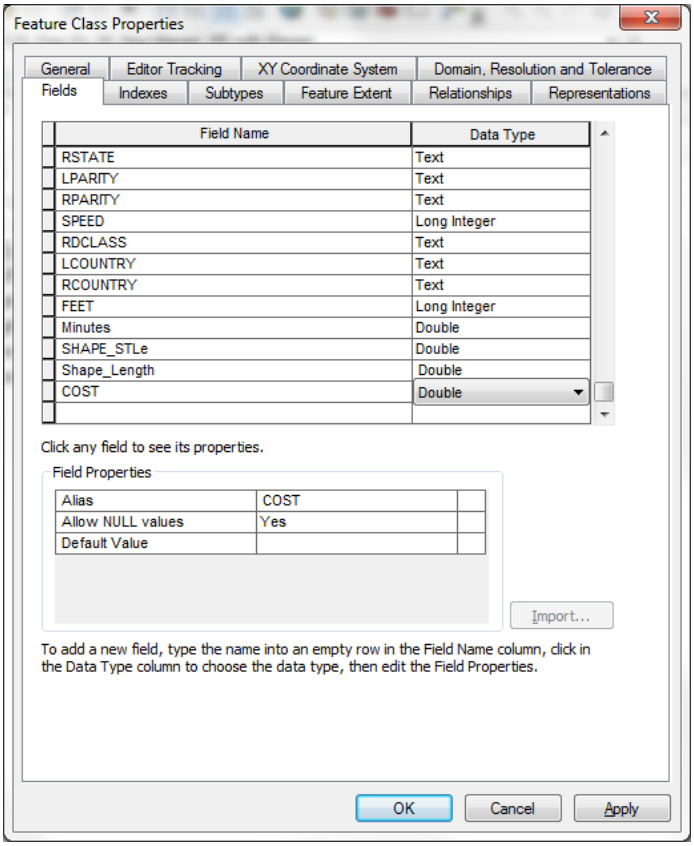
Exercise 8 Exploring Bangor

This lab is designed to provide you with several useful skills; i.e. hyperlinking images, geocoding addresses, adding X,Y data and using network analyst to create the shortest path. We will reuse the geodatabase created in Ex_03, and the map created in Ex_07.

Procedures:

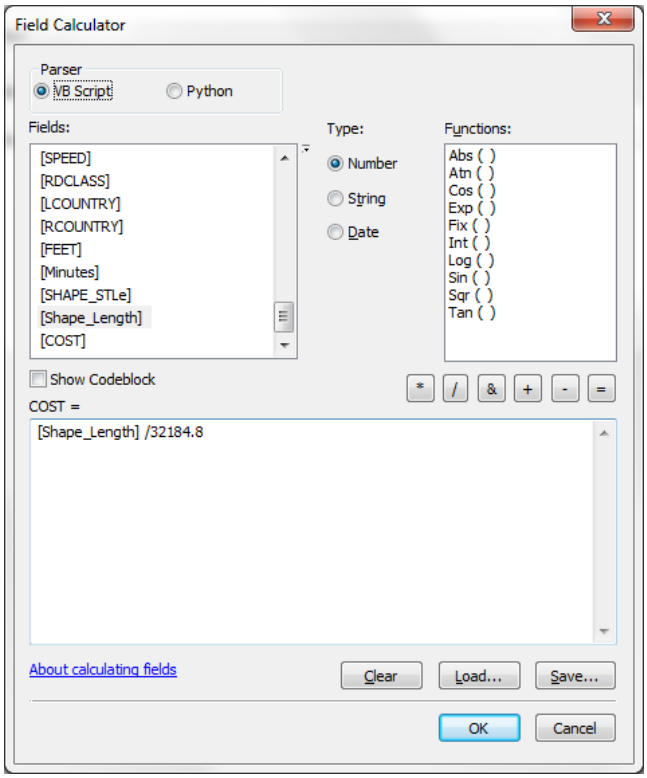
Part A: Preparing the Base Map

1. Download and unzip the Ex_08 data
2. Open ArcCatalog.
   a. Copy the geodatabase (Bangor_ME) from Ex_03.
   b. Paste it into your Ex_08 folder.
   c. Copy Ex_07 and paste it into your Ex_08 folder and rename it Ex_08
3. Import the following into your geodatabase:
   a. AddressTable (Addresses$)
   b XYTable (XY_Data$)
4. Right-click on BGR_Rds and click on the Fields tab. Scroll to the bottom and add the field COST (type double).



5. Open ArcToolbox > Data Management Tools > Fields > Calculate Field.
   a. The Input Table is BGR_Rds,
   b. The Field Name is Cost.

c. Click on the calculator to the right of the Expression field. We are going to assume an average speed on Bangor roadways as 20 miles per hour or 32,184.8 meters/hour.
d. Enter the following calculation [shape_length]/ 32184.8 and click OK
e. Click OK to close all dialog boxes.
f. Close ArcToolbox.
g. The COST field should now be filled with values.



6. Right-click on your Feature Dataset and select New->Network Dataset.
   a. Accept the default name (Bangor_ND) and click Next.
   b. Check BGR_roads, click Next
   c. Global Turns: yes, click Next.
   d. Skip the next screen, click Next.
   e. Elevation: None, click Next.
   f. Select Cost, click Next.
   g. Skip the next screen, click Next.
   h. Directions: no, click Next.
   i. Click Finish
   j. Say yes to build the network.
   k. If you get a message saying the Network was built with some errors, don't worry, they are minor.
7. Again at the geodatabase level, create an Address Locator (New->Address Locator).
   a. Click on the folder to the right of Address Locator Style to open the Locator dialog box.
   b. Scroll down and select US Address- Dual Ranges., click OK.

c. Select your BGR_roads file as the Reference Data. The fields will automatically be filled in.
d. Save your locator in your geodatabase as BGR_Locator.
e. Click OK.

8. When the address locator is created, close ArcCatalog and open ArcMap to Ex_08.mxd
9. From the File menu, choose Map Document Properties:
   a. Change the Title to Ex_08 A Bangor Tour.
   b. Hyperlink base: This is the complete path to the images; e.g. (K:\COS120_Prep\Ex_08\Images)
   c. Set the default geodatabase to Bangor_ME in your Ex_08 folder.
   d. Pathnames: Place a check next to store relative pathnames.
10. Change the name of the data frame to Bangor Tour
11. Activate the Neighborhood Schools data frame .
    a. Copy schools.
    b. Activate the Bangor Tour data frame.
    c. Paste schools.
    d. Change the color to green.
12. Add the Network Dataset (Bangor_ND), and the two tables to your project.
13. From the File menu select Add Data >Add XY Data. Verify that all of the fields have been filled in correctly.
    a. Edit the projection, as the data is geographic, NAD 83.
    b. When done, click OK and an XYTableEvents should be added to your map, and the points should be visible on your map.
14. Export the Events layer to your feature dataset as Sites_1.

Part B: Geocoding Addresses

Geocoding is the process of assigning a location, usually in the form of coordinate values (points), to an address by comparing the descriptive location elements in the address to those present in the reference material. Addresses come in many forms, ranging from the common address format of house number followed by the street name and succeeding information to other location descriptions, such as postal zone or census tract. An address includes any type of information that distinguishes a place.

From simple data analysis to business and customer management to distribution techniques, there is a wide range of applications for which geocoding can be used. With geocoded addresses, you can spatially display the address locations and recognize patterns within the information. This can be done by simply looking at the information or using some of the analysis tools available with ArcGIS. You can also display your address information based on certain parameters, allowing you to further analyze the information.

Your first step when you want to find something on a map is to have the right map. There is no way you will find your way to 380 New York Street in Redlands, California, if you only have a map of Canada. Also, you won't be able to pinpoint the address very well if your map only shows highways and major cities. Your map must have enough detail of the area to pinpoint the location for which you are searching.

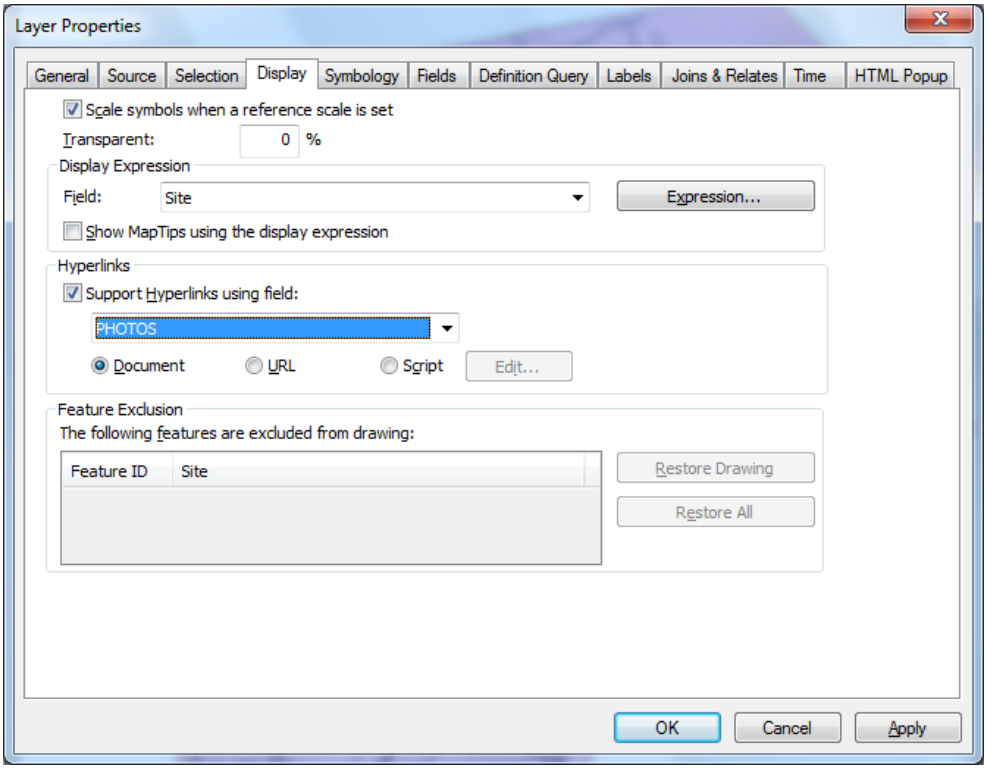
It is no different when geocoding in ArcGIS. The layers that you use for creating an address locator, known as reference data, need to have details of the specific point you want to find. When looking for

addresses, the primary reference data usually consists of a street network, but a parcel map can also be used as well. The important thing is that the data has the detail that you want to find[1].

1. From the Customize menu select Toolbars, and add the Geocoding Toolbar.
   a. Click on the mailbox, and add your BGR_Locator.
   b. Click OK.
   c. In the Geocode Addresses dialog box, change NAME to STR_ADD.
   d. Save the result as a shapefile in your EX_08 folder.
   e. Click OK.
2. If all went well, you should have 100% match, and 13 new points have been added to your map.
3. Export the geocoding results to your geodatabase as Sites_2, then remove your geocoding results.
4. Change the color and size (size 7) of your Sites_1 and Sites_2 symbology so that they are easily distinquishable.
5. Close the Geocoding toolbar

Part C: Hyperlinking Photos

1. Open the attribute table for each of the Sites layers and note the field called PHOTOS. Close the tables when done.
2. To set up the hyperlinks, right-click on the Site_1 layer in the table of contents.
   a. Click the display tab in the Properties dialog box.
   b. Check Support Hyperlinks using field and click the dropdown arrow to select the hyperlink field (PHOTOS)
   c. Click OK.
3. Repeat for Sites_2



[1] From the ArcGIS Desktop.

4. Use the hyperlink tool and click on the various sites to check your results. Hold the cursor over the site until the path appears as a tooltip, then click the mouse. Note that 2 of the sites did not have images and have slightly different symbols from the other sites.

Part D: Creating the Shortest Path for the Tour

1. Add the Network Analyst toolbar.
2. Open the Network Analyst window by clicking on the Network Analyst Window iconn on your new toolbar. A new panel should open on the left of your screen. If you don't see it, check behind the Table of Contents.

3. On the Network Analyst toolbar drop down menu, select New Route.
4. The Network Analyst Window now contains empty lists of stops, routes, and barriers categories. Additionally, the table of contents contains a new route analysis layer.
5. There are two ways to add stops: from a point feature class or by adding points to the display using the Create Network Location tool. We will use the first method.
   a. In the Network Analyst Window, right-click Stops and click Load Locations.
   b. Browse to your Sites_1 feature and click OK. Expand Stops in the Network Analyst Window.
   c. Repeat with the Sites_2 feature.
   d. You can change the order of the Stops by dragging and dropping. Arrange them in some logical order.
   e. To return to the starting point, copy the first Stop and paste it at the end of the list.

6. Click the solve button to get the best route.
7. Create a layout showing your route.