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10 Best Practices for Very Large Boundary Surveys

I haven't run across very many easy boundary surveys. Even most of the "small" ones can be quite complicated. However, large boundary surveys come with additional challenges. This article reveals 10 of the best practices I have developed to deal with the challenges of boundary research and data management.

Definition

A very large boundary survey may involve extensive field work over a number of weeks, and possibly different seasons, with office research, analysis, and drafting that can take several weeks or months to complete, such as large right-of-way acquisition projects and surveys of large industrial, commercial, agricultural, or government property holdings.

Parcel size (area), the number of parcels, the number of property corners, and the number of adjoining parcels are all factors that can add to the complexity of a boundary survey.

Special Challenges

Very large boundary surveys present challenges in terms of prolonged, or multi-threaded, schedules, large amounts of data, involvement of multiple personnel, and challenges of coordinate distortion over large areas.

Best Practices for Research

Research is a critical component of any boundary survey. Two dangers that can arise when performing the research for a very large boundary survey. The first is

that an important document impacting the ultimate boundary resolution in the survey is not found or discovered. The second is that the document is discovered, but that it is overlooked in the document analysis step or it is not carefully examined. The following practices can minimize these dangers.

#1 Track Research Coverage Geographically

At the beginning of the research process the surveyor in responsible charge should consider how to track boundary research geographically. For example, the subject parcels and adjoining parcels can be grouped into logical regions for research completion. The completion of

research for each region can be tracked on a map or in simple spreadsheet.

#2 Identify Components Requiring Special Research

The surveyor in responsible charge should review the entire project area to identify areas that will require special research. These include areas such as utility corridors, water bodies, and transportation corridors that may be easy to miss. For example, on one very large boundary survey I performed I was so concerned with the research for the 10 or so subject parcels, three railroad right-of-ways, and four public streets that I neglected to realize the navigable slough encompassed by the

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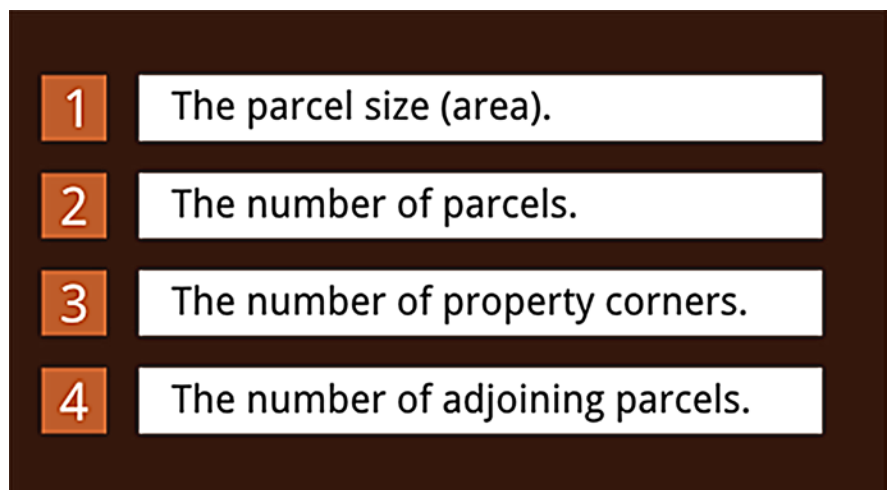


Fig. 1: Factors of a very large boundary survey.

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project was in a Spanish land grant. As a result it was in private ownership, not public ownership. To complicate matters, the ownership of the bed of the slough had been severed from the upland parcels and was divided into two parcels. The parcels were separated by the thread of the stream, and the ownership of one of these riparian parcels had been lost in the record. Special title research was required to identify the current owner.

#3 Track Research Coverage By Adjoiner Parcel

On a recent very large boundary survey completed by my company we surveyed a large agricultural ownership with more than 100 adjoining. Any good boundary surveyor will review at least the grant deeds for the adjoining parcels. It is also good practice to consider junior/senior rights as they relate to the subject parcel and the adjoining. On a large boundary survey, it is easy to miss a review of these items on some of the adjoiner parcels. The land surveyor in responsible charge should use a checklist to make sure an appropriate review is performed for each one of the adjoining.

#4 Document the Review Process

I complete a research log every time I perform boundary research for a project. The log identifies the source of my research, the objective, and the results. A good paper trail is very valuable when dealing with a large amount of research.

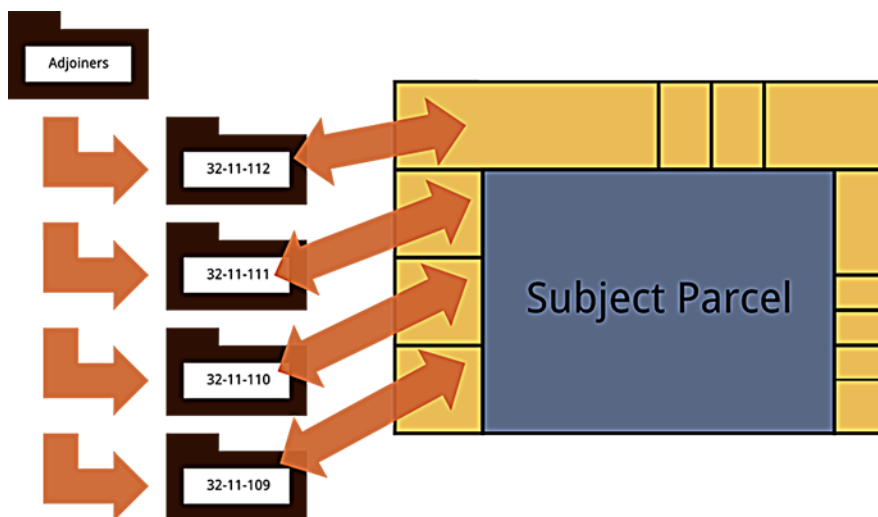


Fig.3: Track boundary research for each adjoiner to your subject parcel.

#5 Schedule Regular Updates of Research

The work on very large boundary surveys can often extend for several months or even a few years, depending on the project. On these projects it is important to schedule regular updates of your boundary research. During these updates it is important to check for survey maps or deeds that have been filed or recorded since your initial research was complete. Before the project is completed, updated preliminary title reports and grant deeds should be acquired for your subject parcels. Any new adjoiner deeds should also be obtained and reviewed.

Data Management

Data management is a major challenge on very large boundary surveys. To successfully execute a very large boundary survey good data management is a must. The following 5 best practices are related to data management.

#6 Organize Digital Files Into Subfolders

I've worked with several other surveying companies that use the "bucket approach" to digital file management. In this approach all the digital files for a project go into a single project folder, or "bucket". That includes all drawing files, maps, deeds, photos, and data collector files. Although this is a simple approach to file management, its shortcomings quickly become apparent on a very large boundary survey. This is especially true if a consistent and logical file naming standard isn't followed by everyone working on the project. Without good file organization, it is

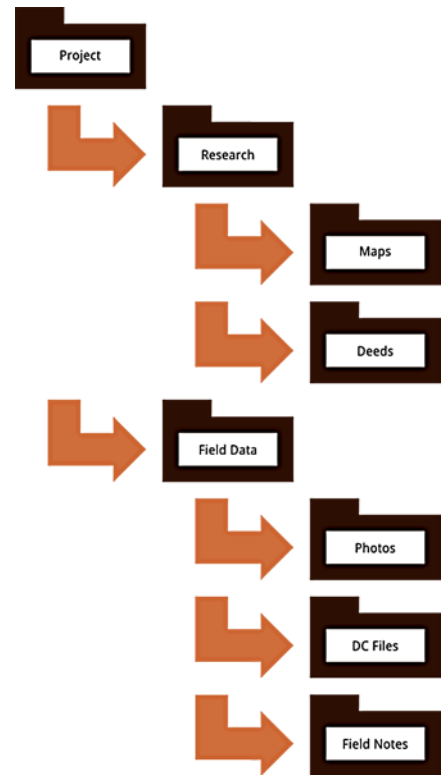


Fig. 2: Don't use the bucket approach to file management. Organize your digital files into subfolders.

easy to waste time searching for files or trying to recover accidentally deleted files from the project "bucket".

Instead of using the "bucket" approach to file management, try using a project folder in which digital files are located into subfolders. Although this approach can be taken overboard, a folder organization scheme with only three (3) or four (4) levels is quite manageable. A good folder structure will allow staff working on the very large boundary survey to quickly locate and work with the digital files for the project.

#7 Storing Field Measurements

On a small boundary survey you may capture all of your field measurements in a single data collector file. This probably won't be the case on a very large boundary survey. On these larger surveys, multiple data collector files will likely be produced over the life of a project. For example, on a very large boundary survey to establish and monument an agricultural property holding data collector files could be produced (1) during field surveys to establish survey control,

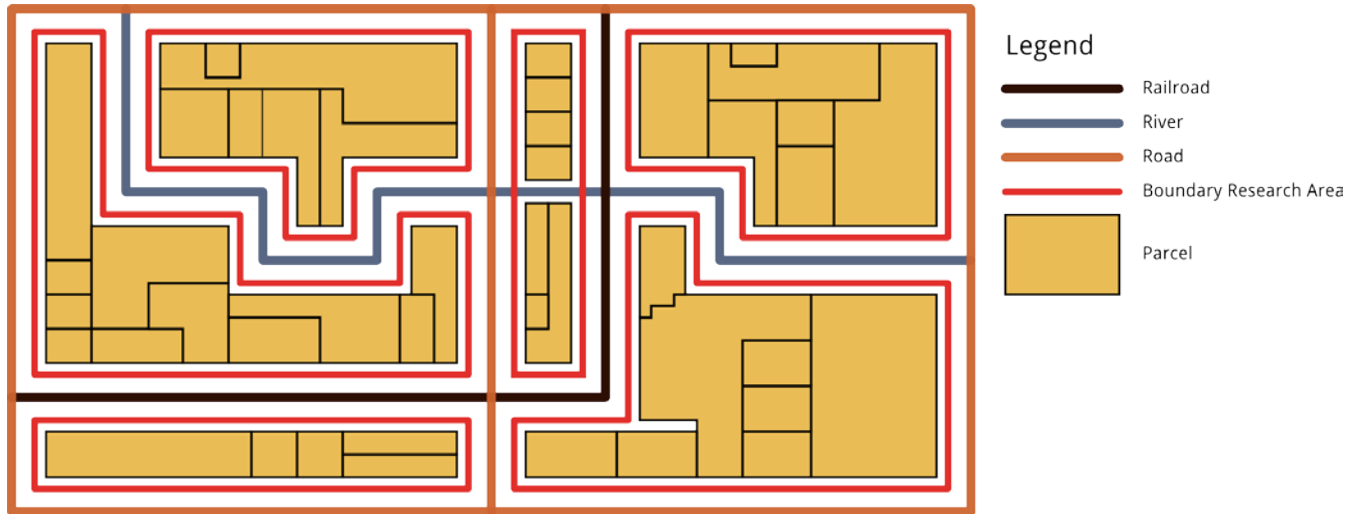


Fig. 4: Divide your boundary research task into areas separated by prominent geographic features to ensure thorough research coverage.

(2) field surveys to locate property corner monuments and physical occupation, (3) during field surveys to set and locate property corner monuments. My company stores all of these data collector files in a single sub-folder of the project folder. The data collector files are named with the date of the field survey and the initials of the party chief. You might also organize the data collector files by instrument type, survey phase, or party chief. All these strategies for organizing field measurements have their advantages. The important thing is to pick a strategy and stay consistent. You might also use a spreadsheet to track the date, purpose, point number range, and field crew for each field survey on the project.

#8 Storing Field Photos

With the advent of digital cameras, there is no good reason for your field crew to return from a field survey without photos. I'll cover the use of digital photos in boundary surveying in a future article. For the purposes of this article, let's assume your field crews are returning with lots of digital photos. These can be stored in a single subfolder of the project folder, but this requires a good file naming convention. It may make sense in your organization to use the same prefix for digital photo names that you use for data collector files. You might also choose to organize photos into subfolder by date, party chief, or subject. I typically organize photos by date. The one exception to this policy for digital photos of property corner monuments. I store those using a

different technique described in the last best practice for this section.

#9 Deeds and Maps

I'm confident you are storing digital copies of all the maps and deeds you acquire through boundary research on your surveys. On a very large boundary survey this can result in a lot of digital files, and in some cases multiple deeds or maps for the same parcel. Select a good strategy for storing these digital files. This includes a subfolder structure and a naming convention. You could organize files by parcel identifier (like tax assessor parcel number), geographic region (like PLSS section), or by document type. I organize these files by document type. They are named with the document type and date of recording or filing in the file name prefix.

#10 Corner Identity, Character, History, and Resolution

I saved this very large boundary survey best practice for last because I believe it is the most important. After all, evidence of property corner location will likely be the single most important factor in your boundary resolution.

What information needs to be tracked about property corners during a boundary survey? At a minimum, you need to know about the history of the property corner, the character of the monuments formerly and currently marking the corner, and your resolution for the position of the property corner. On a large boundary survey, it can easily

become difficult to track this information for each and every corner. For example, a recent boundary survey completed by my company involved tracking information on over 200 property corners.

How can data tracking for property corners be set-up and managed? I recommend, at a minimum, a spreadsheet. Assign a unique identifier to each property corner in your survey. In the spreadsheet, track the history, current character, resolution, and position of each corner. You might also maintain a subfolder for each property corner where you store photos of physical occupation near the corner location, photos of any found monuments marking the corner, and photos of any set monuments or monument rehabilitation you perform before the survey is complete.

Conclusion

The 10 best practices that I described within this article are simply suggestions developed from my own practice. Even if you decide not to adopt them, I encourage you to think about how you handle the unique challenges in boundary research and data management on very large boundary surveys. Taking the time for a little planning ahead of time can save your organization a lot of time and money.

If you hesitate to tackle a large boundary survey because of the complexities involved, try implementing these best practices on the smaller boundary surveys you already do. That may give you the confidence you need to tackle larger surveys when the opportunity presents itself. *A*