combining the first three phases and tying the centerline intersections of all the city streets by field methods and/or office calculations. This set up the geodetic reference framework for the cadastral parcels (maps). These cadastral parcels became the contingency for all other layers in the mapping system. The determination of

these other layers depended upon the wants and needs of the other departments involved. All of the layers are in the mainframe computer system, and can be retrieved by simple access codes. The finished maps are available for use by any of the city departments as well as by the public.

## Introduction

Los Angeles city's cadastral overlay system was the inspiration of Harold Seidenstucker in the mid-1960's. The basis of this cadastral system is a geodetic framework consisting of Zone 7 state plane coordinates located at every major intersection in Los Angeles city. At the beginning of the initialization of the system, there was a major political confrontation as to who was to be in charge . . . the Division of Surveys or the Division of Mapping. The end result was that it became the Division of Mapping's responsibility. However, before Mapping could take over, the Survey Division was first given the task to initiate ground surveys into district maps (cadastral parcels). These maps were automated by computer at one-hundred feet scales to meet with the National Map Accuracy Standards of 1/30 inch accuracy. These district maps were then given to the Mapping Division. The new cadastral parcels were tied to all existing controls (including centerline) based upon Zone 7 state plane coordinates. From these maps, overlays were then superimposed.

The overlays were made by different bureaus, depending upon what was needed at the time. One example is the Bureau of Engineering - Sewer Division, which used the cadastral maps as a "base map" for existing sewer manholes and storm drains. The Department of Water and Power made overlays of existing fire hydrants to fit Los Angeles city's cadastral maps. Because of the many departments and divisions involved, the funding for all the layers came out of their respective budgets. In order to get this funding, this system is not considered as "mapping," but as an index. Even though the index is in control of the Division of Mapping, the surveyed Zone 7 state plane coordinates are the references used to access the maps from the mainframe computer system. This automated mapping overlay index system is an excellent example of a working multi-purpose cadastral.

## Geodetic Framework

In the late 1920's and early 1930's, Los Angeles city and county geodetic control network was begun. This consisted of 38 U.S. coast and geological survey first order triangulation stations. It was a cooperative survey with U.S.C.G.S. using classic triangulation to get positions on the control stations. This network set up the basic control for both Los Angeles city and Los Angeles county.

The stations were scattered throughout all of Los Angeles city and the southern half of Los Angeles county. Mount Wilson is the highest peak, with three to four stations just north of there, while the rest were placed as far south as Orange County. The surveyed accuracy was first order control with the precision being 1:25000. There were two baselines in control network. Both were measured by invar tapes by Los Angeles city crews and met all the standards and specifications for first order at that time.

In 1978, the control network was updated. Because of the non visibility factor, which resulted from skyscrapers and other tall buildings impeding the line of sight between control stations, new stations were established. Like the old network, there was still 38 N.G.S. (U.S.C.G.S.) control stations. There were also a few stations of the original network left, such as Mount Wilson. This



Leonardo says we should adjust our plumb bob on the next job.



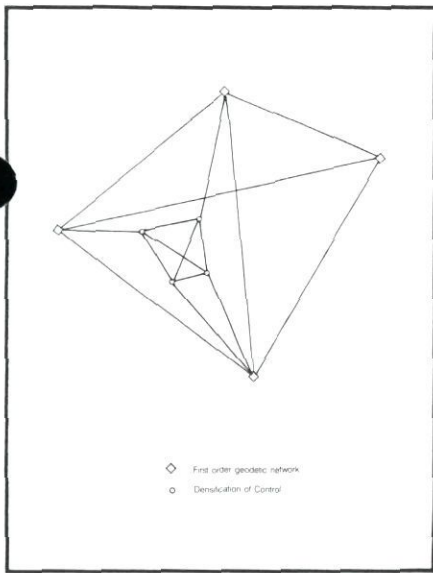


Figure 1: Control Network

new control network was surveyed to meet NGS's due book requirements. The adjustment done on this network was redundant – measuring all distances and all angles. Because of the combined triangulation and trilateration methods, a least mean square adjustment was done. This new network is also part of the new 1983 geodetic datum for the United States. This constitutes the first phase of the geodetic reference framework.

**Densification of Control**

The second phase of the mapping system's geodetic reference framework was the densification of control. This was accomplished by placing "second" and "third" order control in between the 38 first order triangulation control stations (see Figure 1). These new stations were all tied into the main control network and closed at 1:25000 precision.

**Centerline Data**

The establishment of street centerlines was phase 3. Because many streets were as built, centerlines had to be calculated from surveyed offset lines. The procedure used was averaging the center of the offsets from the existing lot lines to generate calculated positions (see Figure 2).

Once these centerlines were established, intersections could then be calculated in the office and monuments placed in those positions. The final phase of the horizontal control could now be started.

**Final Phase**

The last process of the geodetic framework ties the centerline data to the control network. This established the data base maps which are the foundation for the automated map index. The ties were accomplished by office calcu-

lations and/or field survey methods. First order traversing from the closest control station through the computed centerline intersections of the streets, and closing out on another station constituted the basic procedure. If field work was not possible, then office personnel was used to traverse on paper from previous survey information to get the computed positions of the street intersections (see Figure 3). All adjusted computations were established by Zone 7 California state plane coordinates.

California state plane coordinates were used on all control stations and street intersections. This was the best method to enable transition from geodetic to a plane grid. One advantage to using state plane coordinates was the accuracy shown at each position by how far the coordinate was carried out past the decimal. This was because

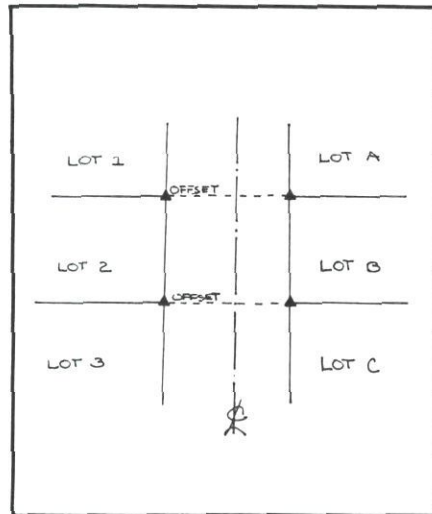


Figure 2: Generating Street Centerlines

some measurements were carried out to .01 foot while others, due to adverse terrain, could only be to the nearest tenth of a foot and to the nearest foot. Since the maps are for public as well as agency use, the city of Los Angeles stamps a disclaimer notice on the map:

NOTE: *The coordinate values on this map are for mapping purposes only. Coordinates, distances, and bearings should be verified by field measurements for any other use.*

This disclaimer notice protects the city in case of fraudulent survey maps made from paper surveys.

**Cadastral Parcels**

The combination of the geodetic triangulation control and centerline intersections of streets make up the data base maps: cadastral parcels. This is the main layer of the index. These parcels are referenced into the com-

puter in 3000 by 4000 foot blocks. This best represents the Lambert conformal on a grid. The access code of the northings and eastings of the state plane coordinates is used to call up these maps on the computer. Los Angeles city has a simple, yet thorough, system to get these codes. They use the Thomas Street Guide for all of the city. Clear plastic sheets are permanently placed upon each map page of the guide. On these streets, blocks are depicted to show where the even northings and eastings occur. From this, it's just a simple procedure to locate the area wanted, note the coordinates, and call down to the mainframe computer to get the map you want – at any scale. The process of creating these cadastral parcel map layers has taken about ten years. There is still work that is being done on it, but since most is completed, many benefits and uses are being taken advantage of. All other departments have access to the cadastral parcels, and use them as controlling base maps for their various layers (see Appendix A and B).

**Computerization**

The mainframe computer system is made up of four 300 megabyte machines. The terminals are single display screens with a keyboard, cursor and menu. The data processing system is made up of a disk drive, magnetic tape unit, file processor, central processor, and data concentrator. This system can be used with a pen plotter because all data is input in vector mode. However, because of time consideration, a banded vector-to-raster converter is used in conjunction with a dot matrix printer. The time saved is immense. For

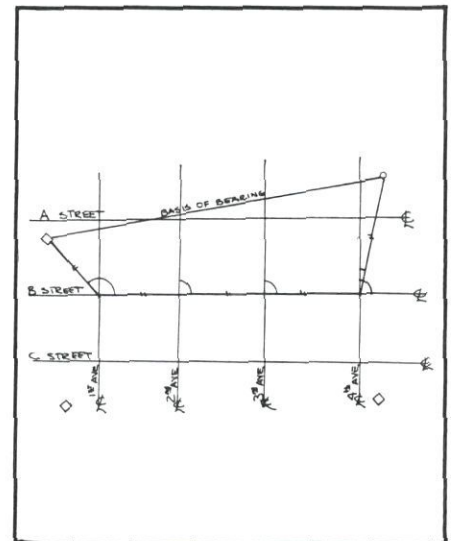


Figure 3: Tracing Centerline to Geodetic Control

(continued on page 14)

**Mapping** (continued from page 13)  
instance, a map made at a scale of 1:400 would take about six hours to draw on a pen plotter, but with the rasterizing dot matrix printer, the output time is only five minutes.

The cadastral parcels are programmed into the computer in vector mode. This is because vector mode output has a higher accuracy than raster mode or digitization since the cadastral parcels are only programmed in at 1:100 foot scale. This is the only scale in which any output map can be made to fit the specifications of the National Map Accuracy Standards. The parcels are also fit in as 3000 foot by 4000 foot blocks. This system best fits the Lambert grid, while helps reducing the "rubber sheeting" down to small blocks. Because the other scales do not fit the N.M.A.S., they are used for various departments such as police, fire department, and administrative planning. Planning maps have to have a lot more text information, so this way, the lines can be adjusted around the wording to make them easily understood as well as aesthetically pleasing to the eye.

#### Layers

The cadastral parcel layer is considered to be the grid control for other layers. Besides control, other information is established on this layer. These include map borders, title blocks, north

arrows, 1000' grid indicator lines, bar scales, and formatted text. The boundary lines consist of all city existing boundaries, mean high tide lines, card adjoining counties and cities. The text for this layer is the true city boundary line of Los Angeles, established May 17, 1957, by the city Ordinance 95283, Pacific Ocean, and a box for mean high tide lines. All spatial relationships are with respect to these cadastral parcels.

The next layer is the right-of-way sidelines. These are made up of major and secondary highways, flood control, railroad R/W, major transmission lines, and canals. The freeways are broken down to traveled roadway and pedestrian facilities, while local streets are broken down into alleys and walks. The text for this layer includes the private street names and freeway names.

In the tract line layer, all tract lines are shown except within the freeway right-of-way. This layer consists of tracts, parcel maps, sections and lots of sections, ranchos, district court cases and superior court cases, and freeway R/W sidelines. The text includes small tract title, map references, and details. Another layer are the Los Angeles city easement lines. See Appendix C for the listing. This is a very brief description of some of the most commonly used main layers. As shown from Appendix A, there are 33 layers total at this date.

Another feature the mapping index has is the luptans. Each lot has the deed number and next to that the parcel number in parenthesis. The luptans are the access to various text such as chain of title, description, ownership, tax assessment, and size. Research is still going on as to how to interrelate all this information through the computer.

#### Applications

Los Angeles has a good start on their automated mapping system. Because of this, they've been able to use it to their advantage. Some of the applications have been noted before, such as road maps for the police and fire department. Administrative planning also uses them for their work. Street opening and widening division uses this system extensively as well as other cities and counties. But most important to the concerns of the people who initiate these maps, the surveyors can make use of them for their own applications. The accuracy and reliability makes it so that private surveyors as well as city government surveyors can use these to an advantage.

One instance in this case would be measuring ground movement. This can be used for monitoring land slides and seismic or tectonic earth movement. For example, in the Paseo Miramar area near Sunset Drive and Palisades Drive subseismic activity was known to exist. It seems that a survey crew had to close their leveling loop on the same day as they started in order to meet the required closure. To see exactly where the movement existed, Metrix Corporation was contracted to fly the area. Metrix then drew up a stereo plotted map of the land in question. The control used was the same control that was used to make the cadastral parcel. The cadastral layer and the stereo map layer were then superimposed upon one another to make a third map. With this map, it was easy to see where the major land movement was taking place, and where there seemed to be virtually no land movement. Since this area is a highly densified area of some wealth, the geological department could help determine where, if any, immediate dangers would be. This is just one example of the many applications Los Angeles uses their automated mapping system.

#### Conclusion

Who knew that twenty years ago Harold Seidenstucker's idea would grow with such abundance. The progress that has been made with Los

(continued on page 16)

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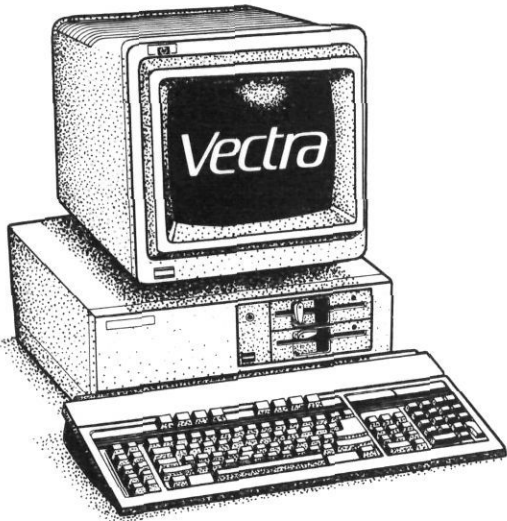
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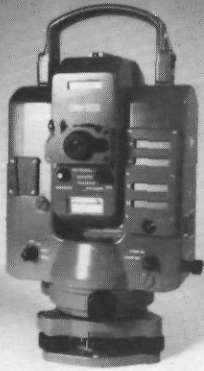
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## Mapping (continued from page 14)

Angeles's automated mapping layering system has been astonishing. From Los Angeles city's standards that were established in 1917 for geodetic control, to the densification of the control, and to the centerline intersection ties, good and accurate data base maps were obtained. These formed the main layers of the automated mapping system known as the cadastral parcels. These cadastral parcels meet with the National Map Accuracy Standards of 1/30 inch for the 1:100 foot scale.

Other bureaus and departments use these to spatially relate their own information for their own layers that they need. This was done by first gathering the information relating to the parcel's boundaries. Then, an analysis of this information was done and all existing movements found or set were tied to Los Angeles's Zone 7 state plane coordinate system. A mainframe computer was then used for storage and retrieval for all input survey data, and using vector mode with a rasterizing dot matrix printer, maps could then be reproduced along with any other overlay output. Each parcel uses the northing and easting code as an identifying number that can be used to call up the pertinent data from the computer. This automated layer mapping system is a good example of how Los Angeles can make excellent use of a multi-purpose cadastre.

### Acknowledgments

This is the first time the Los Angeles automated mapping layering system has been put down in documentation form. This could not have been done without the help and cooperation of various individuals that work for the city of Los Angeles. There are two people especially who have been more than invaluable in their time and services, and I would like to extend to them my gratifications with this acknowledgment:

#### Robert Packard;

City Surveyor, Bureau of Engineering  
Department of Public Works  
Los Angeles, CA

#### Betty Mason;

Cartographic Section, Bureau  
of Engineering  
Department of Public Works  
Los Angeles, CA

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## Appendix "A" City of Los Angeles Automated Mapping Layering System

### LAYER

0. CADASTRAL FORMAT
1. BOUNDARY LINES (EXISTING)
2. BOUNDARY TEXT
3. CENTERLINE
4. MAP CONTROL
5. GRID CORNERS
6. R/W SIDELINES
7. R/W TEXT
8. TRACT LINES, SECTION LINES, FWY R/W LINES
9. MAP REF., SMALL TRACT TITLE & SHT OR SHTS 10 HGT OR LESS
10. LOT LINES
11. LOT NUMBERS
12. LOT CUTS
13. LOT CUT DIMENSIONS
14. LOT DIMENSIONS
15. PRIVATE STREET LINES
16. ORIGINAL LOT LINES IN STREETS
17. DEEDS (STREET DEDICATIONS)
18. ALL GOVERNMENTAL EASEMENT LINES
19. L.A. CITY EASEMENT LINES
20. BOXES FOR TEXT
21. ALL GOVERNMENTAL LINES (FEE)
22. U.S. GOVERNMENT TEXT
23. SMALL R/W TEXT
24. STATE TEXT
25. TRACT TITLES
26. COUNTY TEXT
27. OTHER CITIES TEXT
28. CITY TEXT
29. R/W WIDTHS
30. FORMER CITY BOUNDARY LINES
31. FORMER CITY BOUNDARY LINES TEXT
32. EASEMENT TEXT
33. DASHED TRACT LINES

### Appendix "B"

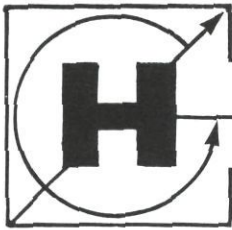
## City of Los Angeles Automated Mapping Layering System

### DEPARTMENTS

DEPARTMENT OF AIRPORTS  
DEPARTMENT OF RECREATION AND PARKS  
DEPARTMENT OF WATER AND POWER  
DEPARTMENT OF SANITATION  
L.A. CITY AND COUNTY  
FIRE DEPARTMENT  
HARBOR DEPARTMENT  
POLICE DEPARTMENT  
COUNTY ASSESSOR

### Appendix "C" Easements

	ABBREVIATIONS
ABUTMENT EASEMENT	ABUTMT EA
AIR EASEMENT	AIR EA
AVIGATION EASEMENT	AVIG EA
BRIDGE EASEMENT	BRDG EA
BULKHEAD EASEMENT	BULKHD EA
COMMUNICATIONS EASEMENT	COM EA
CONSTRUCTION EASEMENT	CONST EA
DRAINAGE EASEMENT	DR EA
EQUESTRIAN EASEMENT	EQ EA
FIRE ALARM EASEMENT	FIRE ALARM EA
FIRE HYDRANT EASEMENT	FIRE HYD EA
FOOTING EASEMENT	FT EA
FOOTPATH EASEMENT	FUT ALLEY
INGRESS AND EGRESS EASEMENT	ING & EG EA
NOISE EASEMENT	NOISE EA
PEDESTRIAN EASEMENT	PED EA
PRIVATE STREET	PVT ST
PUBLIC UTILITY EASEMENT	P U E
RETAINING WALL EASEMENT	RET WALL EA
SANITARY SEWER EASEMENT	S S E



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# NCEE to Review "Engineering Surveys" Definition In Model Registration Law

FALLS CHURCH, VA – The American Congress on Surveying and Mapping (ACSM) has learned the National Council of Engineering Examiners (NCEE) has instructed a committee to review the new definition of "engineering surveys" which NCEE adopted in August as part of its Model Law for registration of professional engineers.

NCEE President J. Harry Parker, PE, PS, has asked his Council's Land Surveying Committee "to make a study of the desirability of clarification of the engineering definition and a review of the current definition of the practice of land surveying to ensure that these definitions properly protect the public in matters of competence without restricting members of either profession from performing tasks normally associated with their practice"

The specific charge to the NCEE Committee on Land Surveying is as follows:

"Study the need to clarify the relationship of boundary determination and qualifications needed to perform engineering surveys as defined in the Engineer Model Laws and the need for more specific language in the Survey Model Law definition to reflect current practice by licensed surveyors."

The review of NCEE's past action on defining "engineering surveys" came after Mr. Parker met with ACSM leaders at the fall convention in Anchorage, Alaska. At that meeting, the Board of Governors of the National Society of Professional Surveyors (NSPS), a member organization of ACSM, adopted a resolution urging NCEE to include "within the definition of engineering surveying, wording which identifies the professional surveyor and legally qualified professional engineers as the only professionals permitted to furnish such services."

The definition, reads as follows:

"Engineering surveys include all survey activities required to support the sound conception, planning, design, construction, maintenance, and operation of engineered projects, but exclude the surveying of real property for the establishment of land boundaries, rights-of-way, easements, and the dependent or independent surveys or resurveys of the public land survey system."

In a related issue, ACSM Executive

Director Richard F. Dorman, CAE, has asked his NCEE Counterpart to "hold in abeyance" the definition approved in August, pending the completion of the study.

"Surveyors in all 50 states should know this issue is far from over. If there should be an effort in any state to gain approval of the engineering surveys definition by a Board of Registration or State Legislature, surveyors should forcefully point out that the matter is under review by NCEE," according to Dorman.

According to a 1984 study conducted by NCEE, more than 60 percent of licensed surveyors across the Nation perform surveys that are not property/boundary related. If adopted by the states, the definition approved by NCEE in August would permit engineers to perform these non-boundary surveys.

"Surveyors throughout American can be assured ACSM is working with NCEE to remedy this situation. We are grateful that NCEE President Parker has been so cooperative and willing to bring about an equitable solution that will serve the best interests of both the public and the professions," Dorman added.

NCEE is composed of representatives of state boards of registration for engineers and surveyors. Its model registration law is advisory and is used by state legislatures or registration boards to amend existing registration laws.

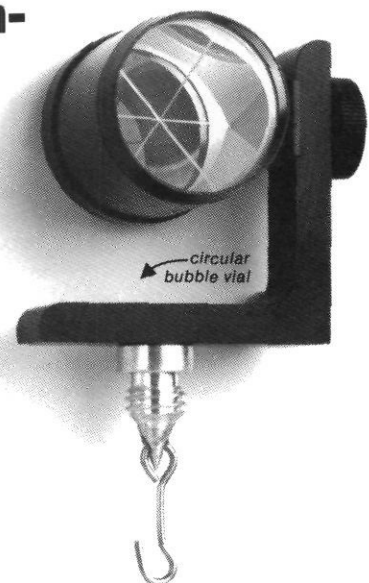
The American Congress on Surveying and Mapping is a national professional society with more than 11,000 individual members in surveying, cartography and geodesy from private practice, government service and academic instruction. □

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# Readers Response Poll on Engineering Surveys

Currently, statewide and nationally, there is a move to define the term "Engineering Surveys". This term has been developed as a description for surveying disciplines that would be allowed under engineering registrations.

The National Council of Engineering Examiners (NCEE) has adopted the following definition of "Engineering Surveys" for its use in the NCEE Model Law:

*Engineering surveys include all survey activities required to support the sound conception, planning, design, construction, maintenance, and operation of engineered projects, but exclude*

*the surveying of real property for the establishment of land boundaries, right of ways, easements, and the dependent or independent surveys or resurveys of the public land survey system.*

Within the State of California, The Board of Registration is required to test all applicants for registration as a Civil Engineer on those aspects of surveying that they are allowed to practice within. The Board uses "Engineering Surveying" to describe those surveying practices.

C.L.S.A. has formed a committee to first determine how the term is being used and how it may affect surveying

and second, what attitude and action the State should take toward "Engineering Surveys".

This publication is attempted to determine what its readers know of Engineering Surveying and how they feel about its use. The results of the questionnaire will be published in a future issue of **The California Surveyor** as well as being submitted to the CLSA Committee for their review. If you are interested in being a member of the "Engineering/Surveying Committee or have additional information you would like to pass on to the Committee, please contact the Central Office of C.L.S.A.

## QUESTIONNAIRE

### Background

Which Organizations do you belong to and are active within.

	Active Member	Member
California Land Surveyors Assoc.	<input type="checkbox"/>	<input type="checkbox"/>
C.L.S.A. Local Chapter	<input type="checkbox"/>	<input type="checkbox"/>
American Congress of Surveying & Mapping	<input type="checkbox"/>	<input type="checkbox"/>
CA Council of Civil Engineers & Land Surveyors	<input type="checkbox"/>	<input type="checkbox"/>
American Society of Civil Engineers	<input type="checkbox"/>	<input type="checkbox"/>
Other Professional Organization	<input type="checkbox"/>	<input type="checkbox"/>
Name _____		

	Yes	No
Are you a Licensed Surveyor in California?	<input type="checkbox"/>	<input type="checkbox"/>
Are you a Registered Civil Engineer in California?	<input type="checkbox"/>	<input type="checkbox"/>
If yes, after 1982?	<input type="checkbox"/>	<input type="checkbox"/>
Are you a Licensed Surveyor in another State?	<input type="checkbox"/>	<input type="checkbox"/>
Are you a Registered Engineer in another State?	<input type="checkbox"/>	<input type="checkbox"/>

### In regards to the NCEE Model Law Definition:

	Yes	No	No Opin.
Do you agree with the definition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you agree with the concept?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you feel the need for NCEE to define "Engineering Surveys"?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Should NCEE establish a Model law for land surveying?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Your Opinion on "Engineering Surveys"

	Yes	No
Have you heard of the term "Engineering Surveys"?	<input type="checkbox"/>	<input type="checkbox"/>
If Yes, what was it describing? _____		
Do you feel the term "Engineering Surveys" should be used in State Law?	<input type="checkbox"/>	<input type="checkbox"/>

Do you feel that construction surveying should be a distinct discipline within surveying?	<input type="checkbox"/>	<input type="checkbox"/>
Do you feel construction surveying should be a distinct discipline in engineering?	<input type="checkbox"/>	<input type="checkbox"/>
Do you feel that boundary surveying should be a distinct discipline within surveying?	<input type="checkbox"/>	<input type="checkbox"/>

### What types of surveying have you been involved in?

	Have been involved with	Competent in
Construction Surveying	<input type="checkbox"/>	<input type="checkbox"/>
As-Built Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Topographic Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Cartography	<input type="checkbox"/>	<input type="checkbox"/>
Hydrographic Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Photogrammetric Control	<input type="checkbox"/>	<input type="checkbox"/>
Photogrammetric and/or Remote Sensing	<input type="checkbox"/>	<input type="checkbox"/>
Boundary Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Cadastral (Public Land) Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Subdivision Mapping and Design	<input type="checkbox"/>	<input type="checkbox"/>
Right of Way Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Geodetic or Control Surveys	<input type="checkbox"/>	<input type="checkbox"/>

### Which of the following should C.E.'s be tested on and therefore allowed to practice?

	Yes	No
Construction Surveying	<input type="checkbox"/>	<input type="checkbox"/>
As-Built Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Topographic Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Cartography	<input type="checkbox"/>	<input type="checkbox"/>
Hydrographic Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Environmental Surveys	<input type="checkbox"/>	<input type="checkbox"/>
Photogrammetric Control	<input type="checkbox"/>	<input type="checkbox"/>
Photogrammetric and/or Remote Sensing	<input type="checkbox"/>	<input type="checkbox"/>

Please use an additional sheet for comments.

Return to: CLSA Central Office, P.O. Box 9098, Santa Rosa, CA 95405



# Keynote Address At The 1986 ASPRS-ACSM Fall Convention

by Gerald Raymond,  
*Surveyor General of Canada*

First, I would like to thank the people responsible for this convention for having invited me as keynote speaker this morning. I consider this invitation an honour and it is with great pleasure that I address the topic of new frontiers for our profession.

The word frontier raises different ideas and emotions in people. To some a frontier is physical. It refers to the opening up of new land, such as the West, the North or Alaska. It also means outer space, which is often called the last frontier, or the oceans. To other people a frontier is more subjective. It is a state of mind related to the feeling of freedom.

In the June 16 issue of Time magazine, an article entitled "Freedom First" suggests that the real frontiers are freedom and the future; in other words the freedom to do what we want to do to ensure our future. To illustrate the relationship between the ideas of frontier and freedom, the article gives a particularly appropriate example since it concerns Wasilla, a town in Alaska located about 45 miles north of here.

According to this article, Wasilla has been trying to get along without the usual restraints that limit freedom in the name of order in most North American cities. No zoning, no police, no planning, no taxes. As the former mayor of Wasilla told a Wall Street Journal reporter last February: "people move here and buy their one acre. They build a house. They put in a septic tank and a water well. They become a little kingdom unto themselves. They've got a .44 magnum, and if anybody messes with them, they become a police department too".

The freedom to control our future is a powerful concept: It is the lure behind the desire to explore frontiers. But today there are few frontiers to push back and less and less unexplored land to discover. Even space and the oceans are only open to exploration by a few people. So where are the frontiers for people to push back today? What are the new frontiers? The new frontiers are society's restrictions on individual freedom and control of the future. They are the State's intervention in almost all aspects of human activities. In reaction

to this situation and its burden on government revenues, we are now entering a period of de-regulation and government downsizing. In view of this changing relationship between society and the State, what are the new frontiers for professions? Professions will be provided with the opportunity to assume more responsibility in their respective fields of expertise. For our profession the new frontiers are in the field of land information. Our responsibility is to ensure closer cooperation amongst surveying and mapping disciplines to provide systems and standards which will make optimum use of space age technology to meet the increased demand for information. This is the topic I would like to discuss with you this morning.

Today de-regulation and government downsizing has become a reality in many countries. This trend is particularly strong in the United States and the United Kingdom and is receiving renewed attention in Canada under the present administration. As stated in an article by John Konrad in Current Issues, Price Waterhouse, July 1986, "governments are moving towards greater reliance on the market to achieve their policy objectives through initiatives to deregulate industries and privatize state enterprises. Governments should consider devolution of services to professional groups in the private sector, to nonprofit agencies and to local government as a means of reengaging community enterprises. Such transfer is likely to foster more innovative and flexible solutions to social problems, to reduce dependence on government and to result in reduced government expenditures".

In some areas useless rules are being abolished and in others more functional regulations are being adopted. At the same time functions exercised by the public sector are being returned to the private sector in order to promote more real competition in fields which until now were reserved to the public sector. After continued growth during the last few decades, public administrations have now started downsizing.

As a result of this new trend, there will be less management by the State and more freedom for Society. This new

relationship will have a great effect on organized groups such as professional associations. It could provide new frontiers for professions.

As stated in a recent report on the operations of the Government of Canada:

"better decision-making by government might result from having a better organized, more active and professional contribution to government by the private sector. Industry and professional associations are often too narrowly focused or poorly organized to contribute to public policy making. If they had more responsibility for providing information, self-regulation, and public policy advice, they could strengthen their organizations and ultimately contribute to better decision-making by government."

But the ideas of new frontiers, more freedom, and control of the future, implying the obligation to assume more responsibility. Professional associations which, in recent years, have been under increasing public scrutiny will have to continue demonstrating that they put the protection of the public above self-interest.

The idea of new frontiers is not new to our profession. Wherever there were new frontiers to explore; members of our profession were there to map the new territory and to demarcate the land for orderly settlement. The surveyor accurately established the details and location of the physical landscape, the cartographer converted that information into map form and the geographer studied the pattern and form of the cultural landscape.

The ideas of freedom and control of the future are also part of our tradition. By ensuring the integrity of boundaries, and the definition of the extent of land, surveyors contribute to the protection of property rights which are a fundamental feature of democracy. This concern for protecting private property was expressed by Plato in the following quote:

"Let no one touch the monuments which separate the field of one citizen from that of his neighbour, or the field of a foreigner, if the lands are situated on the boundaries of a country; such an act would be moving something which should not be disturbed; and everyone should have the will to move



the biggest stones rather than the monuments or small stones which mark the boundaries of friendship or hostility".

People involved in various surveying and mapping activities also contribute to the future by providing the information about land which decision makers use to plan for the orderly development of land and the rational management of natural resources.

The success which our profession has had in dealing with frontiers in the past was made possible because our profession works within surveying and mapping systems and in compliance with standards of practice. The systems include control networks, cadastral survey frameworks, mapping, land registration and land information systems. Within these systems, there are standards to specify how surveys and maps must be made to be acceptable for public records and public use. These are the necessary requirements to ensure the integrity of the information which we provide to the public.

The establishment and the maintenance of survey systems and standards have traditionally been a governmental responsibility. But as government de-regulation and downsizing take place, some of these functions are being delegated to professional associations.

For example, in the province of Quebec, although the government remains responsible for the survey system, the land surveyors' association is responsible for the standards of surveys of private lands. The government with the advice of the association enacts the legislation and regulations but it is the responsibility of the land surveyors' association to ensure that they are adhered to. To this end the Quebec Land Surveyors' Association has a full-time officer who is responsible for hearing and investigating complaints from the public and from surveyors. Through the investigation he will either solve the complaint or refer it to the disciplinary committee. The Quebec surveyors' association also has a professional inspection program to ensure the continuing high quality of the surveyor's work and office procedures.

Similarly, the Ontario Land Surveyors' Association has recently accepted the responsibility for the examination of all surveys prepared for land registration. To take over this function the Ontario government provided a one-time grant of \$100,000 to the association. The association hired two land surveyors and two clerical staff to operate a Survey Review Department. For ongoing operational funds the

association has a levy of fifteen dollars per plan.

For another example we can look at Switzerland where some traditional functions of North American governments are delegated directly to the private sector. Private surveyors are selected and granted a three year contract to look after the maintenance and updating of the official cadastre. This contract is automatically renewed unless the work is unsatisfactory. This provides for continuity of expertise in dealing with the records.

Since their origin, and because of their economic and social implications, surveying and mapping activities have always been controlled on behalf of the public. At first this control was exercised through religion. Eventually it came under the authority of the State. Now the control is being transferred to our professional associations. For effective de-regulation of government responsibilities a very good relationship between public sector professions and private sector professionals is a necessity. Also proper de-regulation must be accompanied by appropriate regulation. In other words, only with good regulations is it possible to de-regulate.

This new organization of functions between the public sector and the pri-

vate sector constitutes a major challenge for the surveying and mapping community. Our profession has been traditionally made up of two distinct groups: public sector surveyors and those engaged in private practice. In Canada, for example, for many years, there was an equal proportion of these two groups. In recent years, however, the private sector surveyors and mappers, have formed more than 60 percent of the profession. Until recently private surveyors and surveyor associations have relied on their public sector colleagues to ensure that proper survey systems and standards were established and maintained. The plan examination processes of some government survey agencies illustrate how private surveyors have relied on their public sector colleagues for quality control. As one private surveyor once said, why should I bother to examine my survey plans when the government does it for me for free. Also private sector surveyors have often viewed the survey systems and standards more as constraints to their practice than a safeguard for the integrity of the information and the protection of the public. Similarly, surveyors associations have not been overly concerned with discussing

*(continued on page 22)*

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**Keynote** (continued from page 21)  
survey systems and standards. As I have mentioned earlier, these concepts are changing with the private sector and surveyor associations assuming more of the traditional governmental responsibilities.

The new organization of functions between public sector and private sector surveyors has introduced a major cultural change in the surveying and mapping community. Surveyors and mappers associations are getting more involved in questions concerning survey systems and standards. They are also realizing that ensuring the protection of the public is not necessarily detrimental to their self-interest. On the contrary, the surveying and mapping community is conscious that by protecting the public interest it also ensures the future of the profession.

Society's continuing increase in demands for information, and the availability of new technology to meet these demands, also offer new frontiers to our profession. During the last decade, our profession has made significant contributions in applying new technology to the surveying and mapping of our respective countries. Many jurisdictions are now equipped with reliable control

survey networks and mapping products. In some cases, this information is even available in numerical form through electronic communication. However, the effective management of this information requires that traditional systems and standards be modernized to enable the exchange of information.

In addition, the integration of cadastral survey and land registration records within land information systems constitutes a major challenge for our profession. Despite the progress made in other surveying and mapping fields, little progress has been achieved in the modernization of the property rights systems. The progress in acquiring and integrating surveying and mapping information was primarily due to the "closed shop" nature of its operating environment, while the lack of progress in modernizing and integrating the property rights systems was primarily due to the varied nature of the community involved in its operating environment. The challenge facing the profession in this area is to effectively integrate property rights information with surveying and mapping information within a comprehensive land information system.

The coordination of the activities of various surveying and mapping disci-

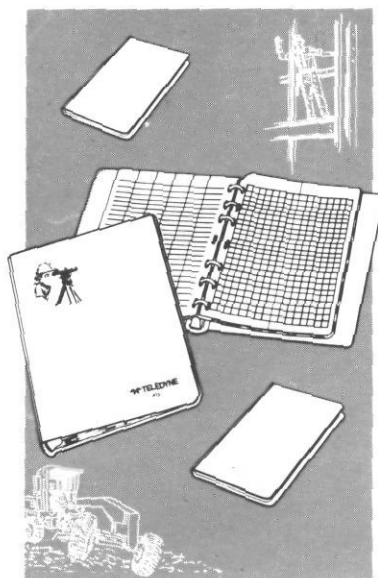
plines is a major concern which should be addressed by the profession. As stated in a paper by Brian Humphries presented at the Fall 1984 FIG symposium held in Edmonton, Canada: "it is ironical that foreign governments can quickly obtain a picture from a satellite of an area of land but the local administrators cannot tell you who owns it". Without close cooperation amongst these disciplines it will be difficult for our profession to play a leadership role in land information systems. The profession also needs to increase its concerns about the systems and standards required for land information systems. In this regard our profession has a fundamental role to play as members of organizations dedicated to the development of land information systems. As you probably know the Institute for Land Information (ILI) has recently been reorganized. It now includes a membership arm called the Land Information Assembly. This assembly is open to individual membership. This is an excellent opportunity for members of our profession to join with other professionals in multidiscipline cooperation in developing land information systems.

This latter part of the 20th century is marked by the emergence of an infor-



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mation society and by a more functional organization of Society and the State. It also carries the opportunities of new frontiers for humanity. As the philosopher Spinoza wrote 300 years ago: humanity will take a giant step forward on the day that it is able to de-centralize as easily as it can centralize. This is now possible with computers; small personal computers will allow everyone to receive information, process it and make decisions. This new era offers society new opportunities for greater freedom. This will however only be possible if people are willing to assume more responsibility.

After having rejected key institutions such as church and the family, people will need to develop new references for ethical conduct. Professions by their function, their responsibilities, and their conduct provide a typical example of attitudes that would lead to greater freedom for our society. What characterizes professionals is their human qualities. Professionals have a high sense of individual responsibility. They have a sense of duty to contribute to the advancement of society. Professionals share a common ideal which put self expression above pecuniary incentives and loyalty above individual advantage. Their standard of conduct is based on

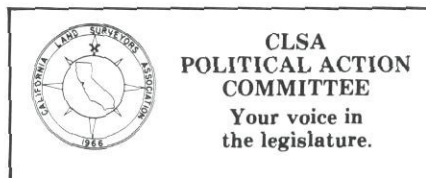
personal service, courtesy, honour and ethics.

To some people, these standards of conduct may sound like motherhood statements. But most people realize, sooner or later, that feelings of freedom can only be felt through conduct that expresses human qualities. In this period of de-regulation and downsizing, professions will be provided with the opportunity to assume more responsibility in their respective fields of expertise. By maintaining their human qualities, professions will continue to fulfill a fundamental role in our society.

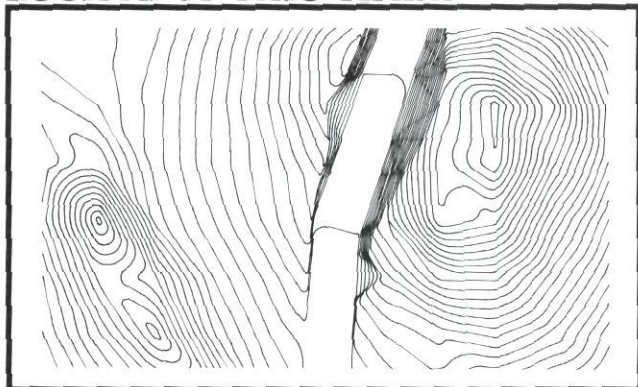
Our profession is the oldest scientific profession. In Rome surveyors were amongst the first liberal professions. The role of our profession has always been to provide land information for the orderly management of land and its resources. Today, the increasing demand for information, and the availability of space age technology, bring new challenges. Close cooperation amongst surveying and mapping disciplines will be required to provide systems and standards for land information systems. Our profession has a definite and significant role to play as the future of our society unfolds. We must look ahead at the challenges offered by the new frontiers and approach them with the same

professional attitudes demonstrated by the surveyors and mappers who opened up this great continent.

Upon reviewing the program of this convention and observing the attendance here, one realizes that the surveying and mapping community has maintained its professional attitude. This week's program addresses the various topics, concerns and challenges now facing our profession. The number of colleagues who have come from all parts of the U.S.A. to share knowledge and experience for the advancement of our profession also illustrates the vital role of professional associations. I am grateful to have the opportunity to participate in this convention and I wish you all a successful week. □



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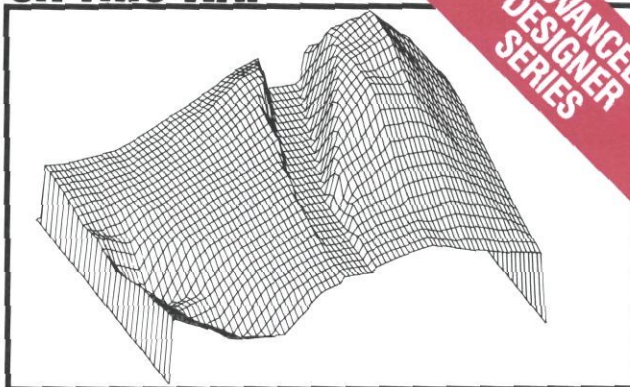
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# Purchasing An Established Survey Firm

by P.J. Stringer, B.Sc., O.L.S.

Many of you will eventually face the agonizing decision of maintaining the status quo as an employed surveyor or casting care to the winds and going out on your own as a Surveyor in Private Practice.

I still recall with absolute clarity the phone call which ultimately changed my life and that of my family. I was settling very happily into what most young surveyors would consider to be a fine career with a large consulting firm in Toronto. As a family, we were living comfortably in a good area of the suburbs and we had been steadily building equity in our home and as well had spent the better part of the past year renovating our modest house to the one of our dreams.

The year before, I had casually mentioned to a man in private practice that if he ever wanted to sell his practice to please give me a call. That life changing phone call came at 7:00 a.m. on a Tuesday morning and all the security, comfort and peace of mind which we enjoyed as a family was swept away, in what now feels like an instant of time.

The man on the other end of the line simply asked, "Are you still interested in buying my business?" We agreed to meet on the next weekend to discuss his plans and within three weeks we had prepared a mutually acceptable draft agreement which we then took to our lawyers in order to have the rough edges smoothed out.

My personal story is probably of little practical interest but what I feel must be pointed out in the very beginning is that if you are going to be in your own business you must be prepared to make sacrifices, and these may include your time, your home, your family and your money. If it is going to be successful, you must be totally dedicated to the project and your family must understand the sacrifices which will be made and they must be willing to support you in this endeavor.

We moved from a four bedroom home in Toronto to a one bedroom apartment located behind the office in the tiny town in eastern Ontario, and there with two small children and a dog! All of the equity from our home in Toronto was put into the business without reserve.

To be honest, I did not know how much the business was worth, or whether or not I was making a good decision or a bad one. I asked various people for advice but no one really seemed to know how to calculate its worth. I talked to my father about it and he said to me that he expected any good business had to pay for itself. This was perhaps the best advice I could ever have received and I would pass it on to you as an essential.

To know whether a particular practice will pay for itself, you must know a few important details about this business, namely:

1. How long has this business been in operation?
2. Does the firm have a reputation for quality work?
3. Are field notes and records properly filed and of good value to the business?
4. Does the business have assets which will be of immediate value to you when the purchase is made?
5. Does the firm have steady and reliable clients (e.g. developers, lawyers, corporations)?
6. Is the firm growing or is it declining?
7. How many employees are with the firm and what is their experience?
8. Does the firm rely on a particular type of work for the bulk of its volume?
9. Is the existing business location visible to the public?
10. What was the gross dollar volume for each year of operation?
11. What profit has the business shown over the past five years?
12. How much competition is in the area?
13. Is the market for surveys expected to change in the near future (e.g. if the business is in a small single industry town, will the closure of this industry adversely affect your business)?
14. Is the existing owner staying in the area and will the existing owner sign and abide by non-competition agreements?
15. Is there work in progress, and if so what is its value?
16. Can phone numbers and post office box numbers be transferred?
17. How accessible are Land Registry Offices?

18. Is the vendor willing to sign waivers protecting the purchaser from any liabilities for previous errors?

19. Is the business being sold at a time of the year when one would expect to have a good cash flow to carry through a slow period?

When you have become reasonably familiar with the business for sale and you have considered the questions above, you will still have before you the ultimate question - how much should I pay and under what terms.

Your ultimate goal should be to buy the business with as little actual cash investment as possible. If at all possible, use the money of banks, relatives, and the vendor to acquire the business. Remember, the business should pay for itself and should carry itself. You will probably use your own cash (about 25% of your estimated annual volume) to get you through the first few months of operation. These months are critical and you should not leave yourself short. Remember that your cash flow will lag behind the business by about 3 months.

Now let us suppose that you are about to acquire a business which has been operating for 12 years and has had a mean gross volume of about \$200,000 for at least each of the last three years and has enjoyed profitability of about 10% for each of those years. The business has three full-time and one part-time employee all with good experience. The business has a good reputation in the area for high quality work and the field notes and plans are properly indexed.

In my opinion, the value of goodwill (being the notes, plans, clients records files, phone numbers, post office box numbers) for a business should be calculated from a combination of gross income, years in business, and profits for that company. It seems reasonable to me that goodwill value is enhanced each year a firm remains in business and the expected result of quality goodwill is higher volumes and increased profits.

I have developed a formula which incorporates these factors and results in a figure for the value of goodwill which could be used as a starting off point in your discussions. It is only developed through experience and has



no value as an accounting tool or in actually determining the worth of a business. The variables and formula are as follows:

GW — Goodwill

GV — Mean annual gross volume for previous 3 years

YB — Years in business in excess of 5 years

P — Mean annual profits in each of last 3 years

$GW = (20\% GV) + (1\% (YB \times GV)) + (20\% P)$

In this example then, the goodwill for the company may be worth as shown below:

$GW = 20\% (200,000) + 1\% (7 \times 200,000) + 20\% (20,000)$   
 $= 40,000 + 14,000 + 4,000$   
 $= \$58,000$

Keep in mind, this is my rule of thumb and may not be valid for the business you wish to acquire.

Having established a price for goodwill, you must now make a complete inventory list of the assets which you wish to acquire, right down to the pencils, pens, erasers and rulers. If you have money available don't be afraid to buy the assets because you will probably pick them up at bargain basement prices compared to the cost of replacing them with new equipment. The existing owner is usually hoping to get rid of most of the company assets during the sale and will probably be willing to sell them to you at very reasonable prices.

Now that you know the total cost of goodwill and assets you must determine the value of work in progress. I prefer to pay the owner up front for the actual time he has spent on work which is in progress and that which will be subject to invoice. I would suggest that you use a basic rate of not more than 70% of normal tariff (i.e. 1.5 x actual salaries) to establish the value of work actually done while the job is in progress. Do not pay for work which is still dependent on client approval to proceed or which may be in doubt. These jobs must be considered as part of the goodwill which you are purchasing.

With the final figure established (except for additional work in progress accumulated between the signing date and the date of take over) you may now begin discussions with the vendor as to how payment of this amount is to be made.

The vendor will very likely be willing to cover a portion of this amount as some type of mortgage on the business. However you should be prepared to pay the owner at least 50% in cash

at closing. You may of course be borrowing some of this amount from lending institutions, friends or relatives and this must be accounted when calculating your monthly budget. One of the reasons I have stressed the use of private money to finance your business is that lending institutions are very uneasy about lending money for the purchase of goodwill. Many banks will not even consider goodwill as a business asset. I will agree that in many businesses this is the case but not so in surveying. The value in the business is in fact the notes, plans, client files and satisfied clients. It may be necessary to have a frank discussion with your banker so that you can explain to him why the notes and records are the integral part of the purchase of an established firm.

During your discussions with the vendor you will probably have touched on matters concerning the vendor's activity with your firm after closing with the vendor, working as an unpaid assistant. This will give you the opportunity to learn the filing system and meet the staff and some of the major clients. After closing, the vendor and purchaser should part ways immediately. You should insist (however politely) that the vendor's role is complete and his presence is no longer required. Plunge into

the work on your own. The vendor's presence will only undermine your efforts and make you less effective and less efficient.

In any business transaction, there must be a certain amount of trust and understanding. The vendor is probably reluctantly parting with something which he has built with his own hands over many years. The purchaser is probably concerned that he spends every penny wisely and that he buys a business which will repay his investment and support his family. It is essential that the individuals involved display the same care, concern and professionalism in dealing with each other as they would with their most valued clients.

There are great potential rewards in operating your own business but unfortunately there are also many pitfalls which must be avoided. The rewards come in the form of satisfaction with a job well done, added financial opportunities and the privilege of being your own boss. In order to avoid the pitfalls, have your wits about you and don't be afraid to ask for professional advice.

If I could somehow turn back the clock to that moment when the phone rang at 7:00 on Tuesday morning, I would — even now — without hesitation, pick it up and go through it all again. □

## Official Surveys Accepted by BLM

This letter is to inform you of cadastral survey plats approved by the Chief Cadastral Surveyor for California during the first quarter of FY 87 (October 1 - December 31, 1986).

These plats are now on file in the Survey Records Office, Bureau of Land Management, California State Office, 2800 Cottage Way, Room E-2841, Sacramento, California 95825.

Township	Approval Date	Type of Survey
T.6N.,R.7W.,SBM	10-03-86	Supplemental Plat
T.15N.,R.16E.,MDM	10-15-86	Dependent Resurvey, Subdivision, and Survey
T.16N.,R.16E.,MDM	10-15-86	Dependent Resurvey and Metes-and-Bounds Survey
T.17N.,R.16E.,MDM	10-15-86	Dependent Resurvey and Survey
T.46N.,R.5E.,MDM	11-10-86	Supplemental Plat
T.6N.,R.6E.,HM	12-01-86	Metes-and-Bounds Survey
T.4N.,R.25W.,SBM	12-17-87	Completion Survey

You may circulate this letter among your membership as well as publish it in your bulletin if you so desire.

Sincerely,  
 Claude W. Hanon  
 Acting Chief, Branch of Cadastral Survey

□





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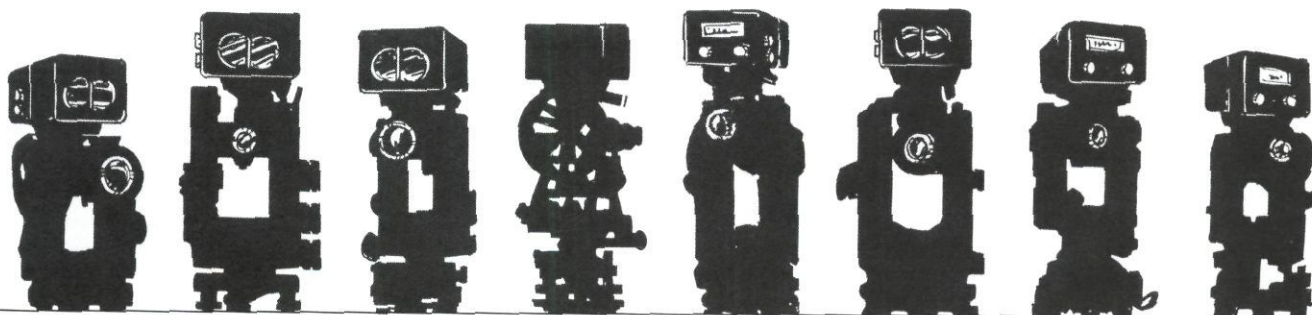
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# The Ethics of the Low Bid Survey

by Dennis J. Moulard,  
USDA Forest Service

I'd heard the story so many times before, I wanted to go and hide. The land owner was sitting across the table from me, his lawyer eloquently expounding on the virtues of law, smugly confident of the great injustice done to his client by the big bad government surveyors. The discussion usually begins on a friendly note; everyone wants to resolve the problem at minimal expense (lawyers jargon for "give up now and we'll be merciful"). But as the plats come out on the table and the Manual is opened to section subdivisions, the tone makes a strange transformation.

An education process is usually the next phase, as the lawyer (in spite of his impressive discourse) as well as the land owner are in need of counselling from a number of view points. First, they must understand the basics of the survey system and the laws relating to it. The lawyers face begins to have that "Oh, I remember that" look, and his eloquence begins to fade. With patience and compassion you explain that in almost any section, you must have all four of the quarter corners to subdivide the section. I show them on a map which corners that would include. The landowner has a puzzled look, realizing that his "surveyor" never went to some of those locations.

Secondly, you have to begin to prepare them for the really big shock – they got the shaft from their surveyor. The land owner tries to explain that he "paid that guy \$1,000", and therefore the survey must be accurate, besides, the surveyor had all these electronic gadgets and a calculator that beeped. How did this happen? I then have to explain that having been in the surveying business myself for 14 years, I couldn't imagine anyone breaking down that section for under \$3,000, even if all the corners are locatable. A spirit of anger enters the room, the "I've been screwed" look appears. I ask how he chose a surveyor, and almost every time the answer is: "I called two or three in the phone book and went with the cheapest". I ask, did they give you a price right then over the phone, or did they come out and look the job over? "Oh no, they gave me a price right then."

I explain the processes required by law. They say "Only the government can afford to do it that way". (A feeling held by some of our own profession,

but a poor response to what the law says must be done). They start to see the natural results of getting a low bid survey. They ask how this could happen? I try to tactfully respond, "You got what you paid for". The lawyers eyes return to that money-making glisten, as he realizes there is still a case to pursue, but with a different target. The landowner leaves the meeting with only one firm concept in his mind – Land Surveyors are a bunch of jerks, certainly undeserving of such adjectives as professional.

We claim that we operate under certain professional ethics, but I wonder, what are the ethics of a low bid? Unless the client is fully versed in the work to be done, and understands the time, cost, and procedures required, he cannot make an intelligent decision, and almost always gets taken. The end loser in this scenario is you and I, the land surveyors who really want to do it right. We all look like a bunch of jerks.

There are only a couple of reasons why any surveyor might be able to do a job much cheaper than the norm. One is if he or she had just completed a job in the same area and had some information that the others would not have. This of course would not occur if he had obeyed the spirit of the law and recorded a plat, which would make all the information public, but that is another subject for another day. Another reason one might be much lower than the norm is if he does not identify the entire scope of the job. Many times clients get a bid which includes "clearing the boundary line", and another bid to "survey" the boundary. The client thinks these are the same, but the surveyor who is going to "clear" is more expensive for obvious reasons. The client may actually want the lines cleared to build fence but goes with the lower bidder, thinking all the proposals are the same scope. We should be sure we understand exactly what they want, and bid very clearly.

But the vast majority of ways surveyors are able to "cut costs" is by simply taking shortcuts. There are a number of ways to do this; you ignore records research (a very time-consuming activity sometimes), you assume all the corners are locatable, you ignore checks on your field work, or you intentionally low-ball the job and make all the normal things (like plats, clearing, descriptions, and monuments) all add-ons. There are no other ways

to come in with a very low bid, and still make any money.

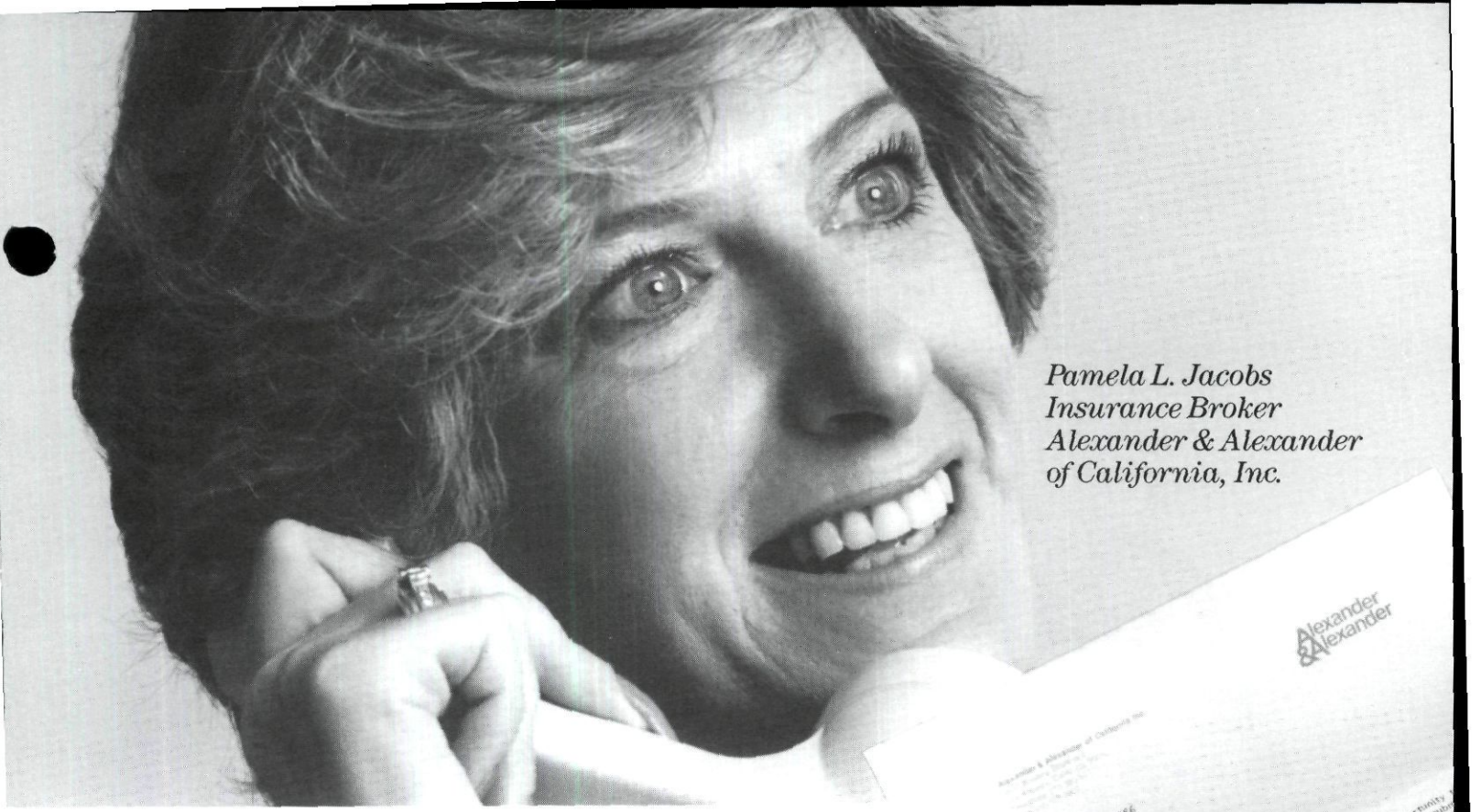
Land Surveyors are making decisions on which of these shortcuts to take every day. What ethics are being violated here? Almost all of them. Not only is the client being deceived as to the scope of work, but he is being cheated out of the opportunity to protect his most valued asset – his land. We as a profession have allowed this "evil" to defraud thousands of unsuspecting landowners. Go back and look at the fundamental principles that ACSM has established in the "Code of Ethics". Low bidding is very unprofessional, yet that's the way we get 90 percent of all our survey work!

I realize the agency I work for contracts for surveying services in this same fashion. Although I see a big difference with bidding for a job with an agency that knows exactly what it wants, needs, and how it must be done, I agree that the current system encourages unprofessional acts. We are determined to make changes in that process. But we make up less than one percent of all surveying activity in the country.

It is going to take a commitment on the part of all of us to absolutely refuse to take any work on a phone bid. We must face the fact that occasionally we must turn down work, knowing they will go elsewhere, simply to preserve the integrity of our firm and our profession. I'd love to see the day when some client calls every LS in the phone book and can't get anyone to bite; they all insist that they need time to study the area, make a brief search in the records, maybe even look for some corners, before they will give a price – a price that fits the exact scope of the work, both technically and legally. Too often our price is guided by the clients budget or the "get it at any price" syndrome. Remember there are only a few ways to shortcut, and they all violate the very principles that granted you a license to begin with. If it cannot be done properly at a fair price, forget it.

The ethics of a low bid are zero. If all of us were doing the job in the same professional and complete manner, then we as a profession would rise in stature and income together. Let's strive for this and actively pursue those who refuse to practice ethically from our profession.

Reprint November, 1986 Side Shots



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The California Surveyor - Spring, 1987



# Landlocked Owner Wants Easement of Necessity

Leland, a retired builder and land developer, sought to find a homesite on a mountain top. He located a 72-acre property held in trust by the Wells Fargo Bank which was willing to sell.

However, Leland was warned "The land could be suitable for a homesite but there is no legal access, no improvements and no developed water." Yet Leland went ahead with the land

purchase.

After acquiring title, Leland asked his neighbor Edith if he could build a road over her land so he could reach his mountain top from a public road. She refused.

Next, Leland researched the title of his land and found that in 1936 his parcel was commonly owned by Edna who also owned the parcel now owned by Edith.

Leland then sued Edith to acquire an "easement by necessity." He alleged that in 1936 his landlocked parcel and the adjoining parcel were both owned by Edna who should have created a road easement over what is now Edith's land. But Edith argued Edna apparently didn't want any road to the mountain top or she would have included it with the landlocked parcel.

If you were the judge would you grant Leland a road easement by necessity over Edith's land?

The judge said no. The general rule is an easement by necessity to reach a landlocked parcel can be created if there is no other feasible access and if at one time there was a common ownership of both parcels. The purpose of this legal principle is to encourage beneficial land use.

In other words, the judge emphasized the law presumes the common owner would have intended to create a road easement. However, "an easement by necessity will not be imposed contrary to the actual intent of the parties," he noted.

After viewing the property and observing a road easement over Edith's rough, hilly land would require extensive grading and lateral support, the judge concluded an easement was not intended by Edna.

Based on the 1986 California Court of Appeal decision in Hewitt vs. Meaney, 226 Cal. Rptr. 349.

- Robert J. Bruss, J.D.

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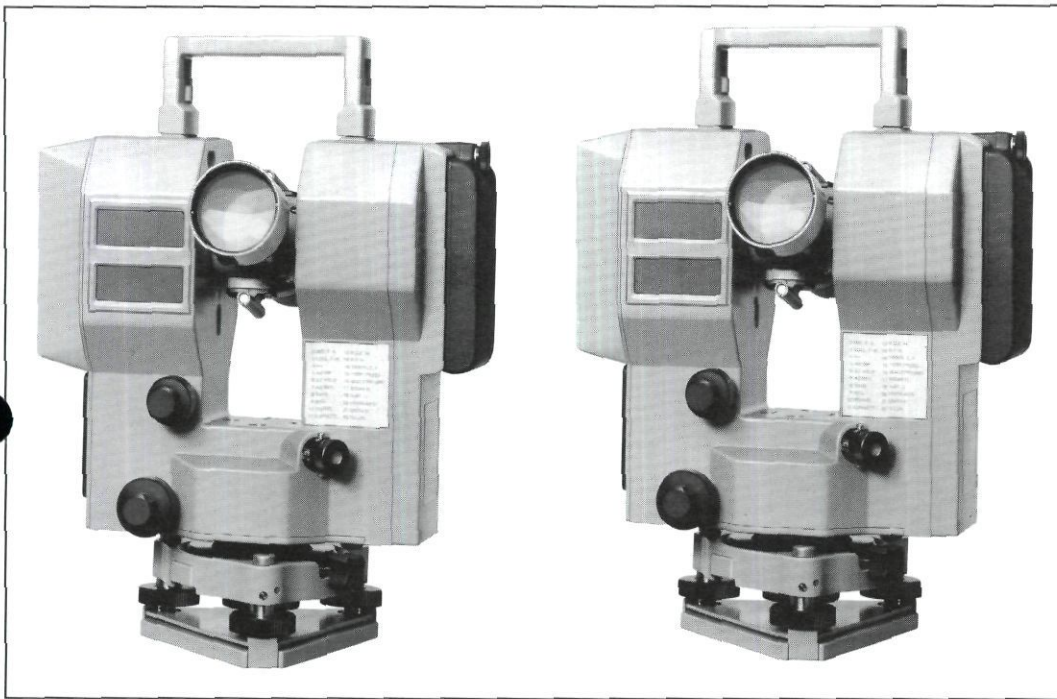
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