

# CEIE 410/510 GIS in Engineering, Fall 2009

## Exercise 5 (Sept 28) - Editing

### Topics:

- Editing
- New layer creation

### Learning objective(s)

You have already seen how to edit attribute data in previous labs. That means that you know how to fix attribute errors. If you are familiar with databases, editing attribute data would be even simpler than you have seen in the lab. The objectives of this Ex are to:

1. Develop working knowledge of editing shapes by fixing the shape of an object (i.e. by fixing entity errors)
2. Create a new layer, add features and attribute data to this new layer. (This will be useful for your project).

Objective 1 is accomplished via adjusting I-95 features in the layer ***Boston Highways*** (Data given, directory *AdditionalData*) to the layer ***intrstat*** (Interstates) in USA.

We will accomplish the second objectives through practice exercises that will also serve your project.

### This Ex activity expects you to know the following:

- Copying and saving files
- Changing file attributes
- Opening existing ArcMap projects
- Creating a new ArcMap Project
- Differentiating between data files and project files
- Specific file extensions for ArcMap data files as well as project files
- Differentiating between attribute tables and features
- Adding new layers
- Zooming in and out to specified locations
- Making and clearing selections (visually and by SQL)
- Labeling features
- Editing *attribute* data
- Adding new attributes to tables

### Practice activities (Editing):

1. Start a new Ex session. Add states, cities and interstates from the data given, ***USA/features*** directory. Call it Ex 5a.
2. Make layers ***States, Cities and Interstate*** visible. The rest of the layers are irrelevant. You can keep them if you want.
3. Copy ***Boston Highways*** (directory *AdditionalData*) layer files to your zip disk
4. Change the attributes of all the files associated with the layer ***Boston Highways*** to enable changes to the data.
5. Now add ***Boston Highways*** to your Ex 5a.
6. Follow the instructions on the practice sheet.

At the end of this practice exercise, page me and I will grade this portion of the Ex work on the spot.

### **Exercise (New Layer Creation):**

We will learn to create a new layer through this exercise. Unlike previous labs, this exercise comes packaged with instructions. The instruction sheets are titled: *Creating a New Point Layer*. Follow the instructions on these sheets to complete this exercise.

After completion, you will have a layer called “Braddock Rd Signals”. Copy this layer as *lastnameLAB5* and submit this layer via e-mail (all files that are associated with it). If you do not follow this naming convention, no credit will be given to your work.

### **Questions:**

Answers to the following questions can only be found in the ArcView help system. Hence, you are forced to look-up the help.

1. Why is it important to set snapping environment when you are creating new features or editing existing features?
2. When you set the snapping to *vertex*, *edge* and *end*, it will enable you to:
3. Can you move the points, lines or polygons by specifying a different set of *x*, *y* values? Yes/No
4. Can you shift a line, point or polygon by a specified distance? Yes/No

### **Submissions for Ex 5:**

1. Appropriate questions in this document answered.
2. A demonstration of your editing skills (at the end of *practice activity* for editing).
3. Files pertaining to the new point layer created by you as part of the *exercise*. *This should serve as a preparation for the project.*

**Preliminary steps**

1. Start a new ArcMap project and save it as Ex 5a
2. Add layers *States, Cities and Interstate*
3. Copy *Boston Highways* (Disk 1 or 2, directory *AdditionalData*) layer files to your zip disk
4. Change the attributes of all the files associated with the layer *Boston Highways* to enable changes to the data.
5. Now add *Boston Highways* to your Ex 5a.
6. Follow the instructions on the practice sheet.

7 Zoom to the general area as shown  
Notice that *Boston Highways* is not aligned with *Interstates*. We are going to do this by fixing some portion of I-95 in layer *BH*.

8 Zoom further to Burlington/Woburn area.  
It is important to see your features in as much close-up as possible when you are editing.

This line will be moved to align with this line

10 On the *Editor Tool* bar, pick *Start Editing*

11 Select the folder in which the data you are going to edit is coming from.

After Step 11 notice other changes in appearance of Editor tool bar

9 Turn the *Editor tool* bar on

CEIE 410/510 Ex 5  
**Editing Features - 1**

Sketch Tools



There is really a lot to say about each of these features and it is not possible or practical to do so. I STRONGLY encourage to explore as many features as possible and have a general idea about what each of these options does. At a minimum, however, we will work with the Task: *Modify Feature* and *Shared Edit*.



Use this button to explore many of the features shown in this page

Editor

Task: Create New Feature Target: Boston Highways

- Create New Feature
- Auto Complete Polygon
- Select Features Using a Line
- Select Features Using an Area
- Extend/Trim Features
- Mirror Features
- Modify Feature
- Reshape Feature
- Cut Polygon Features

Start Editing  
Stop Editing  
Save Edits  
Move...  
Split...  
Divide...  
Buffer...  
Copy Parallel...  
Merge  
Union  
Intersect  
Clip...  
Integrate  
Validate Selection...  
Snapping...  
Options...

*Shared Edit* allows you to keep the connection between line segments and adjacent polygons

**Snapping**

Opens/closes the Snapping Environment window.

Use snapping to help you establish exact locations in relation to other features. With the Snapping Environment window you can set snap agents to all vector layers in your ArcMap document, or to the edit sketch. The snapping priority is defined by the order of layers in the window. You can drag layers up and down and the snapping priority will change.

Very Important that you understand this feature.

Snapping Environment

Layer	Vertex	Edge	End
Cities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boston Highways	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Interstate Hwys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
States	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

For all the *Vertices*, *Edges* and *Ends* of the Layer *Boston Highways*....

Perpendicular to sketch  
 Edit sketch edges  
 Edit sketch vertices

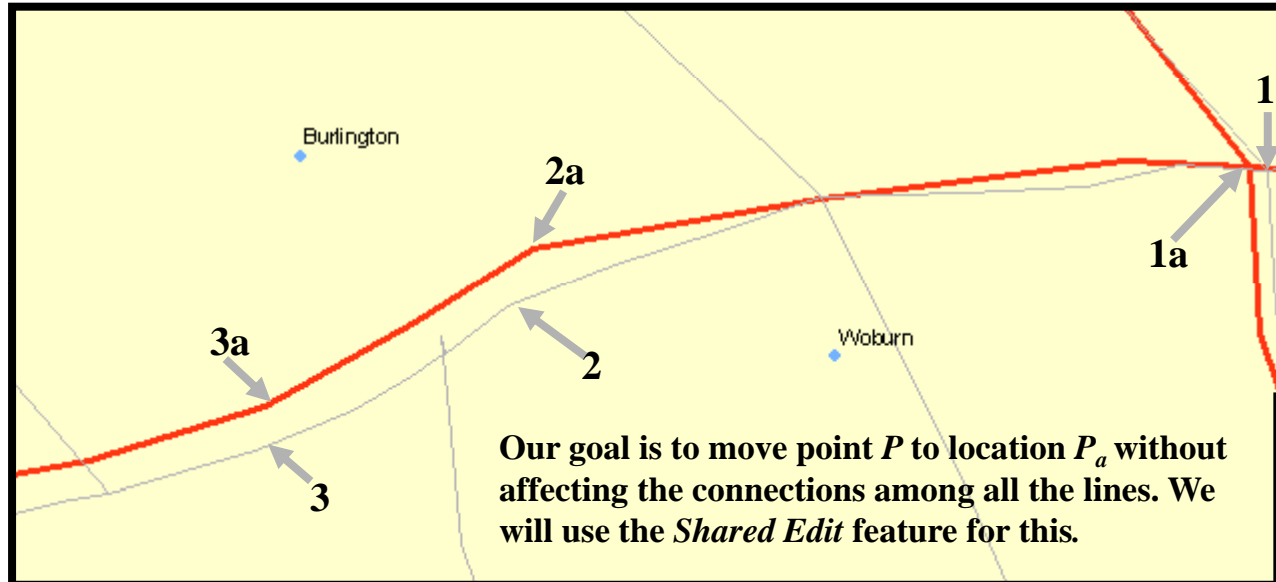
..These *snapping* options are in effect

# CEIE 410/510 Ex 5 Editing Features - 2

Perhaps the most challenging job you will face today is to understand how the editing process works. It is even more challenging to put the process as a Ex lesson. I will try anyway. First, I will throw some caveats:

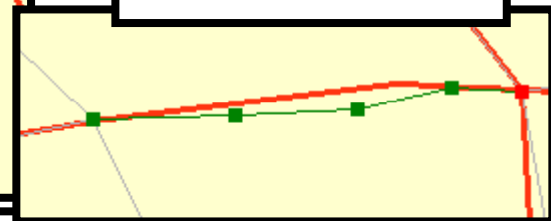
- If you are lost about the concepts of snapping and shared edit, it will be very difficult to conduct an intelligent edit session.
- A number of features will appear not working. You have to be persistent and keep trying.

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**Editing Features - 3**

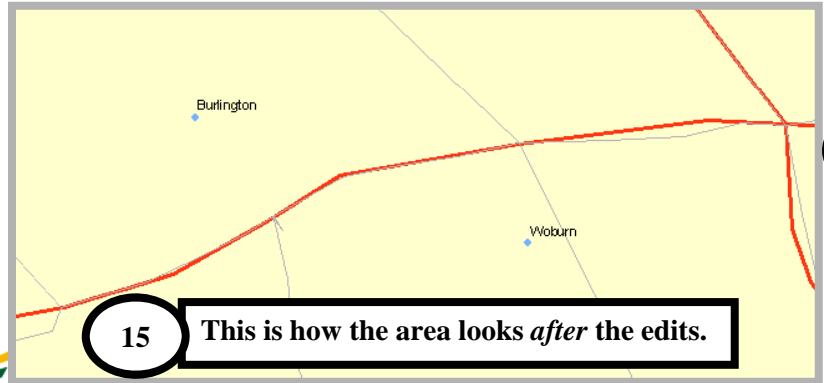


12  
Click on the *Shared Edit* Button

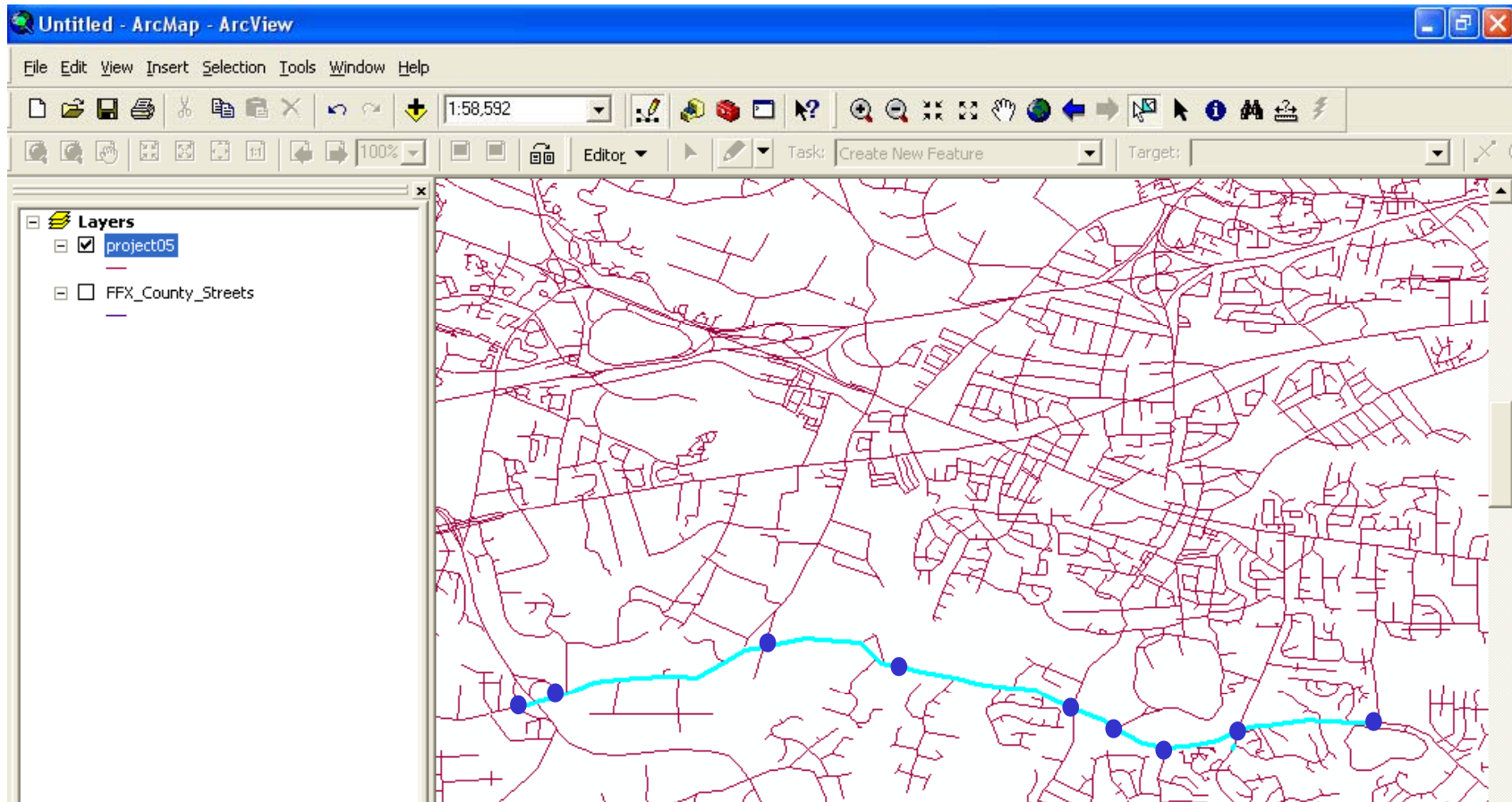
13  
Click on the link segment which needs to be moved



16  
Notice the change in appearance of this link. Move the cursor to the square (green or red) shape point and drag it to the correct location.



16  
That's all there is to correcting the shape. However there is more to editing than what we can possibly cover in a single Ex session. There are two good ways to learn more:  
1. You have a real editing job to do  
2. Practice, practice and practice!



**This Exercise is also your project need. Your objectives are to create**

- (1) a new point layer at every signal along the data collection routes, and**
- (2) a link layer that combines segments between those signals as ONE link.**

**The end product for the Braddock Rd signals layer (pt layer) and the link layer (line segments combined between signals), should look something like this after you edits.**

**Use the guidance provided in the following sheets (where I created a point layer for exits on I-95) and combined segments between those exits. (First review those steps carefully)**

# Creating a New Point Layer – 1

0

Start ArcCatalog

Select the directory where you will create new feature file

1

7

Add a new attribute *Location*, in which we give a name to the points we add.

After adding the new layer, open its attribute layer, which should look like this. Notice the three attributes that are created for you.

6

2

Select *New, Shapefile...*

3

...which will be a *point* feature. Technically, we should identify the coordinate system right in this window. We can do this indirectly when you are doing editing. So, ignore this aspect for now.

**Objectives of this exercise**  
Here we are using ArcCatalog to create a new *point* layer. Later, we will add this layer to an ArcMap project and edit the layer to:  
•Locate features and  
•To add attribute information

5

Separately, start an ArcMap session First add *Fairfax County Streets* from your Disk 2 Then add the newly created *I95-I395 Exits* layer to the project. Save the project as Ex 5b

4a

4b

Select a name for your new shape file: I called it *Project Signals*. After this step, the shapefile is created and ready to be added to ArcMap

After adding the new layer, which is currently empty, we are ready to digitize features in this layer. Digitizing is done through an *Edit* session.

Step 8 – Start an edit session

Step 9 – Set the snapping environment

Step 10 – add Fairfax County

Step 10 – Zoom into I-395 Area

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## Creating a New Point Layer – 2

Remember why we are doing this...

- To learn how to *edit* and *create new features*... and to
- Make that edited stuff useful to the project...

The screenshot shows the ArcGIS Editor toolbar and two dialog boxes. Annotations 8a through 10 highlight specific steps in the process.

**8a**: Editor Toolbar

**8b**: Start Editing button

**8c**: Select the directory which contains your new layer

**8d**: Task: Create New Feature

**8e**: Target: I95-I395Exits

**9**: Set the snapping environment

**10**: Copy Fairfax County Streets from your Disk to hard drive and add this layer. Zoom into I-395 in the general area of the Pentagon, which is where we will begin to Create New Features. For convenience, turn the labels (street names) on for Fairfax County Streets

**Snapping Environment Dialog:**

Layer	Vertex	Edge	End
I95-I395Exits	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
I-95xOV4-1-03-Unit1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Route_5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I-95xOV4-1-03-Unit10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
landmark	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interstate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FFX_County_Street	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Source Dialog:**

Source	Type
D:\Data\DataDiskSpring03\USA	Shapefile
D:\My Documents\MyCourses\CEIE410510\Spring2003\Pr...	Shapefile
D:\Data\WashingtonDC	Shapefile
D:\My Documents\MyCourses\Thesis\Durbois	Shapefile
D:\Data\GIS\Washington DC	Shapefile

**Available Layers:**

- I95-I395Exits
- I-95xOV4-1-03-Unit6 Events
- I-95xOV4-1-03-Unit5 Events
- I-95xOV4-1-03-Unit4 Events
- I-95xOV4-1-03-Unit3 Events
- I-95xOV4-1-03-Unit2 Events
- I-95xOV4-1-03-Unit1 Events
- FFX\_County\_Streets

# Creating a New Point Layer – 3

Use the *Pencil* as the sketch tool

11

Repeat steps 12a-12c for exits indicated by steps 13-16.

After you are done with step 16, do the following.

- Stop editing and save your work.
- Submit your work in the form of the point layer via e-mail (I need all the files)

12c

Enter the name of the exit

12 b

13

12a

Click on I-395 and N Boundary Drive crossing (it is not an intersection) as the point representing this exit

14

15

16

Property	Value
FID	7
Id	0
Location	Washington Blvd

Property	Value
FID	9
Id	0
Location	Washington Blvd 2

Property	Value
FID	5
Id	0
Location	Jefferson Davis +



Use Project05 line layer to create your new point layer by using the steps outlined here.

