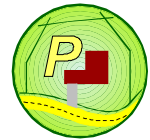


The CEDRA Corporation's COMMAND OF THE MONTH

A monthly information bulletin

April 2005


FEATURED COMMAND
Create a Parcel



Application Description

Users who deal with land record information more than often are faced with the task of transcribing a deed into a digital format. That is, to enter into the computer the deed's metes and bounds, which could be lines and/or curves, in order to create a graphic closed polygon, and store in the associate database pertinent geometric and ownership information. Due to the precision of the deed numeric information (assuming that there are no errors nor blunders), a closed polygon will rarely, if not ever, be formed. Thus an adjustment will need to be made in order to close the figure. This month's bulletin addresses the creation and adjustment of a parcel from record deed information.

The CEDRA Solution

The Create a Parcel tool,  offers the user the ability to transcribe a deed, and perform an adjustment if the deed information does not create a closed figure. This tool may be displayed as indicated below depending upon the GIS system in use:

- ArcGIS® users should activate the CEDRA-AVparcel-Tools toolbar to display the CEDRA-AVparcel-Tools toolbar shown in Figure 1.
- ArcView® GIS users should:
 - Select the {AVparcel Tools} [Tools on Toolbar (Hide/Show)] command, the result of which is shown in Figure 2, or
 - Activate the CEDRA-Deed extension.

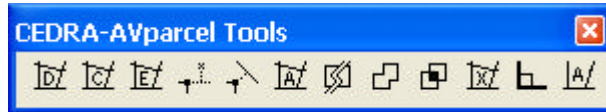


Figure 1
CEDRA-AVparcel-Tools Toolbar for ArcGIS Users



Figure 2
CEDRA-AVparcel Tools on Toolbar (Hide/Show) for ArcView GIS Users

Create a Parcel Tool - Overview

In transcribing a deed, the Create a Parcel tool operates on the premise that there is a starting point. As such, there

Command Of The Month bulletin

This month's issue addresses how to transcribe a deed.

must be an existing point or line feature. In the case of a line feature, one of its endpoints will serve as the starting point of the parcel. Note that the word parcel is arbitrary, since this command can be used for the creation of zoning polygons, wetland delineations and many other types of boundaries.

Given a starting point, the command will display a dialog box from which the user can create both line and curve features. In addition, the user is able to alter the display of the map by panning or zooming in or out of the view. This is very handy because the Create a Parcel command is not terminated when the view is altered.

Create a Parcel Tool - Operation

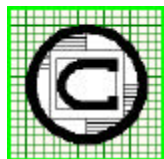
When the tool is selected, the user will be prompted to pick the start of the parcel of land, at which point, the user should pick the appropriate point or line feature. In the case of a line feature, the pick, which is made to select the line, should be towards the endpoint of the line that is to act as the starting point.

Once the pick has been made, the user is asked to select the method of parcel definition, as shown in Figure 3.



Figure 3
Method of Parcel Definition Query

When transcribing a deed, the user will most likely select the third option, Pick POB & Transcribe Deed. The last option is similar to the third, with the exception that the user first defines a tie-line, after which, the parcel is defined. A tie-line is one or more courses that lead from the start point (point of com-



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mencement - POC) that is initially selected to the start point of the parcel that is to be defined (point of beginning - POB).

The first two options in Figure 3 presume that there are existing line and curve features which can be traced to create a polygon feature. Since this month's issue of Command of the Month deals with transcribing deed data we will forego a discussion of these two options.

If the third or fourth option in Figure 3 is selected, the command will query the user for confirmation of the selected feature, as shown in Figure 4.



Figure 4
Feature Confirmation Query

PIN Assignment

Once the selected feature has been confirmed, the tool prompts the user for a parcel identification number, PIN. Every parcel that is defined is assigned a PIN. The PIN value is used to uniquely identify the parcel. If the user is not interested in assigning a PIN to the parcel, a “dummy” PIN may be entered. Note that a PIN must be entered regardless of whether it is to be used, or not.

Shown in Figure 5 is the dialog box that is displayed when the New York State O.R.P.S. PIN format is desired. Figure 6 shows the dialog box when the alphanumeric PIN format is desired. Depending upon the current PIN format that is active, the PIN dialog box will vary in appearance.

The PIN format can be controlled by modifying the *pin.txt* file, which is located in the CEDRA distribution directory. For PC users this is typically,

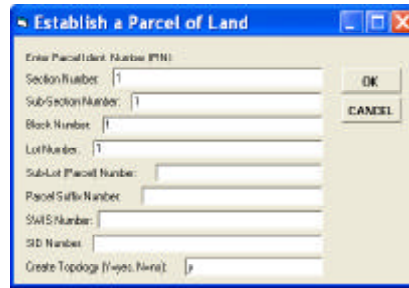


Figure 5
N.Y.S. O.R.P.S. PIN Dialog Box

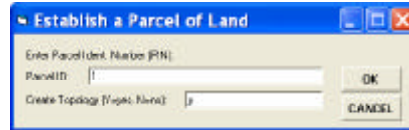


Figure 6
Alphanumeric PIN Dialog Box

c:\cedra\avprjs. The first line in the *pin.txt* file controls the PIN format. A value of 0 denotes that the alphanumeric PIN format is desired. A value of 1 indicates that the N.Y.S. O.R.P.S. format is desired.

Additional information describing the format of the *pin.txt* can be found within the *pin.txt* file, as well as in the AVparcel on-line help.

Parcel Course Definition

Once the PIN has been entered, the parcel course data entry dialog box will appear. Shown in Figure 7 is a sample parcel course data entry dialog box.

The first seven data fields enable the user to define a line or curve feature. Specifically, the first two result in the

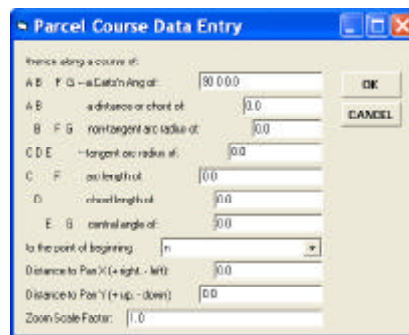


Figure 7
Update Matching Attributes Query

creation of a line feature, while the remaining five are used to create curve features in a variety of different modes.

The eighth data field, the one with the “to the point of beginning” label, is used to terminate the definition of the parcel, while the bottom three data fields can be used to alter the display of the view.

In reviewing the first seven data fields, notice the letter codes A, B, C, D, E, F and G that appear in a vertical fashion. These letters are used to denote the data which need to be entered in order to create a specific type of feature.

Specifically, code A indicates that a line feature is to be created by specifying a direction and a distance in the first and second data fields of the parcel course data entry dialog box.

Codes B, F and G indicate that a non-tangent curve is to be created, while codes C, D and E denote a tangent curve is to be established. Each code establishes a curve using different curve data.

Code B enables the user to create a non-tangent curve by specifying the chord direction, chord length and curve radius.

Code C enables the user to create a tangent curve by entering a radius and an arc length.

Code D enables the user to create a tangent curve by entering a radius and a chord length.

Code E enables the user to create a tangent curve by entering a radius and central angle.

Code F enables the user to create a non-tangent curve by entering a chord direction, radius and arc length.

Code G enables the user to create a non-tangent curve by entering a chord direction, radius and central angle.

Table 1 presents a summary of the said codes and their required data entries.

Type	Code	Data
Line	A	Line direction
		Line length
Tangent Curve	C	Radius
		Arc length
	D	Radius
		Chord length
E	Radius	
	Central angle	
Non-tangent Curve	B	Chord direction
		Chord length
		Curve radius
	F	Chord direction
		Curve radius
		Arc length
G	Chord direction	
	Curve radius	
	Central angle	

When entering a radius value, a positive value places the center of the curve to the right of the direction, while a negative value places the center on the left side of the direction.

Depending upon the type of feature to be created (line or curve) and the data that is available, the user enters the data in the appropriate data fields, after which, the OK button is selected (clicked). Once the OK button has been clicked, the command displays the graphic result. This process is repeated for each course comprising the parcel.

As the courses are entered, the user will see the results on the screen. The line and curve features that are displayed are graphic elements, not features. That is, none of the courses defined are stored to disk. All of the courses are stored in memory, and they are not written to disk until the parcel is terminated.

Note that when defining curves, the direction shown in the first data field will be either: (a) the direction which the curve

will be tangent to, or (b) the direction of a non-tangent curve's chord. Furthermore, when defining curves, the value that should be entered in the second data field should be 0.0, the exception to this rule is when Code B is to be used in the curve definition.

Parcel Termination

A parcel can be terminated in one of two ways. The *first* way is when the parcel closes upon itself. That is, the endpoint of the last course entered matches the start point of the first course of the parcel. When this occurs, the query shown in Figure 8 is displayed.

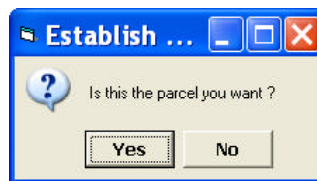


Figure 8
Parcel Confirmation Query

The user then responds accordingly to accept or reject the parcel. If the parcel is accepted, a polygon feature is created and stored in the current active layer. If the parcel is rejected, the command remains active so that another parcel can be defined.

The *second* way a parcel can be terminated is by entering y in the eighth data field. In so doing, the user has indicated to the command that it is desired to return to the point of beginning of the parcel.

At this point, the parcel review choice box of Figure 9 is displayed. In addition, the data shown in Figure 10 is displayed in the status bar area (low left corner of the application window) and reflects the parcel closure error. That is, the difference between the start and end points of the parcel. Specifically, the direction and distance between the

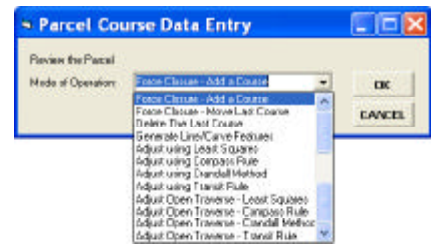


Figure 9
Parcel Review Choice Box

two points is displayed, as well as, the differential distances (DX and DY).

It can be seen from Figure 9 that the user has a variety of choices in determining how to terminate the parcel definition.

The first option "*Force Closure - Add a Course*" terminates the parcel definition by adding a course whose end point will match the start point of the first course in the parcel. This saves the user from having to enter the final course in the parcel definition. It also ensures that the parcel is closed, thereby, eliminating any need to perform a parcel adjustment.

The second option "*Force Closure - Move Last Course*" closes the parcel by moving the end point of the last course entered to the start point of the first course in the parcel. This option can be used when the deed data does not close, and it is not desired to perform a parcel adjustment.

The third option "*Delete The Last Course*" enables the user to remove the last course from the parcel definition. This option can be used when an invalid entry has been made and the user simply wants to delete the last course without having to start completely over. So that, if this option is selected the last course which was entered is deleted, after which, the parcel course data entry dialog box reappears and the parcel definition process may continue.

The fourth option "*Generate Line/Curve Features*" enables the user to create line

Length= 71.74389 Azimuth=215 15 51.8 SW 35 15 51.8 Cartesian=234 44 8.2 (234.735610) DX=41.42136 DY=58.57864

Figure 10 Parcel Closure Error Data

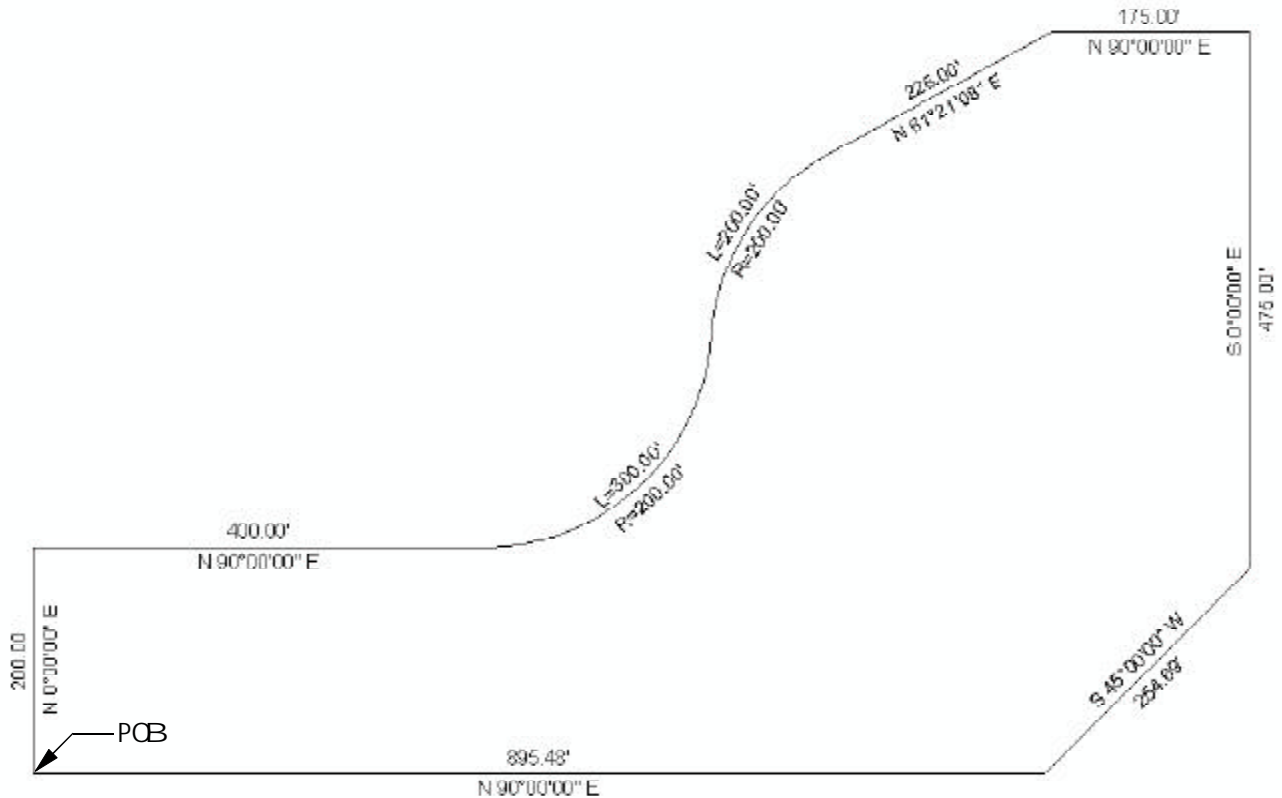


Figure 11 Sample Parcel

and/or curve features for the courses that have been specified. This option can be used when an open figure (string or traverse) is being defined, or when the user simply wants to create line and curve features, and not a polygon feature.

The remaining options appearing the choice list enable the user to adjust closed figures (parcels) and open strings (traverses), using the Least Square, Compass Rule, Crandall or Transit Rule methods. Options 5, 6, 7 and 8 should be used on figures that are closed, while options 9, 10, 11 and 12 should be used solely on open figures (traverses).

Altering the Map Display

During the course of parcel course entry it may be necessary to change the map display by: (a) panning or (b) zooming in or out of the current view. The bottom three fields of the parcel course data entry dialog box, see Figure 7, can be used to accomplish either of these tasks. Once the view has been altered, the dialog box

reappears and the parcel course data entry process can continue.

Note that if any values, other than the default values for the bottom three data fields, appear in these fields, the map display will be altered accordingly. That is to say, the panning and zooming parameters take precedence over the parcel course parameters.

Example

As an example let us consider the parcel shown in Figure 11. As can be seen, the parcel is comprised of both line and curve features. Using typical COGO functionality, the user could use two or three different commands to establish the features shown in Figure 11. Using the Create a Parcel tool, however, we will use a single tool to create all of the features shown in the sample parcel.

In getting started, we will assume that the user has an established point somewhere in the map. As such, invoke

ArcMap or ArcView and either load an existing point theme or create a new point feature at some arbitrary location.

Once this is done, display the Create a Parcel tool by either: (a) activating the CEDRA-AVparcel-Tools toolbar (ArcGIS users) or (b) activating the CEDRA-AVparcel extension (ArcView GIS users).

At this point we are ready to begin the deed transcribing process. We assume that the low left corner of the sample parcel shown in Figure 11 is the starting point (POB), so that:

1. Select the Create a Parcel tool.
2. Make a pick at the existing point feature.

At this point, the choice list message box of Figure 3 is displayed.

3. Select the "Pick POB & Transcribe Deed" option, and then click at the OK button.

At this point, the command will query the user for confirmation of the feature selection.

4. Click at the Yes button to confirm the selection of the feature.

The command will now prompt for the parcel PIN. Depending upon which parcel PIN format is currently active, the user will see either Figure 5, or 6, or some variation of Figure 5.

5. Enter any desired PIN, and then click at the OK button.

At this point, the parcel course data entry dialog box of Figure 7 will appear.

We will now begin to enter the various parcel course data using the A and C codes. Code A will establish the lines, while code C will establish the tangent curves. In defining the curves, we will enter the radius and arc length for each of the curves.

6. Enter:
NE 0 in data field 1 - Direction
200 in data field 2 - Distance
Click at the OK button.

7. Enter:
NE 90 in data field 1 - Direction
400 in data field 2 - Distance
Click at the OK button.

8. Enter:
0 in data field 2 - Distance
-200 in data field 4 - Arc Radius
300 in data field 5 - Arc Length
Click at the OK button.

9. Enter:
200 in data field 4 - Arc Radius
200 in data field 5 - Arc Length
Pick the OK button.

10. Enter:
NE 61 21 8 in data field 1 - Direction
225 in data field 2 - Distance
Click at the OK button.

11. Enter:
NE 90 in data field 1 - Direction
175 in data field 2 - Distance
Click at the OK button.

12. Enter:
SE 0 in data field 1 - Direction
475 in data field 2 - Distance
Click at the OK button.

13. Enter:
SW 45 in data field 1 - Direction
254.69 in data field 2 - Distance
Click at the OK button.

At this point we have one last course to enter to terminate the parcel. One possibility is to use the command's capability to force close the parcel by adding a course. As such we could:

14. Enter:
y in data field 8 - Point of Beginning
Click at the OK button.

At this point, the parcel termination choice list of Figure 9 will appear.

15. Select the option:
"Force Closure - Add a Course",
Click at the OK button.

At this point, the parcel confirmation query box of Figure 8 will appear.

16. Click at the Yes button to confirm the parcel definition.

At this point a polygon feature or an AVparcel parcel feature will be created. Depending upon how the user responded to the "Create Topology" parameter in Figures 5 or 6, the user can control which type of feature is created. A response of NO for this parameter will result in the creation of a polygon feature, while a response of YES will create an AVparcel parcel feature.

As an alternative to Steps 14 through 16, described above, we can enter the

last course explicitly. However, in doing so, we will enter a course that will cause the parcel not to close. Graphically, the parcel will look closed but the end point of the last course and the start point of the first course will not be the same. So that, instead of 895.48, we will enter 896 as the length of the last course. Thus, after repeating Steps 1 through 13 above, we will continue with the steps below, rather than performing the above Steps 14 through 16.

14. Enter:
NE 90 in data field 1 - Direction,
-896 in data field 2 - Distance,
Click at the OK button.

At this point, the parcel course data entry dialog box will reappear. Graphically, the parcel looks closed. However, the length of 896 that we entered is larger than the length of 895.48, which creates a closed polygon.

What we want to do now at this point is to close the parcel using a Least Squares adjustment. As such:

15. Enter:
y in data field 8 - Point of Beginning
Click at the OK button.

At this point, the parcel termination choice list of Figure 9 will appear.

16. Select the option:
"Adjust using Least Squares",
Click at the OK button.

At this point, the parcel adjustment dialog box of Figure 12 will appear.

17. Click at the OK button to confirm the default name of the report file and closing angle shown in the two data fields of this dialog box. A dis-

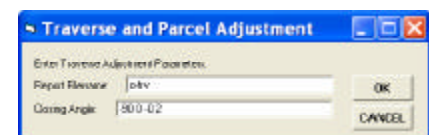


Figure 12
Parcel Adjustment Dialog Box

cussion regarding these two data fields is presented later on in this bulletin.

The command will now begin the adjustment, after which a polygon or AVparcel parcel feature will be created. The reader is referred to the commentary presented above following the first Step 16 instructions.

With reference to the two data fields of the dialog box of Figure 12, note the following:

- (a) In order to perform an adjustment within ArcMap, it is required that the document file be assigned a name. An adjustment can not be performed in an 'Untitled' document file.
- (b) When a parcel is adjusted, within the polygon theme (layer), the command will introduce, if they are not present, six fields called: CLOSED, CLOSE_DIST, CLOSE_DX, CLOSE_DY, CLOSE_AZ and CLOSE_BEAR.

The domain of the CLOSED attribute will be either YES or NO, with:

- YES indicating that the data entered in defining all of the parcel courses resulted in a closed figure.
- NO indicating that the said data did not create a closed figure, and that an adjustment had to be performed in order to close the parcel.

The other five attributes identified above contain information pertaining to the error of closure from the last course endpoint towards the first point (POB) of the parcel.

- (c) For a polygonal parcel, or for a closed traverse, the user should just accept whatever default value is presented in this data field. However, in the case of an open traverse,

the user will be presented with a dialog box similar to the one shown in Figure 13.



Figure 13
Open Traverse Adjustment Dialog Box

As can be seen from Figure 13, the open traverse case requires more information in performing an adjustment than the closed figure case. Specifically the user will need to specify the following:

1. The Traverse Starting Azimuth
2. The Traverse Ending Azimuth
3. The Closing Angle
4. The Traverse End Point.

The Utility 1 [TRANSFORM] tool can be used to define the above information if the user is not able to explicitly enter this data. If this is the case, the user will need to use the Utility 1 tool prior to performing the open traverse adjustment. To do so, the user should activate the Utility 1 tool and select the:

Pick Open Traverse Start Azimuth Mark option to specify the traverse starting azimuth. This is the direction from the second point in the traverse to the traverse's start point.

Once the option has been selected, the user can make the appropriate picks in the map. That is, the user should first select the second point in the traverse followed by picking the start point of the traverse.

Upon completion, the Utility 1 tool can be re-selected and the:

Pick Open Traverse End Azimuth Mark option selected to specify the traverse ending azimuth. This is the direction from the second to last point in the traverse to the traverse's known end point. This point is not the current end

point of the traverse, but rather, the point where the current end point should be.

Once the option has been selected, the user can make the appropriate picks in the map. That is, the user should first select the second to last point in the traverse followed by picking the point where the current end point of the traverse should be.

Upon completion, the Utility 1 tool can be re-selected and the:

Pick Open Traverse End Point option to specify the traverse end point. This is the point where the current end point of the traverse should be.

Once this information has been specified, the user is able to perform an open traverse adjustment. Note, when the user employs this approach the Closing Angle parameter shown in Figure 13 should be specified as zero.

Tie Lines

In many deeds, the parcel description does not begin at a parcel corner, but it commences at some other known point, or monument. This is the deed's point of commencement (POC). From this point, the deed description traverses to the parcel's point of beginning (POB), and then begins the parcel's boundary description. The traverse or string from the point of commencement (POC) to the point of beginning (POB) is referred to as a tie line.

The process of transcribing a deed that contains a tie line to the POB, is quite the same as that described above. For example, consider the simplistic parcel of Figure 14. Shown in Figure 14 is a rectangular parcel with a tie-line, which

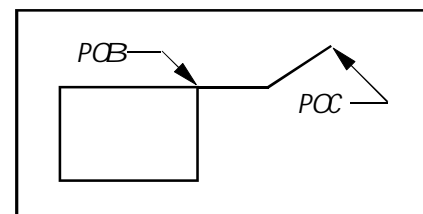


Figure 14 - Parcel And Tie Line

is comprised of two courses. To establish this parcel the following steps could be performed:

1. Carry out Steps 1 and 2 above, but in Step 2 click at the POC point rather than at the POB.
2. In Step 3 above select the “*Pick POC & Transcribe Deed*” option, and then click at the OK button.
3. Transcribe the tie line courses following the same methodology described in Steps 4 through 13 above.
4. Enter:
y in data field 8 - Point of Beginning
Click at the OK button.

As always should there be any questions in how to use the Create a Parcel tool, or recommendations in additional functionality that would be desirable, please let us know.

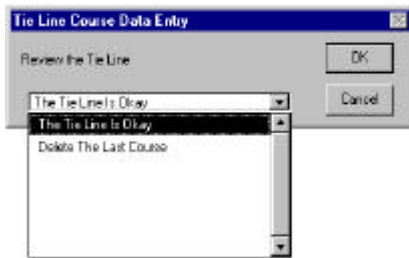


Figure 15 Tie-Line End Specified

At this point, the tie-line termination choice list of Figure 15 will appear since the “*Pick POC & Transcribe Deed*” option was selected above in Step 3.

5. Select the “*The Tie Line Is Okay*” option, and then click at the OK button.

At this point, the definition of the tie line has been completed and the user is now able to begin the parcel transcription process.

Summary

For those users who are involved in transcribing deed data, the Create a Parcel tool provides a single user-interface for creating line, curve or polygon features, representing parcels or open traverses. This tool is an excellent alternative to using multiple individual COGO tools.

If you have a request for Command Of The Month, feel free to phone, fax or e-mail your request to The CEDRA Corporation.