

Mapping Fee Properties for Access Midstream's Right of Way Group

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Introduction

In the oil and natural gas industry, knowing what you own and where it is located can be effectively managed using Geographic Information Systems (GIS). Access Midstream (Access) uses GIS to keep track of its company assets, including their fee properties. Fee properties are purchased land properties accompanied with full ownership rights. They are typically used for site locations developed for permanent uses – primarily field offices or compression facilities. Access' Right of Way (ROW) group requires that fee properties are mapped into GIS to allow tracking and viewing in the GIS parcel layer. This tells ROW agents and company employees the parcel's status and utilization.

For my internship summer project, I used Esri's ArcGIS Desktop and their Coordinate Geometry (COGO) tool to map and attribute 134 different parcels of land, allowing them to link within Access' GIS and ROW systems.

Methods

For this project I was responsible for mapping and entering the appropriate attribute information of 134 fee properties in Access' GIS environment. Information collected from the company's land database was used to collect the parcel survey information for all the properties. The documentation used consisted of title deeds, plats and other survey records to determine the metes and bounds of each parcel, as well as other appropriate information for the feature attributes. I then used the COGO tool to map each land parcel based on the metes and bounds identified in the surveys.

Using the Traverse Box on the COGO toolbar, I systematically entered the direction and distances for all lines of the parcel. The final step was to overlay each drawn parcel on aerial imagery and company asset information to ensure correct placement. This last step double checked the geographic reality of the drawn parcel and is necessary to ensure the overall spatial integrity of Access' land assets.

Process

While the mapping and georeferencing process for the fee properties was simple, there were several challenges on this project. The first was reading and interpreting the survey information. The use of vague deed language, (i.e. "Witnesseth," "Hence" and other older English) made the process of reading the deed's survey information difficult and required more time to collect what was needed for mapping.

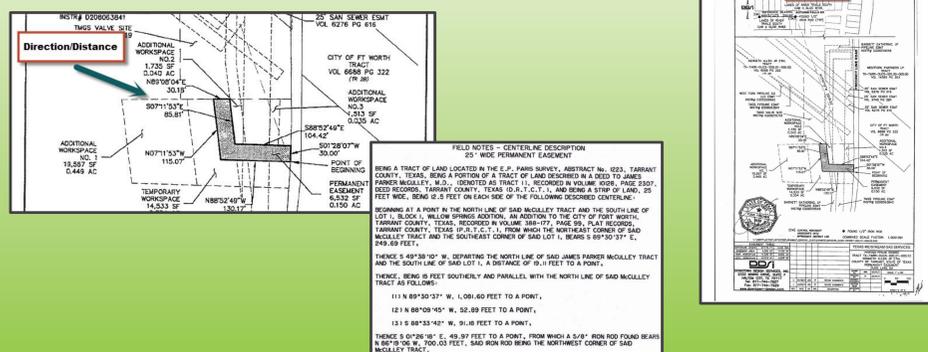
Second, surveys were not always consistent in the use of reference points. Sometimes the surveyors would utilize the Public Land Survey System, well documented property lines or other well-referenced traverses. However, the objects used for reference points often included less helpful markers such as fences, posts, stones, trees or iron rods in the ground. While helpful to the surveyor at the time, they are not helpful now because of limitations with aerial imagery, insufficient surface ownership data or changes to the landscape.

A third issue was caused by a lack of updated surface ownership information. Occasionally the land survey found in a deed would use an adjacent property line as a reference, but over time, the listed owner would sell and merge into other properties. I was able to overcome this challenge by looking through secondary surveys and referencing other points of the parcel.

Finally, there were issues on the GIS side that needed to be resolved. There were times when the surface ownership layer I had would have conflicting or misaligned property boundaries. These had to be considered before mapping the properties. This was resolved by remapping adjacent parcels when able, or re-projecting the layer to ensure spatial consistency for mapping with the data frame.

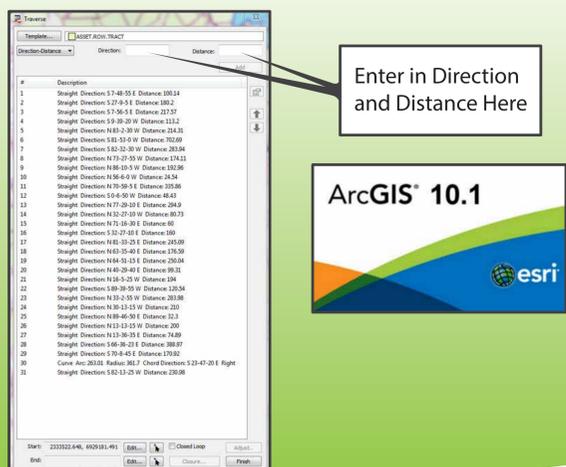
Step 1

- Access' Land database was used to gather the survey information necessary to draw in the parcel. Documents such as land deeds, plats and surveys were utilized.
- Traverse, distance and direction between points were determined.



Step 2

- The beginning point of the parcel was determined, and the traverse window within COGO was used to enter direction and distances between feature vertices.
- The GIS easement ID that would be used to tie the feature to information in the land database automatically was entered.



Step 3

- The aerial imagery base map was turned on to determine if: (1) the drawn parcel is in the correct location; and, (2) it generally coordinates with what is showing on the ground and other assets.



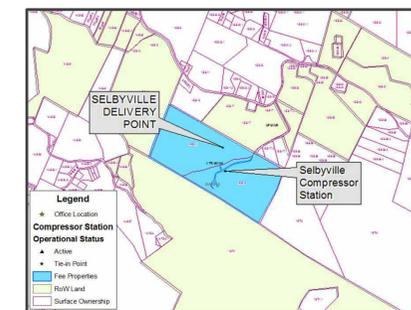
Challenges

Vague Deed Language

WITNESSETH:
That for and in consideration of the sum of One Dollar (\$1.00), and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the said Standard

Insufficient Marker Descriptions

All that certain parcel of land by West Virginia befr
BEGINNING at a 2-inch iron pipe on acre tract, now or formerly of Richard of 91.63 feet from an existing stone Transmission 26-inch Line WB the fo
North 63°08'22" East a distance of 11
THENCE North 47°30'29" East a dista



It is important to ensure that the mapped parcel is consistent with other referenced GIS layers, as indicated in the figure to the left. In this project, I checked that my drawn features were consistent with the surface ownership and adjacent tracts of land already used by Access.

Results

For this project, I mapped or tagged a total of 134 fee properties. There are 160 fee properties currently in Access' land records. This table indicates the spatial distribution of these fee properties by state within Access' operational areas. The data shows clearly that some states have more fee properties than others.

State	Total By state	Total Mapped or Tagged
Wyoming	2	2
West Virginia	8	8
Pennsylvania	10	9
Ohio	11	8
Louisiana	16	15
Oklahoma	21	15
Texas	92	74
Totals	160	131

Conclusion

Mapping fee properties is one example of how Access uses GIS to manage the company's land assets. While there are challenges in dealing with survey documentation in deeds and plats, ArcGIS is very helpful in working through them. Tools, such as COGO, simplify the transfer of survey data into GIS, enabling mapping accuracy of the parcel. Given the role of GIS with the ROW group, along with the management of other assets in the company, it is not only important but necessary to have GIS capabilities like those offered in ArcGIS for Desktop.

