

Creating a National Standard Record of Survey

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The information revolution has dramatically altered the way we collect and process our field data, forever changing the surveying profession. However, during this period, when most of the emphasis has been on modern data collection, data manipulation, and computer drafting, the art and science of boundary surveying and boundary resolution has been increasingly neglected. There is a growing number of surveyors preparing maps that reflect poor resolutions, and quality varies widely from surveyor to surveyor and region to region. It is time to stimulate a revival in what has historically been our most important calling—the proper and professional determination of a parcel boundary in its relation to the boundaries of the parcels surrounding it. It is proposed that the American Congress on Surveying and Mapping (ACSM) take the lead and, with the cooperation of the American Land Title Association (ALTA), create a *National Standard Record of Survey*. This can be accomplished by revising both the “NSPS Model Standards of Practice” and the “Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys” to include a section that spells out the main principles of an adequate boundary survey. Surveyors could then voluntarily choose to comply with these standards and indicate that they have done so by changing the title of the map to read: “ALTA/ACSM Record of Survey” and include a short Boundary Statement reflecting said compliance. This concept could also be extended to any of the different plats produced by surveyors that involve a boundary analysis; as with the Basis of Bearings statement, a Boundary Resolution Statement could be added indicating that the resolution conforms to the new ALTA/ACSM Boundary Standard.

My career as a surveyor has been over 30 years in the making. It began in the outback lands of Utah and surrounding states, pounding stakes on a five-person transmission line survey crew. Besides learning how to mash a hub into frozen ground with a full, roundhouse swing of a 10-pound sledgehammer, I also picked up the basics of chaining and reading angles on the vernier of a transit. Then, at a much faster pace than I ever would have imagined, I adapted to electronic distance measurement, total stations and data collection in the field, and computer drafting in the office. I feel as if my career has spanned a period of change and innovation like no other in the history of this ancient profession. However, something has been left behind somewhere between the steel chain and the computer—a properly resolved boundary.

While surveying my way through college I worked for the Utah Power & Light Company. It was around 1975 that a company approached my department and tried to sell them an EDM, but they were unsuccessful because the department head could not be convinced that the results were reliable. A few years later, after moving to California, I worked for a small firm that purchased a Hewlett-Packard EDM that we swapped with the theodolite while doing boundary work. This slick new instrument was quickly assimilated

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into our daily routine. Around this time I decided that I wanted to learn more about what was done in the office with these field-collected data.

Our firm did a fair amount of construction staking, which, once learned, was really not all that challenging. One learned the correct technique, and then it became a matter of learning how to speed production without making mistakes. It was boundary analysis and resolution¹ that intrigued me. Here was something to really sink your teeth into, and I started an intensive study program, reading everything I could to gain an understanding of this intricate practice. It became obvious right away that boundary analysis was a subject that made one appreciate the adage: The more you know about it, the more you realize what there is to know.

For the greater part of surveying history it has been the location of property boundaries that defined the essence of what surveyors do. From relocating the markers lost by the annual flooding of the Nile, to the establishment of sectionalized

¹ I use the term “resolution” to refer to the entire process of analysis whereby a surveyor studies all the available evidence and applies historically accepted law and practice to arrive at a solution for the location of the parcel boundary in question... a solution that necessarily places the boundary into the matrix of parcels which surround it.

land in America, boundary work was our most valued product. Yes, construction layout and topographic work has always been performed to some extent, but this type of survey never rose to the same level of importance as boundary survey. Until modern times, that is. Now it is the reverse. Data acquisition (topographic surveys), data manipulation (from processing to mapping), data application (construction layout and staking), and GPS have all become the darlings of the industry. From vendor's displays at conventions, to any of the trade publications it is obvious that data manipulation is what everyone is thinking about and doing.

Modern preoccupation with "data" has contributed to a decline in boundary skills. I am convinced that the overall quality of boundary work being done in our country has declined in the past 20 years. Time after time I come across maps that show a critical lack of boundary analysis, or none at all. I am licensed in six western states and have had the occasion to talk to many surveyors about this issue. I have studied maps that were submitted for consideration in national mapping contests and I have talked with surveyors from around the country who concur that the quality of boundary mapping has deteriorated over recent decades.

What too many surveyors either do not understand or are simply failing to do, is to conduct a thorough analysis of all available records and all available field evidence under the guiding principles of a proper boundary determination. Basic concepts such as knowing the difference between simultaneous and sequential conveyances, or senior vs. junior rights, are completely missing from many maps. A disturbing number of professionals seem to think that the only obligation one has to an adjoiner parcel is to quote the book and page reference for its vesting document or map.

The question then becomes: Given the increasingly poor quality of boundary resolution, what can we do to reverse this trend? Some states have begun to change their laws and board regulations to more rigorously spell out what needs to be included in a boundary resolution. Texas is one notable example. In their General Rules of Procedures and Practices surveyors must observe the following:

§663.16. Boundary Construction

(a) When delineating a property or boundary line as an integral portion of a survey, the surveyor shall respect junior/senior property rights, footsteps of the original surveyor, intent of the parties involved, the proper application

of the rules of dignity or the priority of calls, and applicable statutory and case law of Texas.

(b) Appropriate deeds and/or other documents including those for adjoining parcels shall be relied upon for the location of the boundaries of the subject parcel(s).

(c) A land surveyor assuming the responsibility of performing a land survey also assumes the responsibility for such research of adequate thoroughness to support the determination of the location of intended boundaries of the land parcel surveyed. The surveyor may rely on record data related to the determination of boundaries furnished for the registrants' use by a qualified provider, provided the registrant reasonably believes such data to be sufficient and notes, references, or credits the documentation by which it is furnished.

(d) All boundaries shall be connected to identifiable physical monuments related to corners of record dignity. In the absence of such monumentation the surveyor's opinion of the boundary location shall be supported by other appropriate physical evidence which shall be explained in a surveyor's report.

While I applaud these board rules, a strong argument could be made that they should have been enacted as statutory law. All avenues for strengthening boundary work should be addressed, including state law, state board rules, continuing education, degree requirements and national standards of practice. It is the purpose of this article to recommend a new method for encouraging proper boundary work—the creation of an *ALTA Record of Survey*.

It is my understanding that the ALTA/ACSM Land Title Survey (ALTA Survey) was created back in the mid-1950s, in large part because the title industry wanted to create a more dependable, uniform map product for insurance purposes. It has been said that the title insurance industry felt "...the need for a formal, printed standard. There is also, regrettably, an inconsistency in the quality of service provided by the surveying community. This inconsistency occurs not just from region to region, but within each region of the country. Two different surveyors practicing within a few blocks of each other may deliver surprisingly different levels of quality of survey. The purchaser of the service needs some assurance of the quality of

service to be expected. That is where standards become necessary.” (Foster 1992).

The ALTA Survey has made great strides toward achieving this goal. It is noteworthy, however, that even the ALTA Standards—like virtually all state statutes and most board regulations—specify in great detail how maps should look and what should be contained therein but fall silent on what is expected of the boundary resolution itself. Aside from requiring that adjoining recording data “be shown,” and that any gores or overlaps “be clearly indicated,” it is merely assumed that the surveyor will follow good practice in resolving the parcel boundary.

The time has come to stop assuming that licensed surveyors will follow historically accepted principles of boundary work and begin spelling out what constitutes a proper boundary analysis in our regulations, laws, and standards. Despite the error of omission mentioned above, the ALTA Survey has, for many people, come to represent the highest standard of quality for a parcel survey. What I would suggest is that an ALTA/ACSM Record of Survey be created. This would be a type of map that surveyors across the country would voluntarily choose to produce. It would be similar to an ALTA Survey, in that it would adhere to the same general principles of accuracy and thoroughness, but it would be adapted to apply to the garden variety Record of Survey.²

The appearance of such a map would largely be the same as for a regular Record of Survey, with the exception of the title (ALTA/ACSM Record of Survey), and a Boundary Statement to the effect that “The boundary resolution shown on this survey plat was prepared pursuant to the standards of practice for an ALTA/ACSM Record of Survey as defined and promoted by the American Land Title Association and the American Congress on Surveying and Mapping.” What the surveyor would be doing is clearly stating that he or she has voluntarily chosen to raise their level of work on that particular survey to high standards of practice. That standard would include, among other things, specific language about what constitutes an acceptable level of thoroughness for the boundary portion of the map. It would also contain guidelines for accuracy and for the treatment of easements. In general, it would make *explicit* what is typically *implicit* in most state laws and regulations.

It is interesting to note that even in the NSPS Model Standards of Practice (Section B) (NSPS 2002), the actual components of a boundary

analysis are only broadly sketched. After calling for research of pertinent documents and a diligent search for physical evidence in the field, these standards sum up the analytical portion of the process by simply stating that the surveyor shall “Compare and analyze all of the data gathered and reach a professional opinion as to the most probable location of the corners of the property.”

The trouble with such generalizations is that too many surveyors interpret them in the least rigorous manner possible. For example, since the NSPS Model Standards do not spell out that one *must* take into account the document of record for each adjoining parcel and demonstrate that each one is or is not compatible with the subject parcel, many surveyors will consider this principle satisfied by simply stating the book and page of the documents of record on their maps. How do I know this? Because I have seen it time and again in the course of reviewing maps in numerous states. In California I have had personal conversations with experienced surveyors—even official County and City Surveyors—who believe that we are not required to do anything beyond merely “showing” or “listing” the record references for adjoining parcels. I have personally worked on many projects where previously recorded maps failed to discover gaps or overlaps because they did not survey across adjoining parcels to discover whether existing monuments gave those parcels their record widths. If you do not, in effect, survey and resolve the boundaries of your subject parcel *together with* each of the parcels surrounding it, how can you claim—or imply by your silence—that there are no conflicts between your client’s parcel and the parcels which surround it?

It is my view that this last statement summarizes the essence of what any normal property owner would expect of a surveyor—do my boundaries conflict with my neighbors? That this expectation is not spelled out in state laws, regulations, or industry standards is inexcusable, especially when it is known that the principle behind it is widely misunderstood or ignored by practicing surveyors around the country. If ACSM would take the lead and expand on the Property Survey section of the NSPS Model Standards, this document could serve as the basis for a national standard Record of Survey. Then, if ALTA would join in the effort and lend their name to the new, voluntary map, much credence would result and the ALTA/ACSM Record of Survey would, by virtue of its name alone, have a headstart in recognition and accep-

²Terminology may vary from state to state, but by “Record of Survey” I mean any type of map that is recorded or filed in order to document a boundary survey, as opposed to maps that are required for a division of property.

tance by the survey community and allied professions and the general public.

Section B of the NSPS standards is a great beginning for a national standard Record of Survey. There are nine subsections in Section B. I propose that an additional subsection be added, entitled “Boundary Resolution,” and contain guidance on:

- Determining the type and extent of boundary surveys;
- Information gathering; and
- Analysis and resolution.

Determination of the Type and Extent of Boundary Surveys

Boundary Resolution. The term “boundary resolution” shall refer to the entire process of analyzing all available, pertinent information relating to:

- The location of the boundary of a given subject parcel;
- The relationship of that boundary to the matrix of parcels (and/or rights-of-way) that surround it; and
- A determination of whether or not there exists any inconsistencies or incompatibilities in any of the boundaries so located.

Parcel Matrix. A “parcel matrix” varies in nature from state to state and region to region, and it is unique for each neighborhood of parcels. The matrix is defined as that cluster of parcels surrounding the subject parcel being surveyed, which extends far enough in all directions to take into account the history of parcel divisions in that area, the type(s) of divisions that lead to the creation of the subject parcel (simultaneous, sequential, or a combination of both), and, once understood, allows for a proper and complete plan for field work and office analysis that will allow for a resolution of the subject parcel boundary. This may require extending the survey and analysis to include only one additional parcel in each direction if, for example, the subject parcel and all the immediate surrounding parcels were created simultaneously. But in all cases, at a minimum, the subject parcel and all adjacent parcels (or rights of way, etc.) must be included if the surveyor is to determine the presence of any gaps or overlaps in record information.

For a successful and cost-effective field survey it is critical to conduct a preliminary deed investigation to determine what basic type of deed situation exists within the parcel matrix being surveyed—Is it a GLO public lands/cadastral parcel, or a lot and block subdivision, or sequential metes and

bounds, or a combination of these? The surveyor shall assess how many parcels need to be included in the boundary resolution process in order to make sense of the parcel matrix in question. At minimum the matrix will include the subject parcel and every bounding parcel that adjoins it. Circumstances may however require that the research, the field survey, and the analysis be extended to additional parcels beyond those that are immediately adjacent to the subject parcel. Additionally, circumstances may also require that a chain of title search be performed on one or more of the parcels in the matrix, in order to settle any junior/senior rights issues.

In the case of a Record of Survey it is recognized that, depending on the wishes of the clients and the judgment of the surveyor, not all of the boundary lines of the subject parcel need be surveyed. The extent of the matrix may be adjusted accordingly. However, in all cases, the analysis needs to be sufficient to insure that no other parcel is being adversely affected by the location of a particular line.

Information Gathering

All of the following types of record and non-record information should be considered, obtained, and analyzed in the process of resolving the boundary of any parcel.

Record Information

All record information relating to the boundary survey should be obtained. This should include, at a minimum, the current vesting deeds for the subject parcel and all surrounding parcels. However, depending on the situation, it may also be necessary to obtain the vesting deeds for additional parcels in order to understand the proper relationships of all the parcels in the area in question. In addition, all record maps that have any bearing on the location of the subject parcel—or the parcels adjoining the subject parcel—should be obtained and analyzed.

Non-record Information

All non-record information for the subject parcel and surrounding parcels shall be obtained. This may include, but not be limited to, such information as: railway maps or deeds, highway maps or deeds, GLO maps and field notes, county and/or city maps and improvement plans, easement deeds, the testimony and opinion of the owners of property in the area (or any other person with

pertinent knowledge about boundaries or monuments), utility company maps and documents, and any unrecorded maps or other information on file at private survey or engineering offices. Such information will vary from one region to another and all reasonable efforts should be made to obtain as much useful information as possible.

Field Survey Information

All types of monuments, those of record and those not of record, shall be tied in the field, along with any lines of occupation such as fences, hedges, structures or roads. Such information shall be collected for the subject parcel and all contiguous, surrounding parcels and, depending on the circumstances, other nearby parcels as well. The distance that the survey shall extend beyond the subject parcel (and the adjoining parcels) will vary depending on the number and quality of the monumentation found in the field, and also upon the nature of the legal descriptions in question (lot and block vs. metes and bounds for example).

Analysis and Resolution

A boundary resolution is the analysis of all of the above information such that the surveyor can determine the location of each property line defining the subject parcel in its proper location relative to the parcels surrounding it. The surveyor shall determine what survey and legal principals are pertinent to the survey in question and then perform all calculations and analysis necessary to properly apply those principals to the survey at hand.

The resolution process must take into account the boundaries of all abutting parcels, so that a determination can be made that there are (or are not) any discrepancies along any of the boundary lines in question. All sources of errors and inconsistencies should be considered—between deeds, maps, monuments, or lines of occupation. Any discrepancies that are found shall be clearly and plainly described on the map being recorded, along with documentation and references that explain the reasons for the discrepancies, and, whenever possible, the surveyor's solution to the problem. To this end, efforts shall be made to reconcile such discrepancies by whatever means are legally available to the surveyor. This may include correction deeds, lot line adjustments, quit claims, quiet title, and cooperation with other surveyors who have worked in the area to resolve any differences between their surveys.

To make it clear to those who will examine the map in the future:

The surveyor shall either place a written statement on the plat which explains the resolution or show sufficient notes and comments, together with angles, bearings, and distances (record vs. measured) on the map portion of the plat, or provide a combination of both. The intent shall be to remove any doubt about how the surveyor arrived at the resolution shown on the map.

The National Society of Professional Surveyors could, if it so desired, be the sole agency for creating the standard because it already has a Model Standards document, and because it is the lead national surveying organization. The reason for including the ALTA organization in this article stems from the long history and strong reputation of the ALTA/ACSM Land Title Survey. It would seem to be a logical extension to bring a national standard Record of Survey partially under their umbrella, taking advantage of the "brand recognition value" of a map title with their names included. By now there are many people in the allied professions who know about ALTA Surveys, and they would therefore be quick to understand the concept behind a map with the title of "ALTA/ACSM Record of Survey." However, ACSM could champion this cause on its own, and it may be unnecessary to involve ALTA.

Aside from sponsorship issues, the most important idea is that a national standard be clearly established by making explicit what is now usually implicit—we need to spell out the principles behind a quality boundary resolution. It is not enough to assume that surveyors understand, and will follow, the principles they were supposed to have learned in the licensing process. Court decisions in recent years have started to dismantle the old concept of "local standards." By developing a National Standard Record of Survey we would demonstrate our willingness to align our formal standards with this judicial trend, and also provide a way for surveyors across the country to voluntarily raise the quality of boundary surveys. It is worth noting that all the different types of maps produced by surveyors anywhere in the country would be improved by adhering to this proposed, voluntary standard.

Boundary Statement

Parcel maps, subdivision maps, topographic maps, or any other type of map or plat could have the

following short “Boundary Statement” included, along with any other important information:

The boundary resolution shown on this survey plat was prepared pursuant to the standards of practice for an ALTA/ACSM Record of Survey as defined and promoted by the American Land Title Association and the American Congress on Surveying and Mapping.

Like the *Basis of Bearings* and *State Plane Coordinate Statements* (explaining the datum and epoch of the information gathered), a *Boundary Statement* would add valuable information to anyone examining the map and provide a level of assurance that a sound, defensible boundary analysis was performed. As we all know there are two messages conveyed by a paragraph on a map which explains the datum, epoch, and metric-feet conversions. There are the important facts about the data gathering which future surveyors can use to better interpret the map. But equally important there is the implicit message that the surveyor who prepared the map is competent and professional enough to understand the principles involved and how they should be applied. Similarly, a *Boundary Statement* would indicate to all that the surveyor has applied a rigorous analysis to the resolution shown on the map, and that he or she is not hiding behind the ambiguity and brevity that plagues most state laws and professional standards.

There are those who are repelled by the call for more legislation or any other such attempt to “dictate” how they do their work. But a *laissez faire* approach reaches a point of diminishing returns if it fails to clarify the elemental ingredients of an acceptable boundary resolution. I am not propos-

ing that we micro-manage surveyors. Rather, I suggest that the public can only be served (and protected) if, first, we are in clear agreement about what it takes to complete a good boundary survey, and second, if we take definite steps to hold ourselves—and each other—to the fundamental principles of our honored profession.

Many have commented that surveying is a dying career. I know one thing for sure: incomplete, nebulous, or cursory legislation and standards of practice can only hurt us. I believe that the time has come to address the issue of a national boundary standard for the Records of Survey and to begin incorporating *Boundary Statements* on all of our maps.

The purpose of this paper was to make suggestions, get the discussion started, and to facilitate a debate which leads us forward.

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