ArcScan Tutorial

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Exercise 1: Interactive vectorization

ArcScan makes it easy to create new features from scanned raster images. This process can significantly reduce the time it takes you to incorporate raster data into your vector database.

In this exercise, you will generate features from a scanned parcel map by interactively tracing raster cells. You will begin by starting ArcMap and loading a map document that contains the raster dataset and two layers.
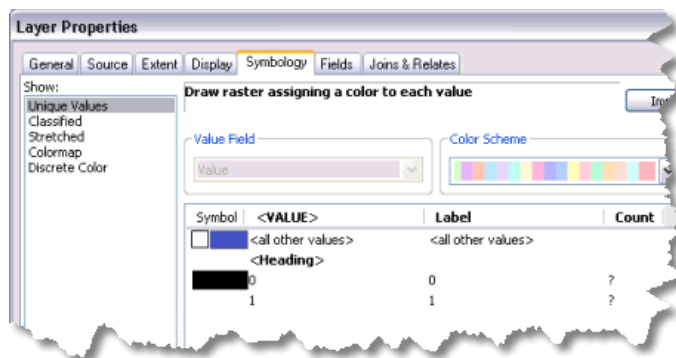
Setting up the ArcScan environment

Prerequisite:
You need to have the ArcScan for ArcGIS extension installed and registered. In addition, start ArcMap and add the Editor and ArcScan toolbars to the display.

Steps:

1. Click the **Open** button 📂 on the *Standard* toolbar.

2. Navigate to the **ArcScanTrace.mxd** map document in the ArcScan directory where you installed the tutorial data and select it (C:\ArcGIS\ArcTutor is the default location).

3. Click **Open**.

4. To use ArcScan, you need to enable the extension. Click the **Customize** menu, click **Extensions**, check **ArcScan**, then click **Close**.

5. Raster layers must be symbolized as two-color images to use the ArcScan tools and commands. You will change the raster symbology from stretched to unique values. Right-click the **ParcelScan.img** raster layer in the ArcMap table of contents and click **Properties**. The *Layer Properties* dialog box appears.

6. Click the *Symbology* tab on the *Layer Properties* dialog box.

7. Click **Unique Values** in the **Show** box.

8. Click **OK**.

Setting the raster snapping environment

ArcScan is designed to work in conjunction with the ArcMap editing environment and is only active when an edit session has been started. You need to set some options for snapping while editing and using ArcScan.

Steps:

1. Click the **Editor** menu and click **Options**.

    ArcScan uses the classic editing snapping environment rather than the Snapping toolbar.

2. Click the *General* tab.

3. Check **Use classic snapping**.

    When you enable classic snapping, it disables the Snapping toolbar's snapping environment for use in editing. Therefore, once you have completed your work with ArcScan, you should reenable the Snapping toolbar by unchecking the **Use classic snapping** box.
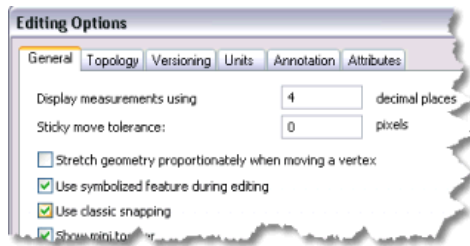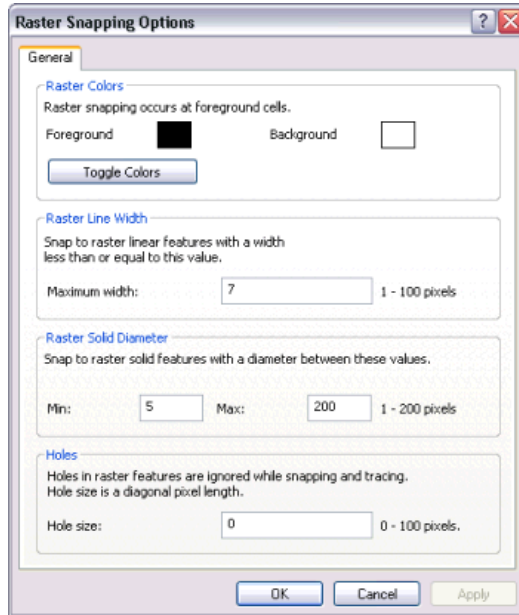

4. Click **OK**.

    The ArcScan extension is only active in an edit session. The Start Editing command allows you to begin an edit session.
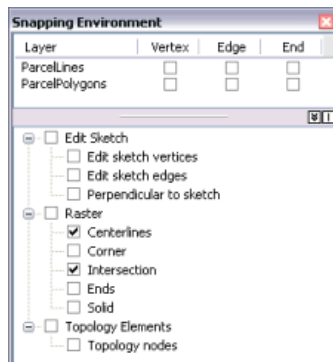
5. Click the **Editor** menu on the *Editor* toolbar and click **Start Editing**.

6. Choose to start editing on the file geodatabase workspace and click **OK**.

    Raster snapping requires settings that influence the behavior of the tracing. These options are set on the Raster Snapping Options dialog box.

7. Click the **Raster Snapping Options** button 📷 on the *ArcScan* toolbar to open the *Raster Snapping* dialog box.

8. Set the maximum line width value to 7. This setting will ensure that you are able to snap to raster cells that represent the lot boundaries.

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9. Click **OK**.

10. Click the **Editor** menu, point to **Snapping**, then click **Snapping Window**.

11. Click the plus sign next to **Raster** to expand it.

12. Check the **Centerlines** and **Intersection** options for raster snapping. You can close the window when you are done.

Now, you need to turn on SnapTips, which are pop-up messages that give you information on the type of snapping that is active as you move your pointer around the map.

13. Click the **Editor** menu, point to **Snapping**, then click **Options**.

14. Check **Show SnapTips**.

15. Click **OK**.

Creating line features by tracing raster cells

Now that you have set up your raster snapping environment, you are ready to begin tracing the raster cells. You will use the Vectorization Trace tool for this step.

Steps:

1. Click **Bookmarks** and click **Trace lines** to set the current view to the edit area of the exercise. When the display refreshes, you should see the trace area.
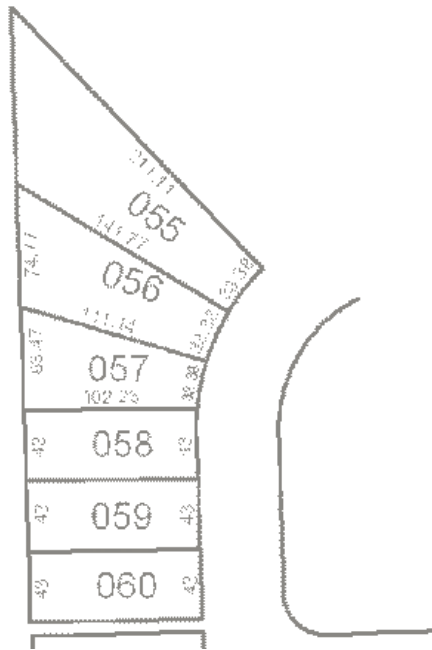

2. Click the **ParcelLines** line feature template in the *Create Features* window. This sets up the editing environment to create new features in that layer using the default attributes for that template.

3. Click **Vectorization Trace** tool on the *ArcScan* toolbar.

4. Move the pointer until it snaps to the intersection of the lot boundaries and click to start tracing.
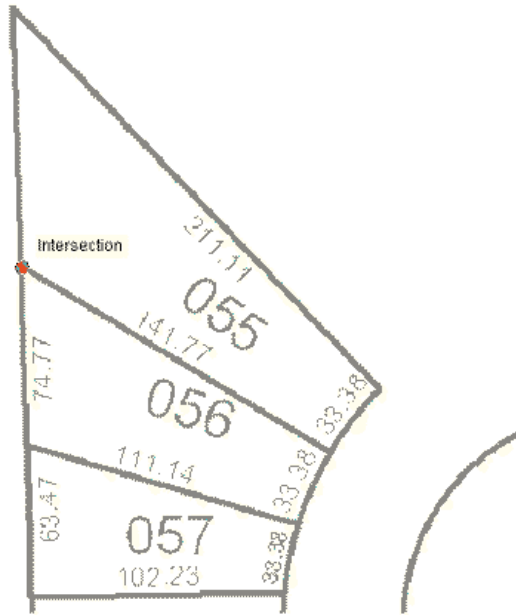
5. Point the **Vectorization Trace** tool downward and click to start creating the line feature.
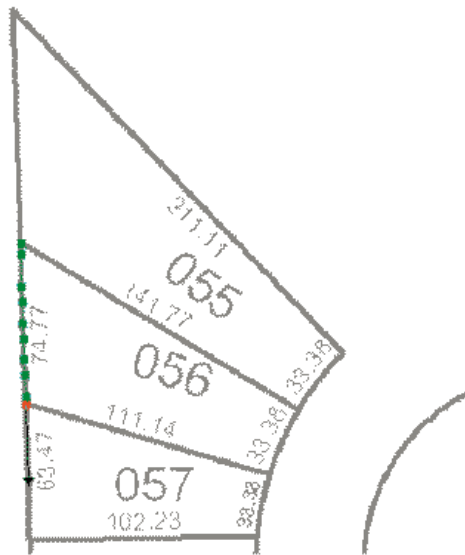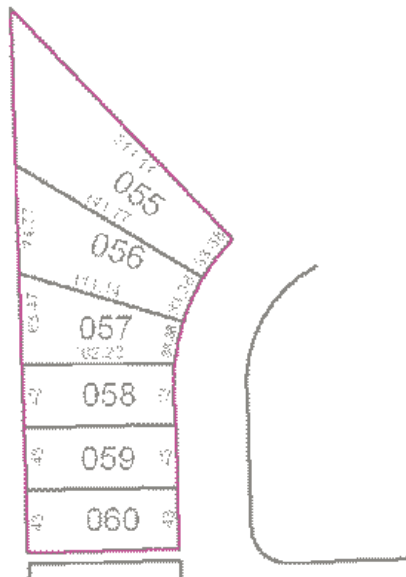

6. Continue to point and click with the **Vectorization Trace** tool to trace the exterior boundary of the lots.

7. Once you have finished tracing around the lot boundaries, press <u>F2</u> to finish the sketch.

A line feature now represents the exterior boundaries of the scanned parcel lots.

*Creating polygon features by tracing raster cells*

Now that you have successfully traced raster cells to create line features, you will create polygon features using the Vectorization Trace tool.

    Steps:

1. Zoom to the bookmarked extent called Trace polygons to get a better view of the area that will be traced. Click **Bookmarks** and click **Trace polygons**.

2. Click the **ParcelPolygons** polygon feature template in the *Create Features* window. You must change the active feature template to ParcelPolygons to create polygon features while tracing.

3. Click the **Vectorization Trace** tool 🖳 on the *ArcScan* toolbar.

4. Move the pointer until it snaps to the lower-left corner of lot 061 and click to start tracing.
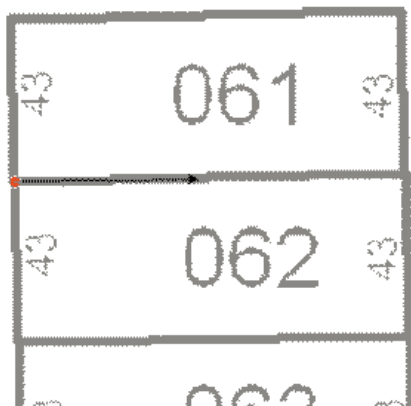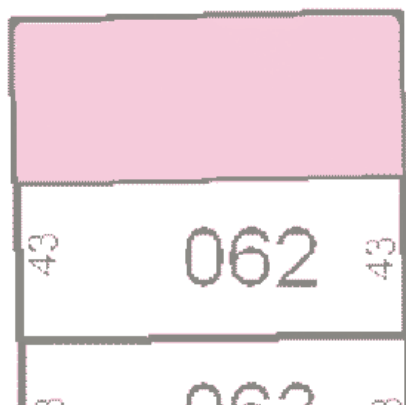

5. Point the arrow toward the lower-right corner of the lot and click to start creating the segments of the polygon feature.
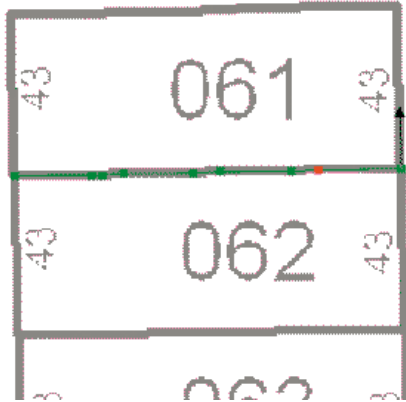
6. Continue to trace the lot boundary in a counterclockwise direction.
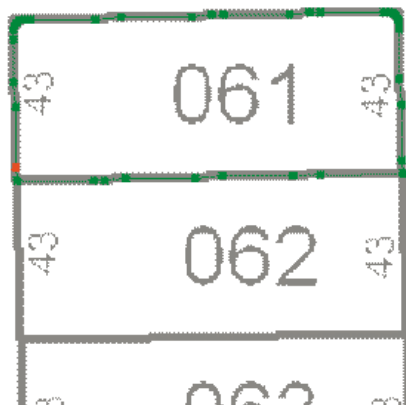
7. When the cursor has returned to the starting point of the trace, press <u>F2</u> to complete the polygon.

Once you have finished tracing the raster cells, you can stop editing and complete the exercise by saving your edits.

8. Click the **Editor** menu on the *Editor* toolbar and click **Stop Editing**.

9. Click **Yes** to save your edits.

10. To continue to the next exercise in the ArcScan tutorial, click Exercise 2: Automatic vectorization.

In this exercise you learned how to set the raster snapping options and environment, snap to raster cells, and trace raster cells to create new line and polygon features. These steps covered the main components of the raster tracing process. The next exercise will show you how to edit a raster layer and automatically generate features for an entire raster layer using the batch vectorization tools.

Exercise 2: Automatic vectorization

In this exercise, you will edit a scanned parcel map to remove cells from the raster that are not in the scope of the vectorization. Once the raster has been cleaned up, you will generate features using the batch vectorization mode. You will begin by starting ArcMap and loading a map document that contains the raster dataset and two shapefiles.

Complexity:
Beginner
Data Requirement:
ArcGIS Tutorial Data Setup

Setting up the ArcScan environment

Prerequisite:
This exercise builds on the ArcMap settings specified in the previous exercise. You need to have the ArcScan extension enabled, classic editing snapping enabled, and the ArcScan and Editor toolbars displayed.

Steps:

1. Click the **Open** button on the **Standard** toolbar.

2. Navigate to the **ArcScanBatch.mxd** map document in the ArcScan directory where you installed the tutorial data and select it (C:\ArcGIS\ArcTutor is the default location).

3. Click **Open**.

   If you still have the map document open from the previous exercise and are prompted to close it, do so without saving your changes.

4. Raster layers must be symbolized as two-color images to use the ArcScan tools and commands. You will change the raster symbology from stretched to unique values. Right-click the **ParcelScan.img** raster layer in the ArcMap table of contents and click **Properties**. The *Layer Properties* dialog box appears.

5. Click the *Symbology* tab on the *Layer Properties* dialog box.

6. Click **Unique Values** in the **Show** box.

7. Click **OK**.

Preparing the raster for vectorization: Raster painting

When performing batch vectorization, it is sometimes necessary to edit the raster image prior to generating features. This process is referred to as raster cleanup and involves the removal of unwanted cells from the

raster image that are not in the scope of the vectorization. ArcScan provides the tools to perform raster cleanup. You will now use the Raster Cleanup tools to remove unwanted text from the ParcelScan image.

Steps:

1. Click **Bookmarks** and click **Raster cleanup** to set the current view to the edit area of the exercise.
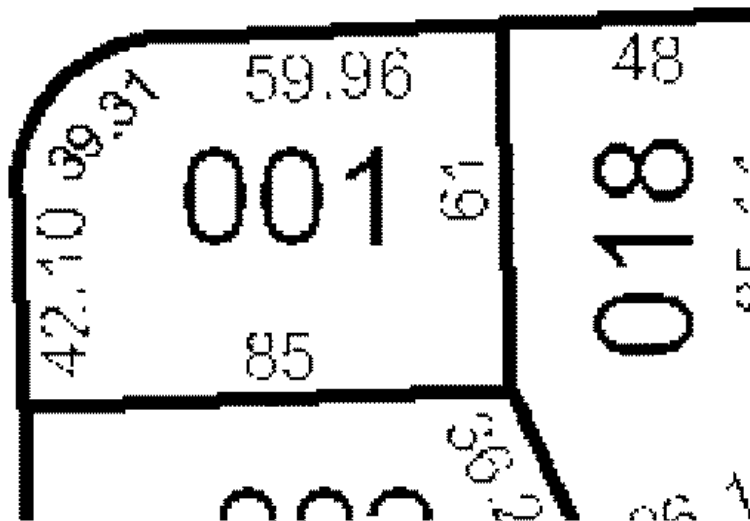
2. Click the **Editor** menu on the *Editor* toolbar and click **Start Editing**.

3. Choose to start editing on the file geodatabase workspace and click **OK**.

4. On the *ArcScan* toolbar, click the **Raster Cleanup** menu and click **Start Cleanup** to start the raster cleanup session.

5. Click the **Raster Cleanup** menu and click **Raster Painting Toolbar** to display the Raster Painting toolbar.

6. Click the **Erase** tool on the *Raster Painting* toolbar.

7. Click and hold to erase the text (59.96) located at the top of the parcel lot.
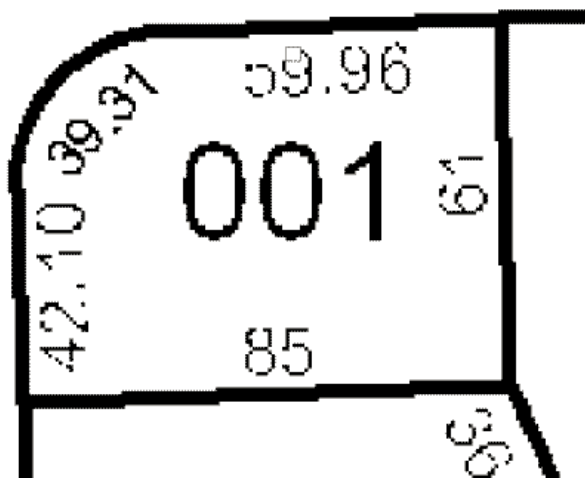
8. Continue to erase the text with the Erase tool until it has been completely removed from the image.
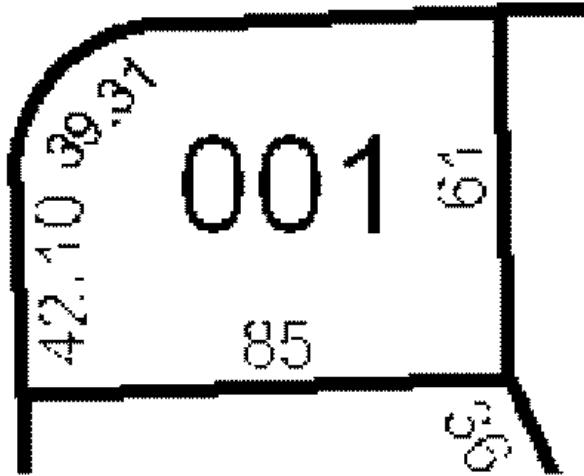
In addition to the Erase tool, the Raster Painting toolbar supports another tool designed to erase cells. This tool is called the Magic Erase tool, and it allows you to erase a series of connected cells by simply clicking or dragging a box around them.

9. Click the **Magic Erase** tool on the *Raster Painting* toolbar.

10. Drag a box around the text (001) located in the center of the parcel lot to remove it.
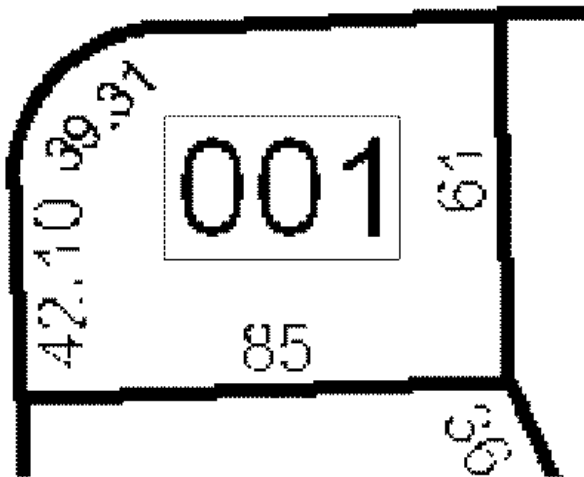
The text is now removed from the raster.
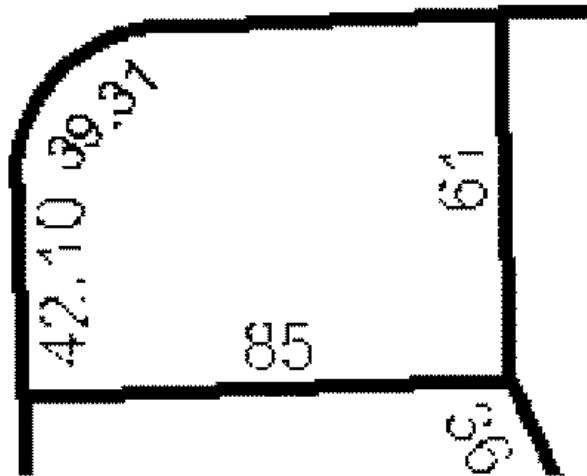
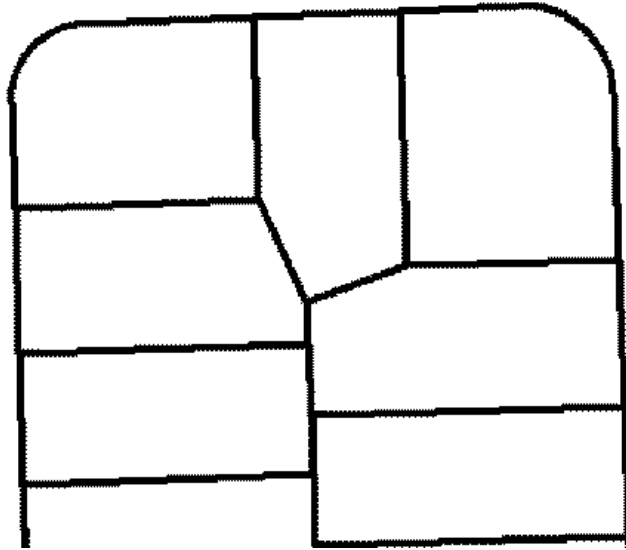*Preparing the raster for vectorization: Cell selection*

In the previous steps, you learned how to use the Erase and Magic Erase tools to remove unwanted cells from the raster image. However, if the image you are working with requires much cleanup, these techniques could be time consuming. To help streamline this process, you can use the cell selection tools in conjunction with the raster cleanup tools.

Steps:

1. Zoom to the bookmarked extent called Cell selection to get a better view of the edit area. Click **Bookmarks** and click **Cell selection**.
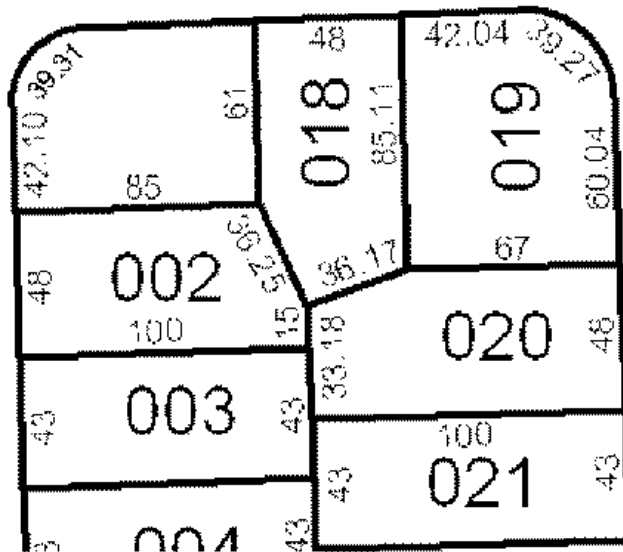
2. Click the **Cell Selection** menu and click **Select Connected Cells**.

3. In the *Select Connected Cells* dialog box, type a value of 500 for the total area of raster pixels. This expression will select all the cells that represent text in the raster.

4. Click **OK**. The cells that represent the text in the raster are now selected.

5. Click the **Raster Cleanup** menu and click **Erase Selected Cells** to delete the selected cells. The selected cells are now erased.

Specifying the vectorization settings

Batch vectorization relies on user-defined settings, which influence the geometry of the generated features. These settings can vary depending on the type of raster data you are working with. Once you have determined the appropriate settings for your raster, you can save them within the map document or to a separate file. You will use the Vectorization Settings dialog box to apply the settings.

    Steps:

1. Click the **Vectorization** menu and click **Vectorization Settings** to open the Vectorization Settings dialog box. You will now modify the vectorization settings to ensure optimal results when generating features.

2. Change the **Maximum Line Width** value to `10`.

3. Change the **Compression Tolerance** value to `0.1`.

4. Click **Apply** to update the settings.
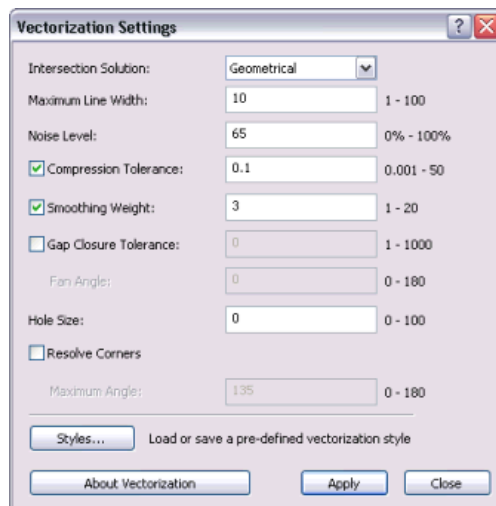
5. Click **Close**.

Generating features

ArcScan provides a way to preview the batch vectorization prior to generating features. This can help you save time by allowing you to see how the settings will affect the vectorization. When the settings are changed, the preview can be updated by clicking the Apply button located on the Vectorization Settings dialog box. This design allows you to fine-tune the vectorization settings.

The final step in the batch vectorization process is to generate features. The Generate Features dialog box allows you to select the vector layers that will store the new features and execute the vectorization.

Steps:

1. Click the **Vectorization** menu and click **Show Preview**. The vectorization preview is displayed on the map.
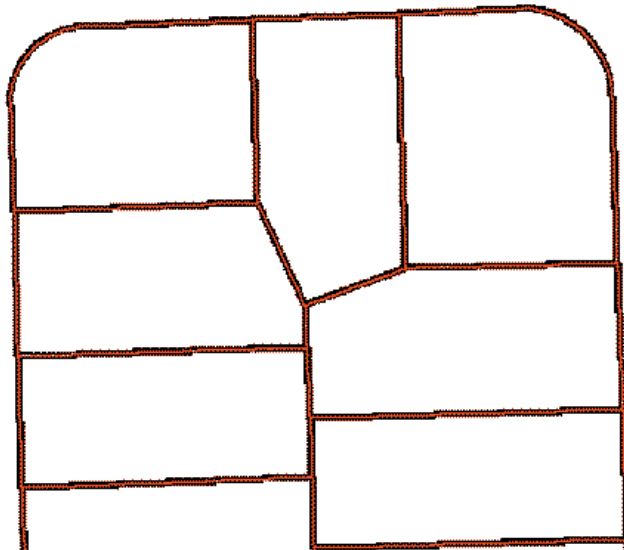
2. Click the **Vectorization** menu and click **Generate Features**.
3. Click the **ParcelLinesBatch** feature template, if it is not already the active line feature template.
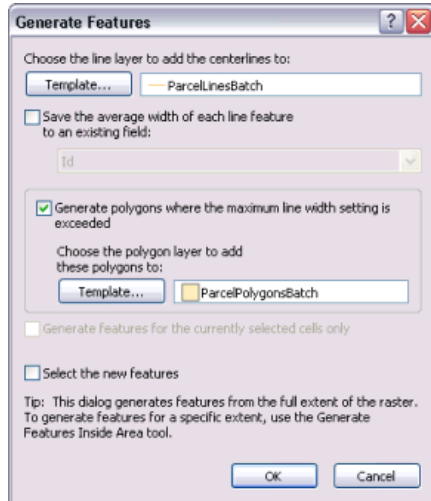
4. Click **OK**.

5. Right-click the **ParcelScan.img** raster layer in the ArcMap table of contents and click **Zoom To Layer** to view all the new features that were generated.
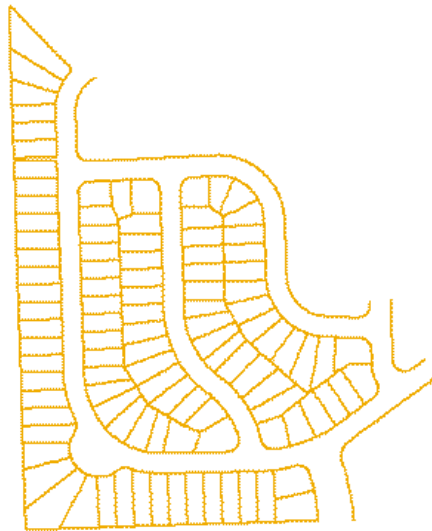
When the display refreshes, you should see the vector features that now represent the raster cells. Once you have finished generating features, you can stop editing and complete the exercise by saving your edits.

6. Click the **Editor** menu on the *Editor* toolbar and click **Stop Editing**.

7. Click **Yes** to save your edits.

8. If prompted to save your raster cleanup edits, click **No**.

9. You can close the map document (you do not need to save your changes) and ArcMap when you are done.

You have now completed the ArcScan tutorial. In this exercise, you learned how to use the raster cleanup and cell selection tools to edit a raster layer, apply vectorization settings, preview the vectorization, and generate features. These steps covered the major components of the batch vectorization process.