

The CEDRA Corporation's COMMAND OF THE MONTH

A monthly information bulletin

November 2009

FEATURED COMMAND
Find Lines
Connected to Points



Application Description

Recently an application arose where it was necessary to change the value of an attribute of a point feature based upon a common attribute value of the lines connected to the point. That is to say, if the attribute value for all of the lines connected to a point were the same, then assign to the point a specific attribute value.

In this particular case, the point features represent manholes, while the line features denote the pipes coming into and out of the manhole. Using the status attribute of the pipe, it was desired to change the status attribute of the manhole. Specifically, if all of the pipes connected to the manhole were flagged as being abandoned, it was desired to set the status of the manhole to be abandoned as well.

While this month's issue of Command of the Month addresses this application, the methodology described below can be applied to other applications where line connectivity needs to be ascertained.

The CEDRA Solution

To address this issue, the [Lines Connected to Points] command was added to the {Skeletonize Tools} menu combo box, which is within the CEDRA-Skeletonization-Tools toolbar as shown in Figure 1. Note that this is a new command that has been added to the combo box within the last month, as a matter of fact, within the last two weeks.

Scrolling down in the {Skeletonize Tools} menu combo box, the [Lines Connected to Points] menu command is the second from the last command in the scroll down list (see Figure 1).

Command Overview

Using the [Lines Connected to Points] command, the user is able to:

- determine the line features that are connected to one or more points,
- assign to the point feature an attribute value based upon a common attribute value of the connecting lines, and optionally

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This month's issue discusses the process of finding point features which are "close" to each end point of one or more line features.

- generate a report containing for each point feature processed: (a) the line(s) that were found to be connected to the point and (b) the attribute value, if any, that was assigned to the point.

In using this command, the user is able to specify a proximity tolerance value that is used to determine "connectivity" of a line feature to a point.

The points and lines that are processed by this command can reside in more than



Figure 1
CEDRA-Skeletonization-Tools Toolbar
for ArcGIS Users

one layer. That is to say, the user can process, in a single session, points from several different layers and lines from another group of layers.

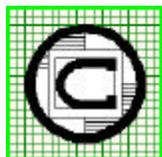
The point and line features that are examined are taken from the active layers at the time the command is invoked.

Command Operation

- 1 Activate** the various point and line layers to be processed.
- 2 Select** the point features to be processed. If all of the features in a point layer are to be processed, the points in that layer do not need to be selected.
- 3 Scroll** down in the {Skeletonize Tools} menu combo box, and se-



Figure 2
No Selected Point and Line Layer Error
Message



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Figure 3

No Selected Line Layer Error Message



Figure 4

No Selected Point Layer Error Message

lect the [Lines Connected to Points] command.

If there are no active point and line layers at the time the command is activated, or if only one of the two required layer types is active, one of the three error message shown in Figures 2 through 4 will be displayed.

At this point, click the OK button, activate the appropriate layer(s) and re-select the command.

- 4 **Enter** the appropriate information for the various parameters shown in Figure 5.

Figure 5

Lines Connected to Points Parameters

In specifying the information requested by the parameters shown in Figure 5, the user should note the following:

- The *Features to Process* parameter enables the user to specify whether: (a) all of the point features in the active layers are to be processed, or (b) only the selected point features are to be processed. If the user selects the Selected Features option and there are no selected features, no error message will be displayed. The command will simply proceed to the next active point layer for processing.
- The *Mode of Operation* parameter enables the user to specify whether the command is to: (a) simply assign the attribute value, the Transfer Only option, (b) generate a report without modifying the point features, the Report Only option, or (c) assign the attribute value and generate a report, the Transfer and Report option.
- The *Point ID Field* parameter is used when the report is generated. The value of this attribute will appear in the report and is used to identify the point that was processed.

The *Point Attribute Field to Modify* parameter denotes the attribute in the active point layers that is to be assigned a value.

- The *Point Attribute Field Value* parameter denotes the value that is to be assigned to the field specified in the previous parameter.

Note, if the value specified in this pa-

rameter matches the name of a field in any of the active line layers, the command will use the value of the field when modifying the point. For example, if the user enters A and one the active line layers has a field called A, the command will not assign A to the point, but rather, will assign the value of the A field to the point.

- The *Line ID Field* parameter is used when the report is generated. The value of this attribute will appear in the report and is used to identify the line that is connected to a point.
- The *Line Attribute Field to Check* parameter denotes the attribute that the command is to check.
- The *Line Attribute Field Common Value* parameter denotes the common value that is to be checked for. If all of the lines that are connected to a point have this value assigned to them, then the point is assigned the value entered in the *Point Attribute Field Value* parameter.
- The *Proximity Tolerance* parameter denotes the distance in world units that a line is to be considered as being “connected” to a point.

- The *Report Filename* parameter denotes the name of an ASCII based file that will contain the results of the processing.

The file icon to the right of the data field enables the user to display a typical file browsing dialog box from which the user can select an existing file or enter the name of a new file in a particular folder.

- The *Report Format* parameter enables the user to control the type of report that should be cre-

ated. The Short option indicates that the command should output only those point features that were modified, while the Full option indicates that the command should output all point features that were processed, regardless if the point was modified or not.

- **5** Click at the **OK** button to begin the processing,
or
click at the **Cancel** button to abort the command.

If the OK button is selected, the command checks if the specified report filename exists. If it does not, the command begins its calculations.

If the report file exists, the command displays a Yes/No/Cancel message box querying the user as to how the existing file is to be handled. Selecting the Cancel button aborts the command. Selecting the No button results in the existing file being appended. Note that the new results are added at the bottom of the existing file. Selecting the Yes button results in the existing file being overwritten.

In performing its calculations, the command processes either all of the point features in the layer, or only the selected point features as indicated by the setting of the *Features to Process* parameter. If there are no selected point features in a point layer and the user has indicated that only selected features are to be processed, then the point layer is skipped and the next active point layer is processed.

During the processing, the command determines the coordinates of a point. The command then performs a spatial search for all line features that fall within the proximity tolerance to the point.

If there are no line features that fall within the proximity tolerance to the point's coordinates, a message to this effect will appear in the report file. Likewise, if there are one or more line features that fall within the proximity tolerance, a message to this effect will appear in the report file.

Additionally, the report will contain for each connecting line, the

line's layer and ID values. The *Line ID Field* parameter is used to extract the ID value.

As the command performs its calculations, a progress bar such as that shown in Figure 6 will be displayed. Clicking the Cancel button will abort the command.

Once the command has completed its processing, an information message box similar to that shown in Figure 7 will be displayed. The data shown in this

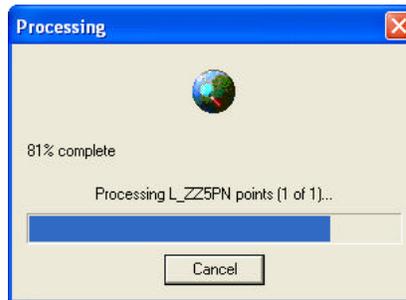


Figure 6
Progress Bar Display

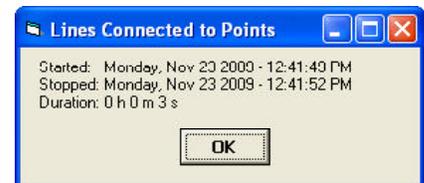


Figure 7
Command Completion Message Box

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Summary of Results for the analysis of:
Lines Connected to Points

Point Field to be Modified: ASSET_TYPE
Line Field to be Checked: ASSET_TYPE
Line Field Common Attribute Value: ABND.MAN

Mode of Operation: Transfer and Report

Proximity Tolerance: 0.010000

Processed 32 Points, Modified 24

Started: Monday, Nov 23 2009 - 12:43:37 PM
Stopped: Monday, Nov 23 2009 - 12:43:38 PM
Duration: 0 h 0 m 1 s

1: L_TestPN : FID = 4 no lines close to the point
2: L_TestPN : FID = 5 no lines close to the point
3: L_TestPN : FID = 6 no lines close to the point
4: L_TestPN : FID = 7 no lines close to the point
5: L_TestPN : FID = 8 no lines close to the point
6: L_TestPN : FID = 9 no lines close to the point
7: L_TestPN : FID = 18 no lines close to the point
8: L_TestPN : FID = 31 no lines close to the point
9: L_TestPN : FID = 0 1 line close to the point
10: L_TestPL, FID = 0
11: Stored : ABND.MH
12: L_TestPN : FID = 1 1 line close to the point
13: L_TestPL, FID = 1
14: Stored : ABND.MH

```

Figure 8
Sample Report File created by the [Lines Connected to Points] command

message box denotes the time it took to perform the processing.

Presented in Figure 8 is a sample report file illustrating the syntax of the messages that can appear in the file. The Full option was used in creating this report file. Under the Short option, the point features whose FID values are 4 though 9, 18 and 31 would not appear in the file.

Note that at the top of the report, the command identifies the values of the:

Point Attribute Field to Modify, the *Line Attribute Field to Check* and the *Line Attribute Field Common Value*

parameters. Additionally, the report will contain the total number of points that were processed, as well as, the number of points that were modified.

Below this information, the report will contain a list of the points that were processed and the results of the processing. The attribute value of the *Point ID Field* parameter will be used to identify the point.

If no lines were found to be “connected” to the point, a message to this effect will appear. Under the Short report format, this information will not appear.

If lines were determined to be “connected” to the point, a list of those lines will appear along with the value that was assigned to the point (denoted by the Stored : label). Under the Short report format, this information appears only if the point feature is modified.

Summary

The [Lines Connected to Points] command is a useful tool for determining connectivity of lines to points. Should users wish a variation of this command, they should feel free to contact The CEDRA Corporation and make a request.

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, users who have a need for functionality that is not presently available in CEDRA software should feel free to forward these requests to CEDRA, as well as, any other comments or suggestion you may have.

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