

The CEDRA Corporation's COMMAND OF THE MONTH

A monthly information bulletin

March 2009

FEATURED COMMAND

Annotating Distances for
Polylines and Polygons



Application Description

We recently came across an application where a user wished to annotate distances for the sides within a polygon. Many of our users are probably aware of the [Annotate Distance] command within the {Annotation} combo-box of the CEDRA-AVcad-Menus toolbar, see Figure 1.

This command enables the user to create annotation features which represent the distances for the sides comprising polylines and/or polygons. As such, this command seems like a perfect solution for this application.

To give the reader a little background regarding this command, when processing polylines this command will annotate the distance or length for each segment comprising the polyline.

When processing polygons, the command will try to determine which courses (segments) in the polygon form a curve. In so doing, the command does not annotate every segment comprising the polygon.

For polygons where curves are drawn in a mathematical manner, that is, the segments comprising the curve are of equal length and central angle, the [Annotate Distance] command works well. However, when the curves are not drawn in this manner, the [Annotate Distance] command ends up annotating pretty much every segment in the polygon.

When polygons are created by digitization, it is very difficult if not impossible

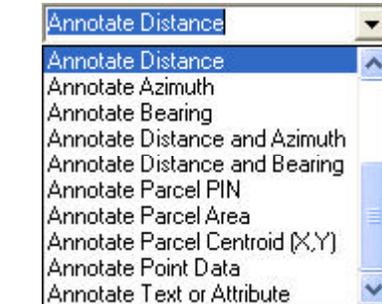


Figure 1
{Annotation} Combo-Box

for the operator to mathematically digitize a curve. In addition, some operators will introduce intermediate vertices on a course that should actually be comprised of only a start point and an end point. The question then becomes how do we work around these issues.

Command Of The Month bulletin

This month's issue discusses the available tools for annotating distances for polyline and strings within polygon features.

The CEDRA Solution

To address the application described above, it was necessary for us to introduce additional functionality. Specifically, we needed to: (a) give the user more control in how the distance annotation was created and (b) add a new tool for annotating a polyline's or portion of a polygon's length.

In giving the user greater control over how the annotation is created, the

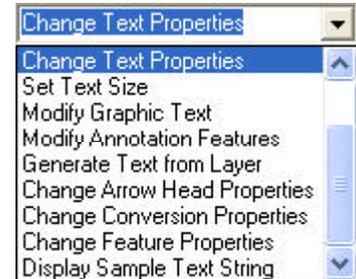


Figure 2
{Text Properties} Combo-Box



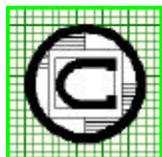
Figure 3
CEDRA-Text-Tools Toolbar

[Change Text Properties] command within the {Text Properties} combo-box was modified, see Figure 2.

The new annotation tool, **Annotate Polyline Length**,  was added to the CEDRA-Text-Tools toolbar, see Figure 3. This tool will process both polyline and polygon features.

Once the above enhancements were implemented, the process for creating the distance annotation for polygon features becomes as follows:

1. Define the appropriate text parameters to:
 - (a) create the desired annotation features in terms of size and offset of the annotation from a polygon side, and
 - (b) reduce the number of inappropriate annotation features.



The CEDRA Corporation

Total CADD for Engineers™
Bridging Engineering and GIS™

Phone: 585-232-6998
Fax: 585-262-2042

151 Sully's Trail - Suite 6
Pittsford, New York 14534

E-mail: cedra@cedra.com
URL: <http://www.cedra.com>

Copyright © 2009 The CEDRA Corporation. The CEDRA logos, CEDRA-AVseries, CEDRA-AVcad, CEDRA-AVcogo, CEDRA-AVparcel, CEDRA-AVland, CEDRA-AVsand, CEDRA-AVwater, CEDRA-DataEditor and CEDRA-DxfExport are trademarks of The CEDRA Corporation. ArcView® GIS, and ArcGIS are registered trademarks of Environmental Systems Research Institute, Inc. All World Rights Reserved.

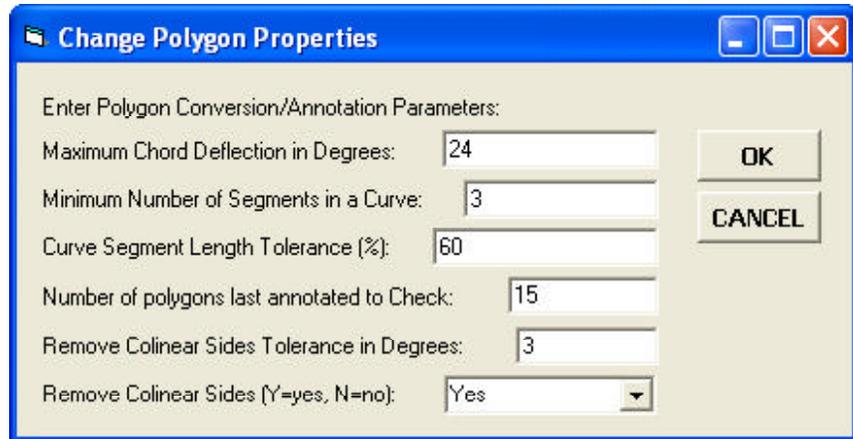
The [Change Text Properties] and the [Change Conversion Properties] commands can be used to accomplish this.

Specifically, this includes the following parameters:

- ▶ Text Size
- ▶ Annotation Offset
- ▶ Digits Right of Decimal - Distance
- ▶ Include Curve Prefix Label
- ▶ Minimum Segment Length for Annotation, and
- ▶ For Curves, Distance Annotation is the

within the [Change Text Properties] command, see Figure 4 and the:

- ▶ Remove Colinear Sides Tolerance in Degrees, and
- ▶ Remove Colinear Sides



The dialog box titled "Change Polygon Properties" contains the following fields and controls:

- Enter Polygon Conversion/Annotation Parameters:
- Maximum Chord Deflection in Degrees: 24
- Minimum Number of Segments in a Curve: 3
- Curve Segment Length Tolerance (%): 60
- Number of polygons last annotated to Check: 15
- Remove Colinear Sides Tolerance in Degrees: 3
- Remove Colinear Sides (Y=yes, N=no): Yes
- Buttons: OK, CANCEL

Figure 5
Change Conversion Properties Multi-Input Dialog Box

parameters within the [Change Conversion Properties] command, see Figure 5.

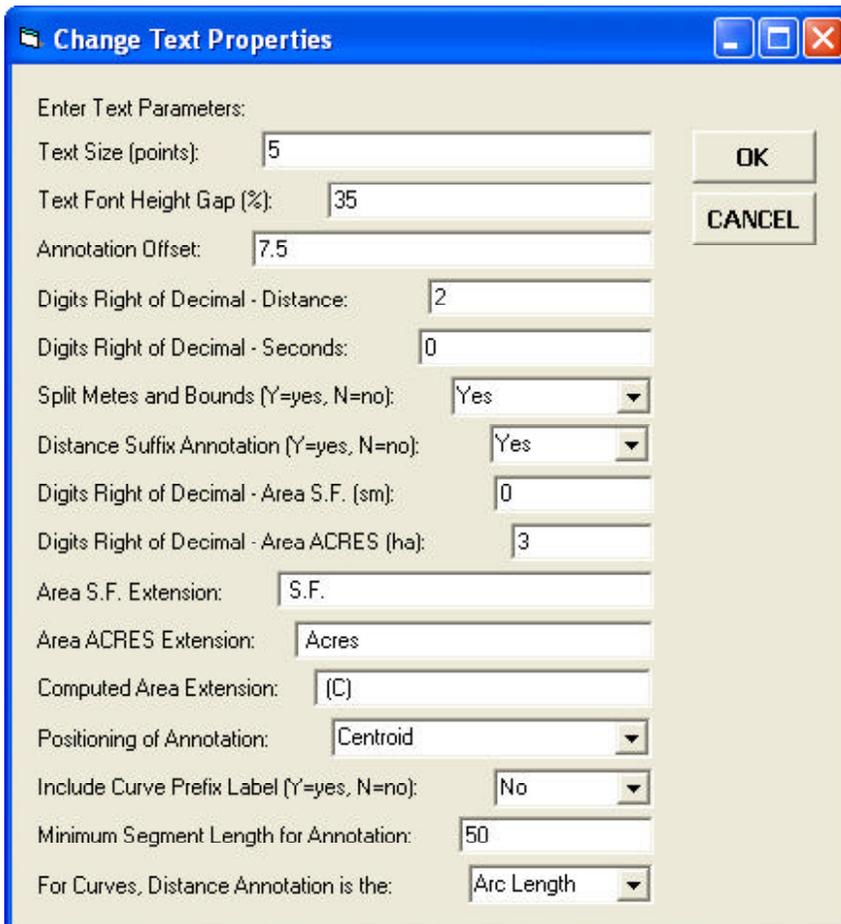
2. Select the [Set Working Directory] command to define the current

working directory. If a new layer is to be created to contain the new annotation features, this command enables the user to control the default folder where the new personal geodatabase will be stored.

3. Select the [Set Active Layer] command to define the layer where the new annotation features are to be stored.
4. Select the polygons to be processed.
5. Select the [Annotate Distance] command to generate the bulk of the distance annotation.
6. Delete any undesired or inappropriate distance annotation.
7. Use the **Annotate Polyline Length** tool to create any missing annotation.

Note that the user can also employ any of the other properties within the [Change Text Properties] and [Change Conversion Properties] commands, if so desired.

In defining the [Change Text Properties] properties, the values shown in Figure 4 can be used as initial values. Once the annotation is created, the user has the option of Undoing the annotation, at which point the values in Figure 4



The dialog box titled "Change Text Properties" contains the following fields and controls:

- Enter Text Parameters:
- Text Size (points): 5
- Text Font Height Gap (%): 35
- Annotation Offset: 7.5
- Digits Right of Decimal - Distance: 2
- Digits Right of Decimal - Seconds: 0
- Split Metes and Bounds (Y=yes, N=no): Yes
- Distance Suffix Annotation (Y=yes, N=no): Yes
- Digits Right of Decimal - Area S.F. (sm): 0
- Digits Right of Decimal - Area ACRES (ha): 3
- Area S.F. Extension: S.F.
- Area ACRES Extension: Acres
- Computed Area Extension: (C)
- Positioning of Annotation: Centroid
- Include Curve Prefix Label (Y=yes, N=no): No
- Minimum Segment Length for Annotation: 50
- For Curves, Distance Annotation is the: Arc Length
- Buttons: OK, CANCEL

Figure 4
Change Conversion Properties Multi-Input Dialog Box

can be modified accordingly and the annotation regenerated.

Regarding the [Change Conversion Properties] properties, again, the values shown in Figure 5 can be used as initial values. Should the annotation that is created not be satisfactory, Undo the annotation, modify the values and then recreate the annotation.

For more information regarding the [Change Text Properties] command, as well as, the [Set Active Layer] command, the reader is referred to the May 2005 issue of Command of the Month.

The remainder of this month's issue will focus on the operation of the new annotation tool that was added. The reader is referred to the Notes section, at the end of this publication, for more information regarding the new text parameters that have recently been added (the bottom 3 parameters of Figure 4).

Annotate Polyline Length Tool - Overview

With the **Annotate Polyline Length** tool, , the user is able to select a polyline or polygon feature and have the length of a string within the feature annotated.

If the polyline that is selected does not form a closed figure, a single annotation feature is created representing the entire length of the polyline.

If the polyline does form a closed string, it is treated as if a polygon feature was selected.

In this case, the user is prompted to make three picks which are used to define a string within the feature. Using this string, a single annotation feature is created which represents the length of the string.

The tool will determine which vertex within the polyline or polygon feature is closest to each of the individual picks. These vertices will determine the string that will be annotated. The picks can be

made in either a clockwise or counter-clockwise direction. The first pick denotes the start point of the string, the second denotes a point along the string, while the third pick denotes the end point of the string.

Once the string has been defined, the annotation is generated, at which point, the user has the ability to reposition the annotation in a manner identical to that of the Curved Text,  tool.

That is to say, the annotation will be initially positioned centered along the string, following the curvature of the string. The user, in an interactive manner, can then reposition the annotation.

Annotate Polyline Length Tool - Operation

To use the **Annotate Polyline Length** tool, , the user should:

- **1** Click at the **Annotate Polyline Length** tool  at which point a message in the status bar area will appear prompting the user to select a polyline or polygon feature.
- **2** Click in the ArcMap display at an existing polyline or polygon feature.

If the click is made at a place where there is no feature, the program beeps, and informs the user in the status bar to select a polyline or polygon. In this case repeat Step 2; otherwise, the conventional feature confirmation box is displayed, see Figure 6.

- **3** **Confirm, or not** the selection by selecting the appropriate button, see Figure 6.

Having confirmed the selection, by selecting the Yes button, the tool checks to see if the feature that is selected forms a closed figure.

In the case of a polygon, a closed figure is selected by definition. In the case of a polyline, if the start and end points of the polyline are identical, a closed figure is selected.

If a closed figure is not selected, that is, the start and end points of the selected feature are not identical proceed to Step 5

If a closed figure is selected, the user is prompted to make three picks to define the string within the selected feature that is to be processed. In this case:

- **4** **Make** three picks to define the string:
- **5** Once the feature or string to be processed has been identified, the multi-input dialog box of Figure 7 is displayed, in addition to the annotation feature.

If a closed figure has been selected, the tool will also display a red polyline indicating the string for which the length was computed.

Beginning at the top of the multi-input dialog box:

Enter in the *X offset value*: data field any value other than the displayed default value to move the text in a forward or backward direction along the string using the default value as a guide, or **accept** the default value.



Figure 6
Feature Confirmation Query

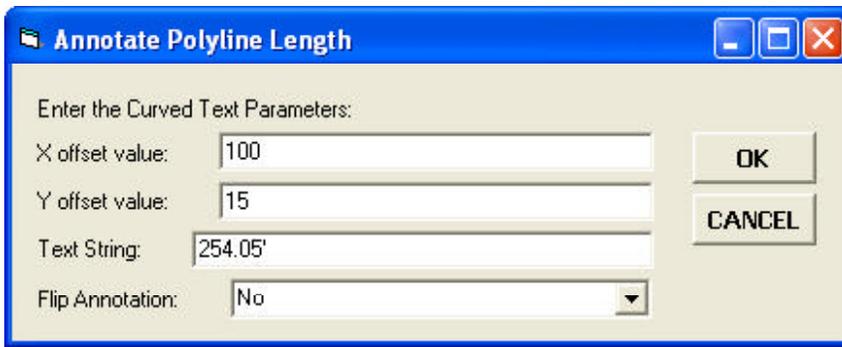


Figure 7
Annotation Positioning Multi-Input Dialog Box

- **6 Enter** in the *Y offset value:* data field any value other than the displayed default value to move the text in a further away or closer to the string using the default value as a guide, or **accept** the default value.

Regarding the *Y offset value:* data field, note the following:

- The last used value of this offset is remembered from operation to operation within a program session.

- A positive value moves the text string to the right and a negative to the left depending upon the direction in which the string has been developed.

- **7 Edit** any portion of the default text string in the *Text String:* data field, if so desired. The default value will be the length of the string, which is computed by summing the length's of each of the individual segments comprising the string

- **8 Scroll** down in the *Flip Annotation:* choice list data field, and select the
- **No** option to maintain the text orientation.
 - **Yes** option to reverse the orientation of the text, see Figures 8(a) and 8(b).

- **9 Click** at the **OK** button for the program to apply the above en-

tered specifications, or **click** at the **Cancel** button to accept the last displayed text orientation.

Regarding the above step, note the following:

- Clicking at the **OK** button does not close the dialog window. Such a click applies the last specified curved text specifications, and provides the user the opportunity to modify said specifications.

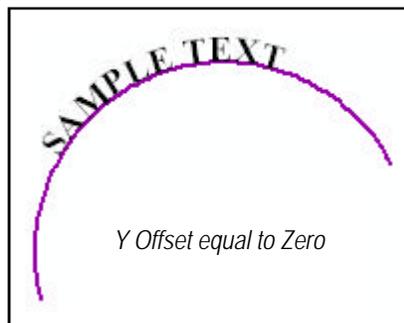


Figure 8(a)
Initial Orientation of Text

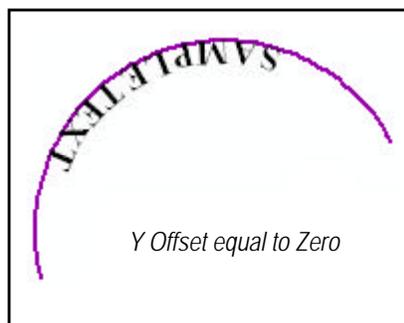


Figure 8(b)
Flipped Text String

- To close the dialog window the user must click the **Cancel** button.

- In order for the latest entered curved text specifications to take effect, the **OK** button must have been clicked at least once.

Having clicked at the *Cancel* button the text string is positioned, and the command remains active to repeat from Step 2 above.

The command remains active to repeat from the beginning. In so doing, the data last entered is remembered and used as the default display.

Shown in Figure 9(a) is a polyline which does not form a closed figure. In this case the length of the polyline is computed and displayed immediately upon confirmation of the selected feature. Note that only one annotation feature is created, that is to say, there will not be an annotation for every segment comprising the polyline.

Figure 9(b) illustrates a closed polyline or polygon, which requires the definition of three picks to define the string that is to be annotated, as per Step 4.

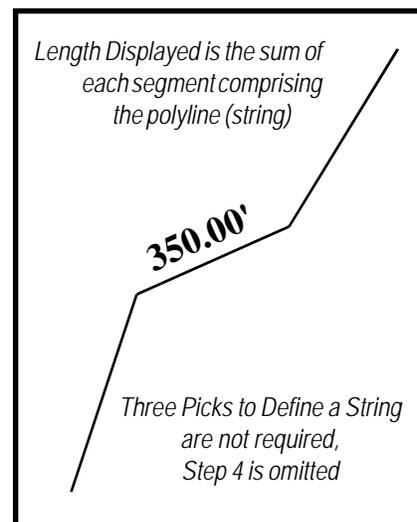


Figure 9(a)
Sample Non-closed Figure
of a Polyline Feature

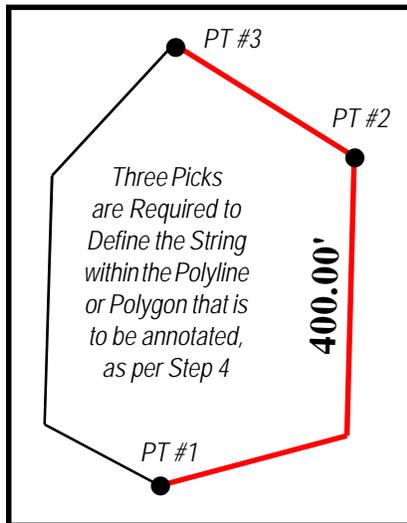


Figure 9(b)
Sample Closed Figure
of a Polyline Feature

In both cases, 9(a) and 9(b), the default length value displayed is the sum of each segment length comprising the string. Should the user wish to override this value, the desired text can be entered in Step 7.

Notes:

1. If a two-point line segment within a polyline or polygon is to be processed, the picks made to identify the second and third points, PT #2 and PT #3 in Figure 9(b), should be the same. That is to say, if the second and third picks identify the same vertex in the selected feature, the tool will assume that a two-point line segment is to be processed, see Figure 10.
2. The *Include Curve Prefix Label* (Y=yes, N=no): data field enables the user control whether the curve prefix is to be included or not. Selecting the **y** option indicates that the labels R= and L= are to be included when annotating a curve's radius and/or arc length (i.e. R=350.0' or L=179.50'). Selecting the **n** option indicates that the prefixes are not to be included.
3. The *Minimum Segment Length for Annotation*: data field enables the

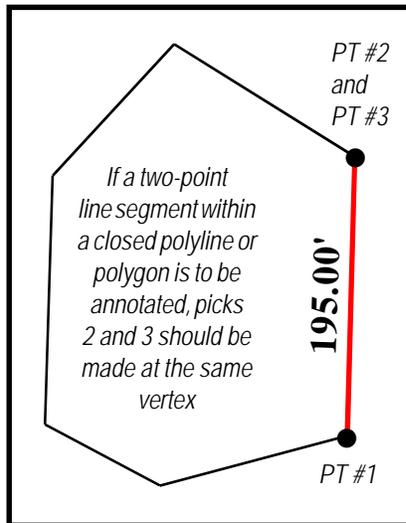


Figure 10
Two-Point Line Segment
being Annotated

user to specify the minimum segment length in which a distance or arc length should be annotated. For example, if the user specifies 50 for this parameter, any line or curve whose distance or arc length is less than 50 will not be annotated. Any line or curve whose distance is 50 or greater will have an annotation created. This parameter is very helpful in eliminating annotation for segments that should not be annotated.

4. The *For Curves, Distance Annotation is*: data field enables the user to control which curve attribute is to be annotated when using the {Annotate}[Annotate Distance], [Annotate Azimuth] or [Annotate Bearing] commands. Selecting the **Radius** option indicates that the radius and not the arc length should be annotated, while selecting the **Arc Length** option indicates that the arc length and not the radius should be annotated.
5. The *Remove Colinear Sides Tolerance in Degrees*: and *Remove Colinear Sides* (Y=yes, N=no): data fields enables the user to control how courses, which have approximately the same direction, should be handled. As mentioned at the

beginning of this publication, some operators will introduce intermediate vertices for courses which should be comprised of only a start point and end point. Using these parameters, the user is able to remove these intermediate vertices to form a single two-point course, see Figure 11.

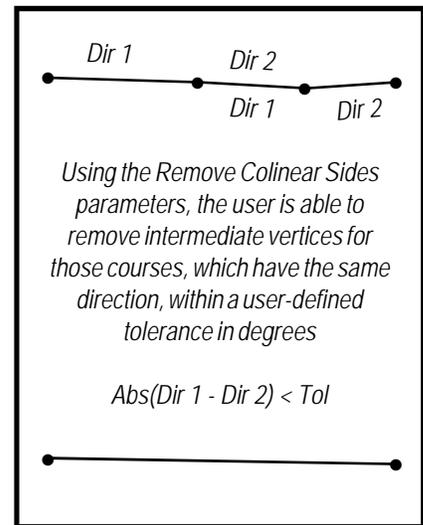


Figure 11
Remove Colinear Sides
Example

6. Shown in Figure 12 is an example of how the Annotate Polyline Length tool can be used in conjunction with the [Annotate Distance] and [Annotate Parcel Area] tools to produce a fully annotated tax map. In this figure the bulk of the distance annotations were created using the [Annotate Distance] command. The area annotation was created using the [Annotate Parcel Area] tool. The three courses on the left side of the figure were processed using the Annotate Polyline Length tool. Although it may not be apparent from the figure, the three courses are comprised of multiple small courses. By using the *Minimum Segment Length for Annotation*: parameter, we are able to set a minimum length that eliminates the annotations for these small segments. We then use the Annotate Polyline Length tool to create the annotation for these courses.

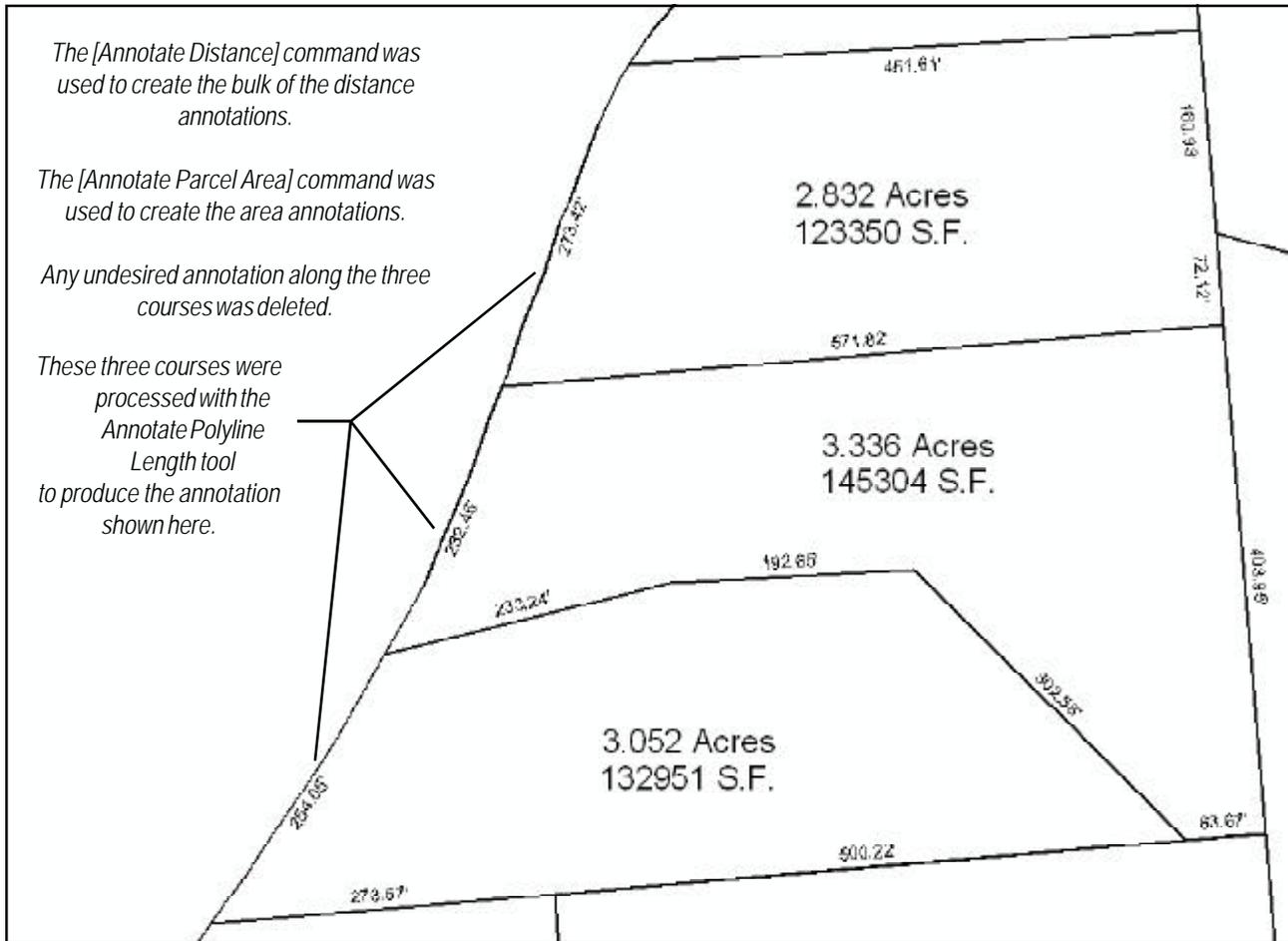


Figure 12 - Example of the application of the Annotate Polyline Length Tool

Summary

Users who are involved in generating annotation, such as those who produce tax maps, will find the recent enhancements made to the software very helpful.

Users with a software support agreement should check with The CEDRA Corporation on how to obtain a software update so as to be able to utilize this new functionality.

As always, should the reader have any suggestions on functionality that should be featured in Command of the Month, please feel free to forward them on to us.

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