# Manual Digitizing Exercise

This exercise is useful for those that will have access to imagery. The following procedure will be the same for aerial photography or imagery. For this exercise, you will use imagery provided by GeoEye and manually digitize (what is referred to as heads-up digitizing) theoretical enumeration area polygons. Note: These areas do not represent the true sizes of any particular enumeration areas. As they vary widely depending on many factors (population density, dwellings, landscape, etc.) The spatial reference of the imagery has already been defined.

**Step 1: Create the enumeration area polygon in ArcMap.**

- **Open** the ArcMap document **exerciseDigitize.mxd** in the exercise folder, **C:\un\exerciseDigitize**.

- Click the **View** menu, then click **Bookmark**, and select the **Exercise Area** bookmark to navigate to area of interest.

- If not already activated, turn on the **Editor Toolbar** by selecting it from the **View -> Toolbars** menu.

- **Start Editing**.

- In the **Task:** box, select **Create New Feature** and for Target: **Enumeration Area.**

- Set the snapping of features. Click on the **Editor** drop-down menu and select **Snapping**. The snapping dialog window will appear.

- In the snapping dialog window, activate the **Enumeration Area** snapping to **Vertex** and **Edge**.
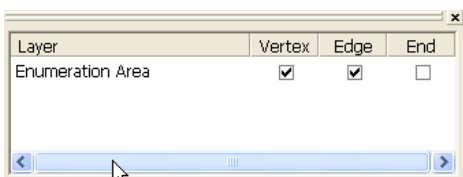
- Close **Snapping** toolbar.

- On main toolbar click Window -> Magnifier to open **Magnifier window**.
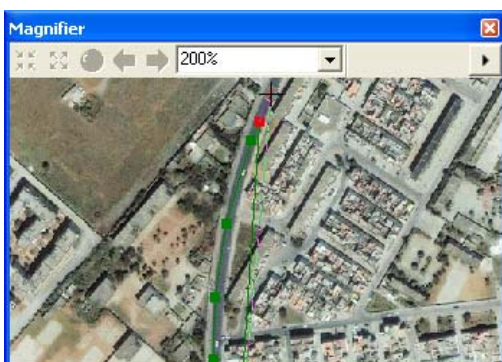
The magnifier window works like a magnifying glass: as you pass the window over the data, you see a magnified view of the location under the window. Moving the window does not affect the current map display.
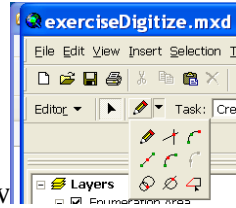
- Click the tool palette drop-down arrow and click the **Sketch** tool .

- Click the bottom left point of the street intersections depicted in the pink highlighted circle below.


- Digitize along the same roads as shown below using as many vertices as necessary. If needed, utilize the magnifier window to assist during this digitizing task. Double click on the last vertex to close the polygon.
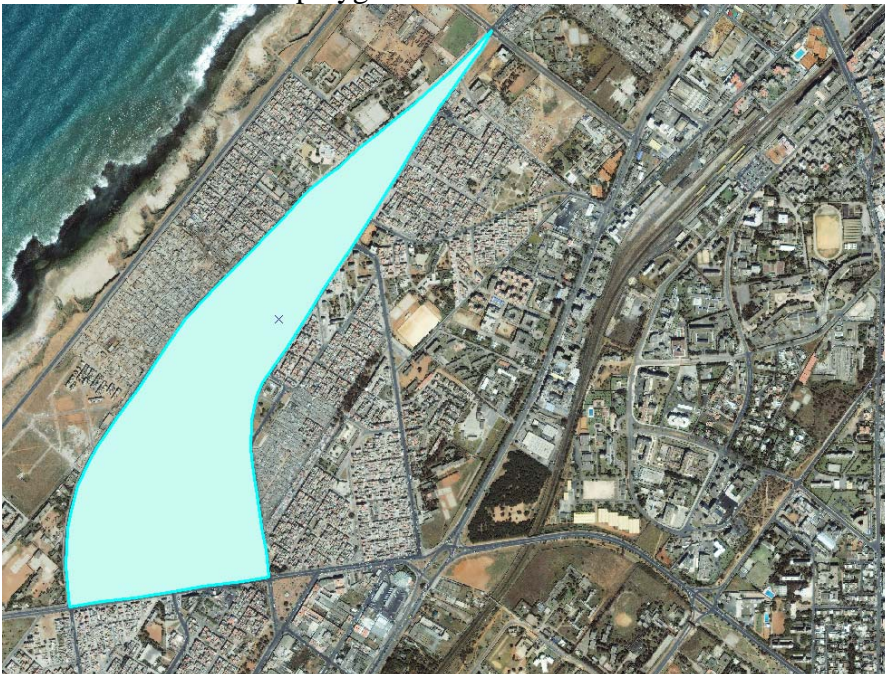
- Add attributes to the enumeration area feature. Click the **Attributes** button 🔲 on the Editor toolbar.

- Click on the **feature ID** on the left side of Attributes dialog box.

    The layer's attribute properties appear on the right side of the dialog box, and the feature flashes on the map.

- Click in the **Value** column on the right side and enter the following attribute values:

Attributes		
⊟ Enumeration Area	Property	Value
⊞ 0	FID	0
	UniqueID	1
	EACODE	504442220001
	EA	0001
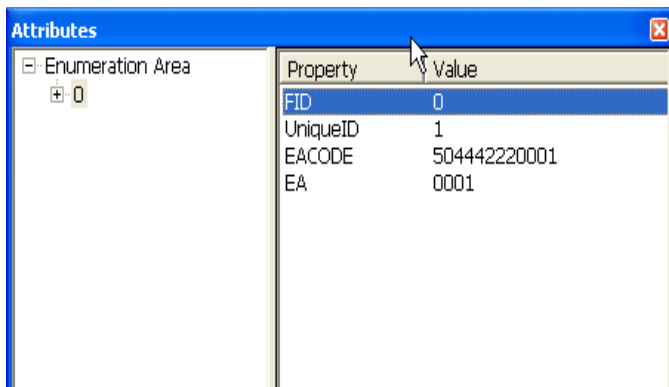
- **Save Edits** (Editor Toolbar, third menu choice)
- Keep the Edit toolbar open and **do not stop editing**.

Step 2:   Add second enumeration area

- Click the tool palette drop-down arrow and click the **Sketch** tool ✏️.
- Start this second enumeration at the top right point of the enumeration area created in Step 1. Notice the snapping to the corner node.

- Manually digitize along roads. Use the magnifier window if desired. See graphic below for enumeration area boundaries.

- Click on bottom right vertex of enumeration area created in Step 1. (at the yellow arrow)
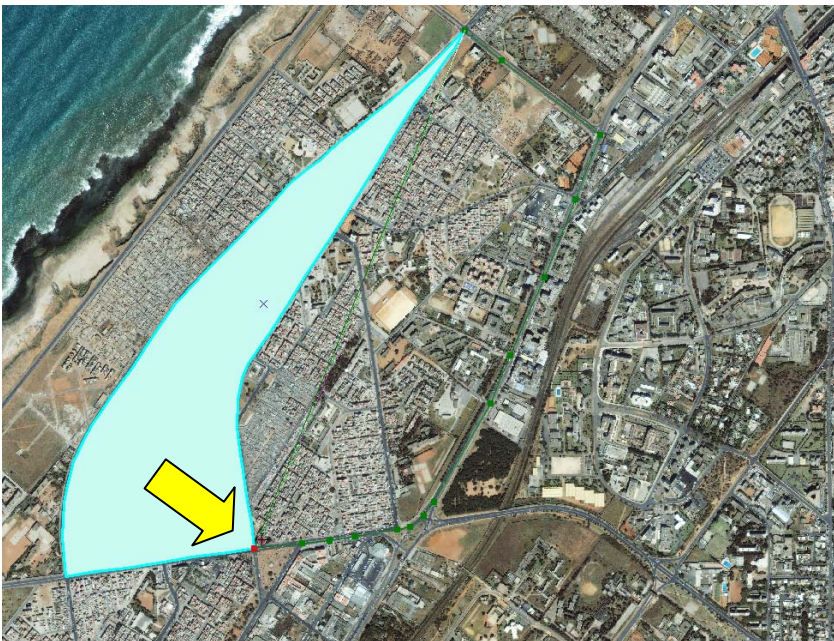
- Now click the tool palette drop-down arrow and click the **Trace** tool.

- Click to start tracing up along the first enumeration area's eastern boundary.

- Click to stop tracing at the top of the first enumeration area's eastern boundary.
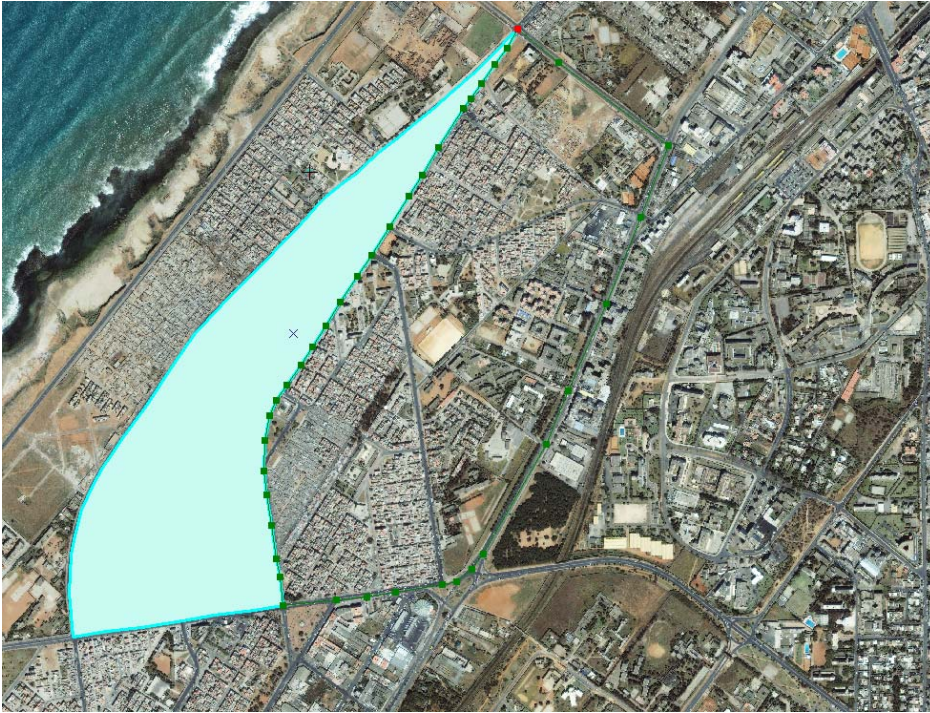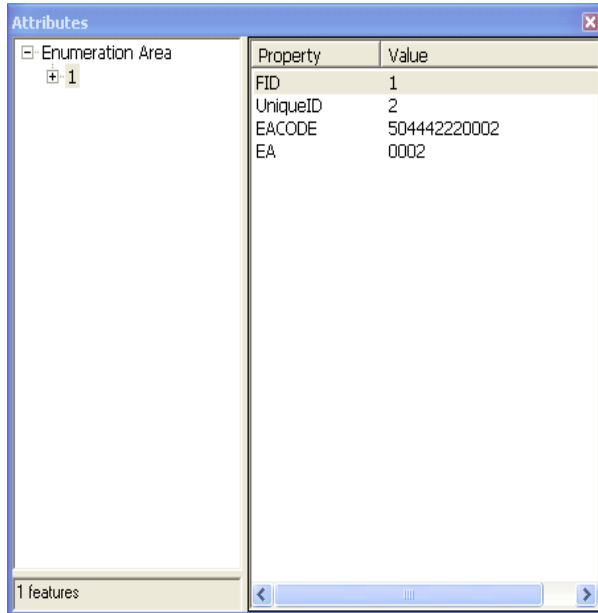

- When you are finished tracing, right click and select **Finish Sketch** from the context menu.

- On the Editor Toolbar, click the **Editor drop-down** menu, and select **Save Edits**.

- Add attributes to the enumeration area feature. Click the **Attributes** button [IMG] on the Editor toolbar.

  - Click in the **Value** column on the right side and enter the following attribute values

Attributes		
Enumeration Area	**Property**	**Value**
1	FID	1
	UniqueID	2
	EACODE	504442220002
	EA	0002
1 features		

Step 3: Learning about Map Topologies

Now that you have created features classes that are coincident (occupying the same space), you want to ensure future changes to these features does not break this connection. In these exercises we are using the ArcView license and thus cannot take full advantage of the 25 topological rules that geodatabases provide with an ArcEditor or ArcInfo license. With an ArcView license, you can create and edit *map topologies*.

A *map topology* is a simple topology that you can impose upon simple features on a map during an edit session. A map topology allows you to simultaneously edit simple features that overlap or touch each other in ArcMap. You can use the Topology Edit tool [IMG] on the Topology toolbar and the Modify Edge and Reshape Edge edit tasks to edit the features in a map topology. The features can be in one or more feature classes and may have different geometries. Line features and the outlines of polygon features become topological edges when you create a map topology. Point features, the endpoints of lines, and the places where edges intersect become nodes. A map topology can be applied to simple features in a shapefile or to simple feature classes in a geodatabase. The feature classes that participate in the map topology must be in the <u>same folder or geodatabase</u>.

Now let us work with a map topology.

- **Turn on the Topology Edit tool** by selecting it from the **View -> Toolbars** menu.

- **Start Editing**, if not already activated.

- Activate **map topology tool** .

- Select **EnumArea (Enumeration Area)** feature class dataset to participate in the map topology.

- Specify the **cluster tolerance**. The cluster tolerance is a distance within which features will be considered coincident.
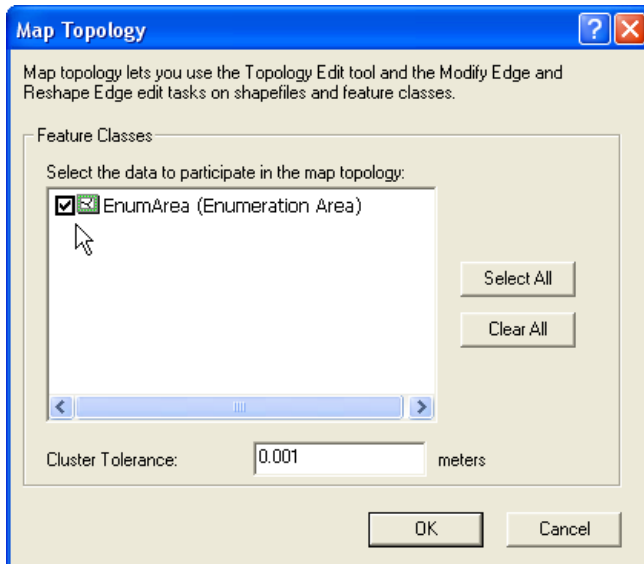
- Press OK

- Activate the **topology edit tool** .

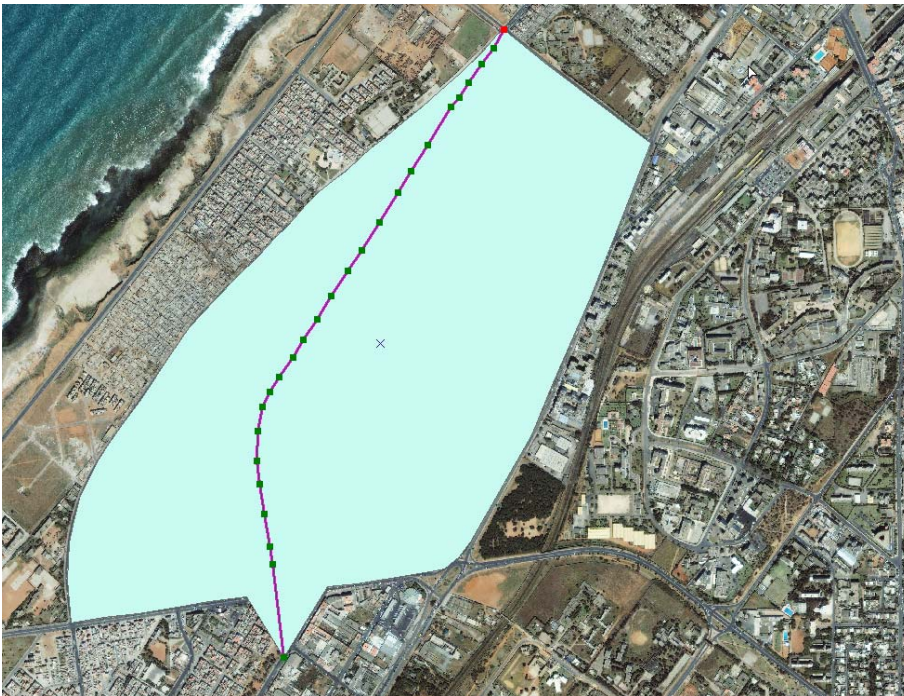- Click on vertex joining the two enumeration areas on the bottom center.


- Drag point down, let go of mouse button.

- Now double click the center line between the two enumeration areas.

Step 4: Improve the display of your map by improving Symbology.

- Set **transparency** for the enumeration area layer. Adding transparency to the top layers allows you to see them while still viewing underlying imagery.

- Click the **View** menu, point to **Toolbars**, and click **Effects**

> The Effects toolbar appears.
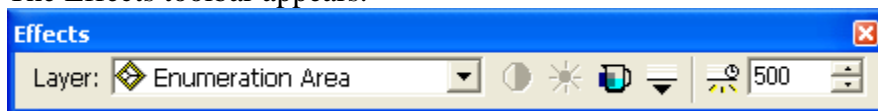
- Click the **layer drop-down arrow** and click the layer **Enumeration Area**.

- Click the Adjust Transparency button .

- Drag the slider bar to **25% or 30%** to adjust transparency.

- Change the colors of the individual Enumeration Areas.

- Activate the Enumeration Area Properties. **Right-click** enumeration areas in the **Table of Contents**, select **Properties**.
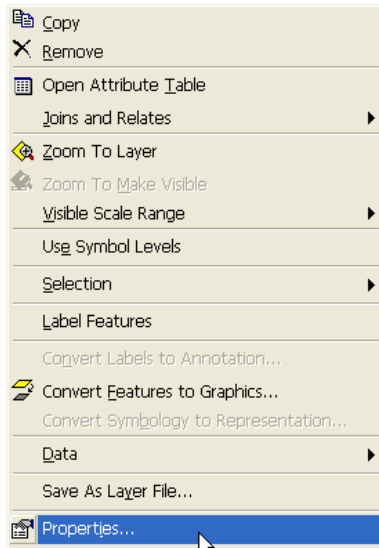
- Select the **Symbology tab**, under Categories select **Unique values**, for Value drop down select **EACODE**, select any color ramp that is appealing. Press the **Add All Values button** near the bottom and finally press **Apply.**
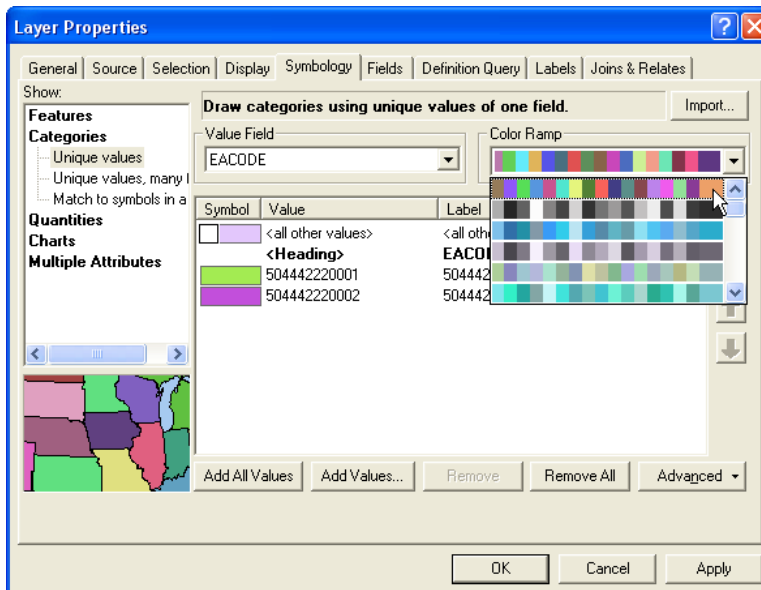
- Drag nodes to different points

Final result after a few more edits.

Thanks to

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for data and materials for this exercise.