Getting Started Using ArcMap 9.x: *Basic procedures to download, open, manipulate and print spatial data*

These procedures outline:

A. Downloading spatial data (from the Ryerson University Library website)
B. Uncompressing files
C. Opening the spatial files in ArcMap 9.x
D. Changing the appearance of the newly added layers
E. Browsing through the attribute table
F. Preparing the layout for printing and exporting the map into various file formats.

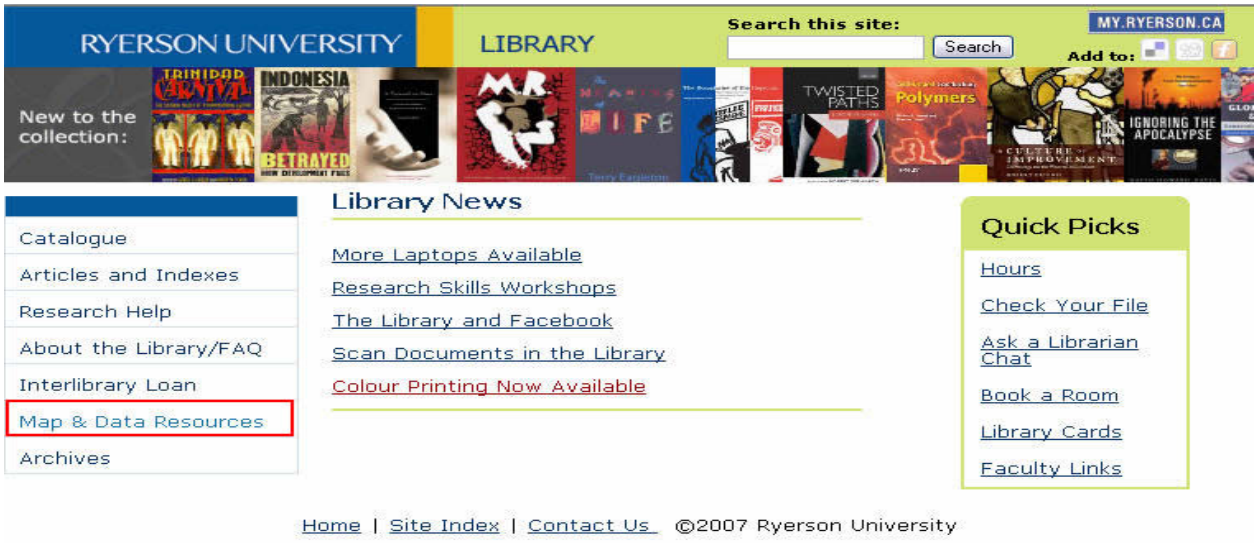
Appendix A: Setting the appropriate projection

In order to use these instructions, you must have ArcMap 9.x. In this example, we are going to use shape files depicting major roads and highways, golf courses and a City of Toronto boundary file that have been downloaded from the Ryerson University Library website.

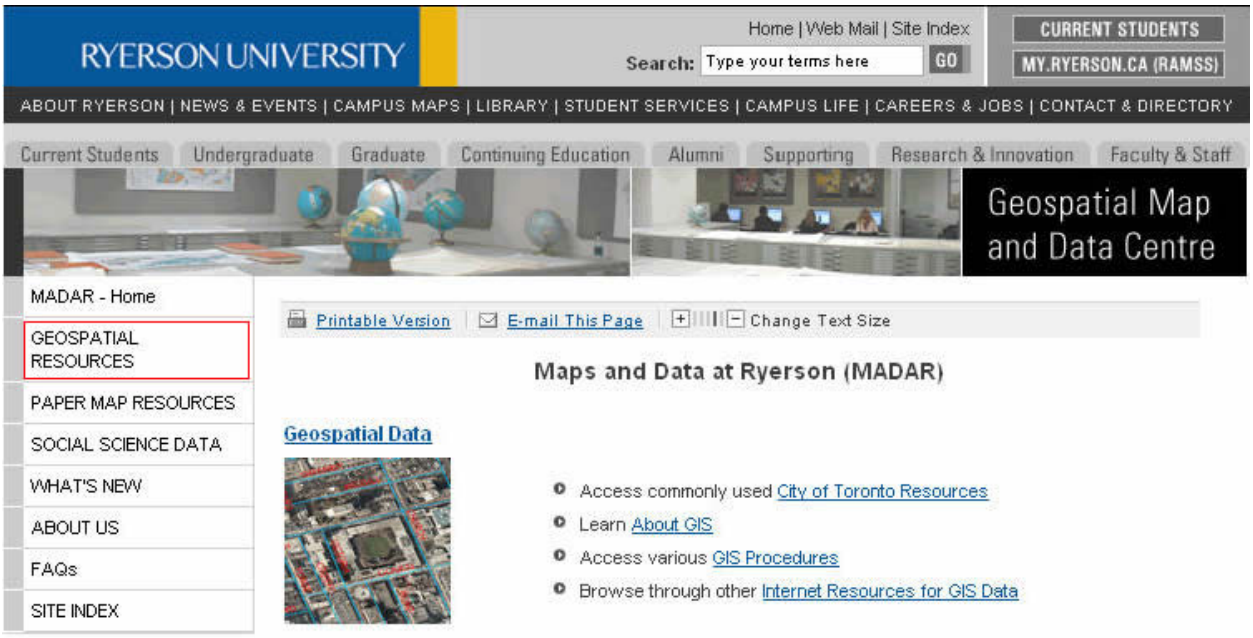
A. Downloading spatial data from the Ryerson University Library Website

The files that will be used in this example are all found on Ryerson University's Geospatial Map and Data Centre website. The files are part of the DMTI Route Logistics (version 2005.3) series. These are detailed digital map files for the City of Toronto containing generalized land use, specific sites for food and lodgings, government services, recreation, shopping, building footprints, churches, schools, and transportation services. In this example three files will be downloaded: major roads and highways, golf courses, and a City of Toronto boundary file.

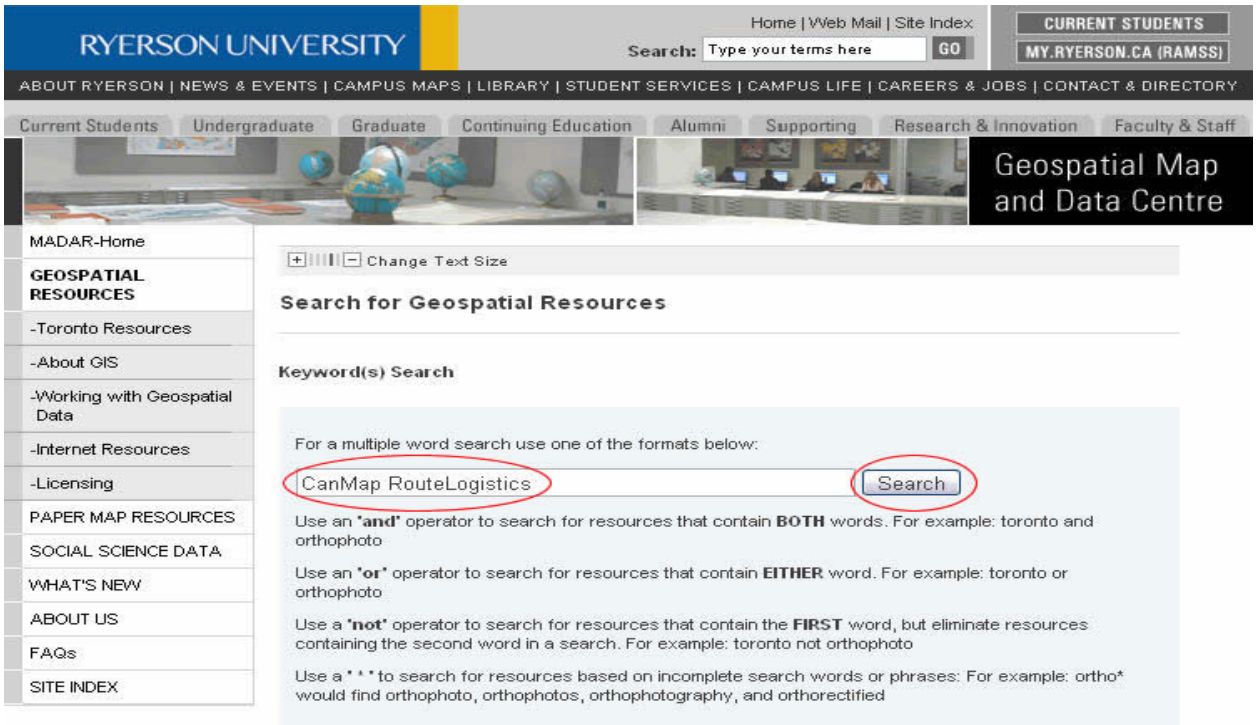
1. Browse to the Ryerson University Library website (www.library.ryerson.ca) and *click* **Map & Data Resources**. This will take you to the Geospatial, Map & Data Centre page.



2. *Click* on **Geospatial Data**. This will take you to the Geospatial Data page where you can read about and link to tutorials such as this one that give step by step procedures of how to use and manipulate various spatial data.

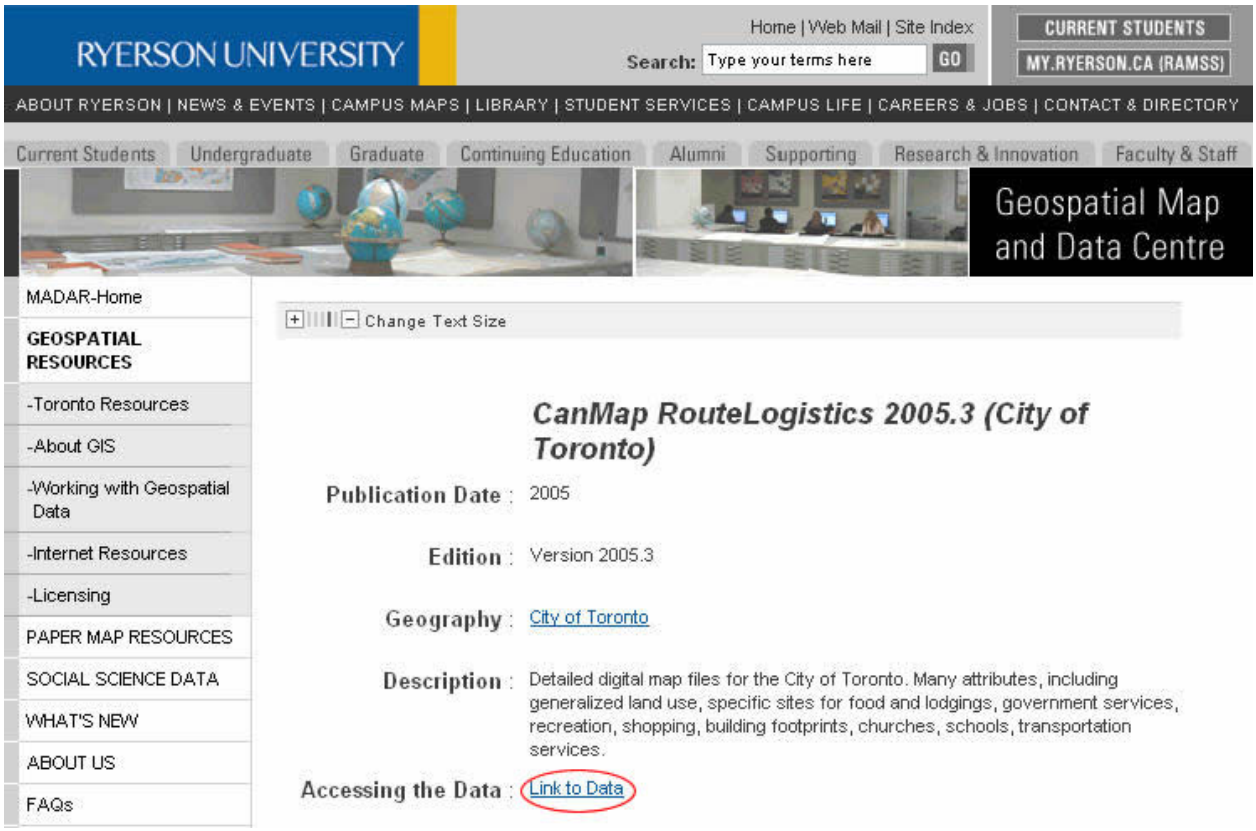


3a. In the search textbox, type in **canmap routelogistics**. *Click* **Search**.



b. Scroll to and *click* the record titled **CanMap RouteLogistics 2005.3 (City of Toronto).** **Note**: Do not click the record ending in CMA Toronto.

4. This is the record information page that gives detailed information about the data that you are about to download. *Click* **Link to Data**.



5. You will then be asked for your user name and password (the same as your Ryerson e-mail and password), fill this information out then *click* **Login**.
6. Read the DMTI Data Release Agreement then *click* **I Agree**.

c. The view data is a page listing all the various DMTI files associated with the **CanMap RouteLogistics 2005.3 (City of Toronto).** In this example we want to use major roads and highways, golf courses and the City of Toronto boundary file.

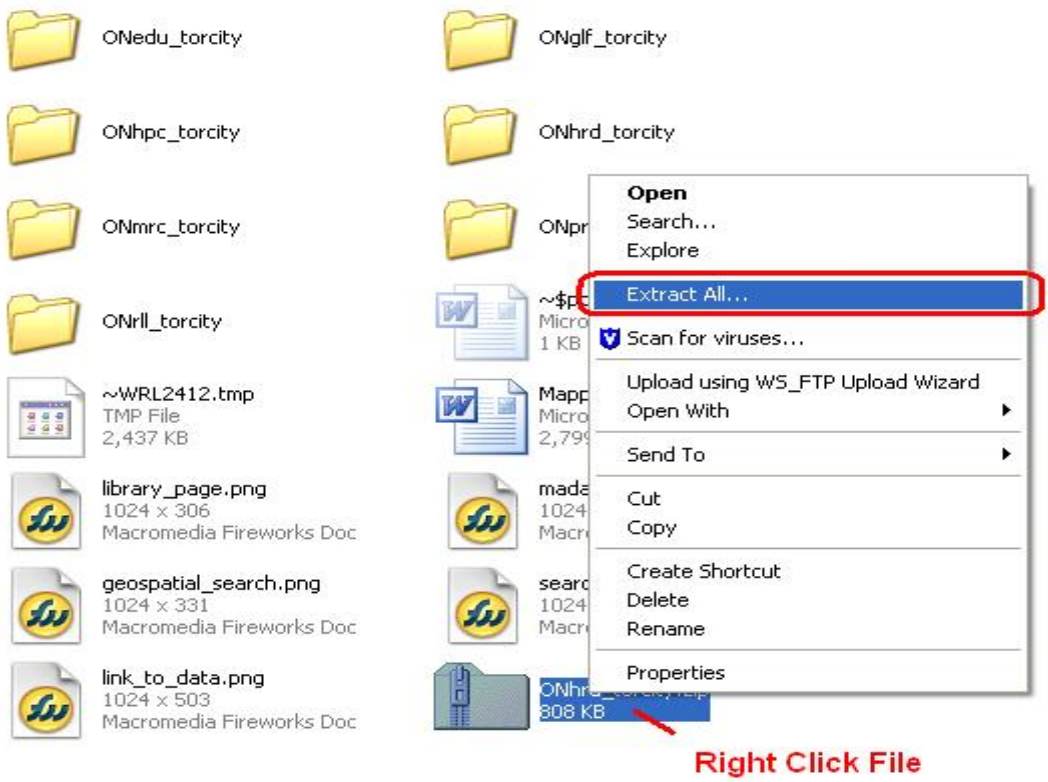
4. Scroll down and locate the follow files **ONhrd_torcity.zip, ONglf_torcity.zip,** and **ONmun_torcity.zip**.

d. Once each file is *clicked*, you will be prompted to Open or Save each file. **Save** the file to an appropriate location on your hard drive. Repeat this step until all three files have been successfully downloaded.

B. Uncompressing the Downloaded Files

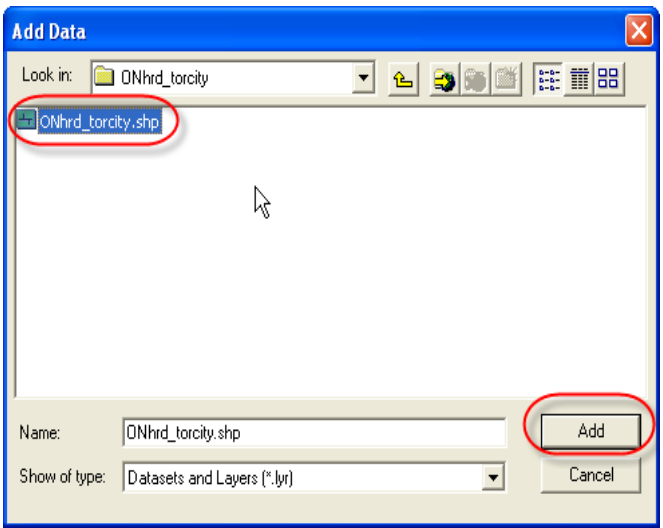
As you may have noticed while downloading the files, the extension for all the files was .**zip**. This is a Zip file or compressed file. Files are stored in this format on the server to save space. The following section outlines the procedure for uncompressing these files.

1. Browse to the location of the file.
2. *Right click* the desired file.
3. In the drop down menu, *click* **Extract All** and then follow the instructions in the **Extraction Wizard** for each file downloaded.



C. Opening the Spatial Files in ArcMap 9.x

ArcMap 9.x is software that allows the user to view, manipulate or create spatial data. ArcMap is part of the ArcGis software package created by ESRI. This section will demonstrate how to open and manipulate one or more files in ArcMap 9.x.



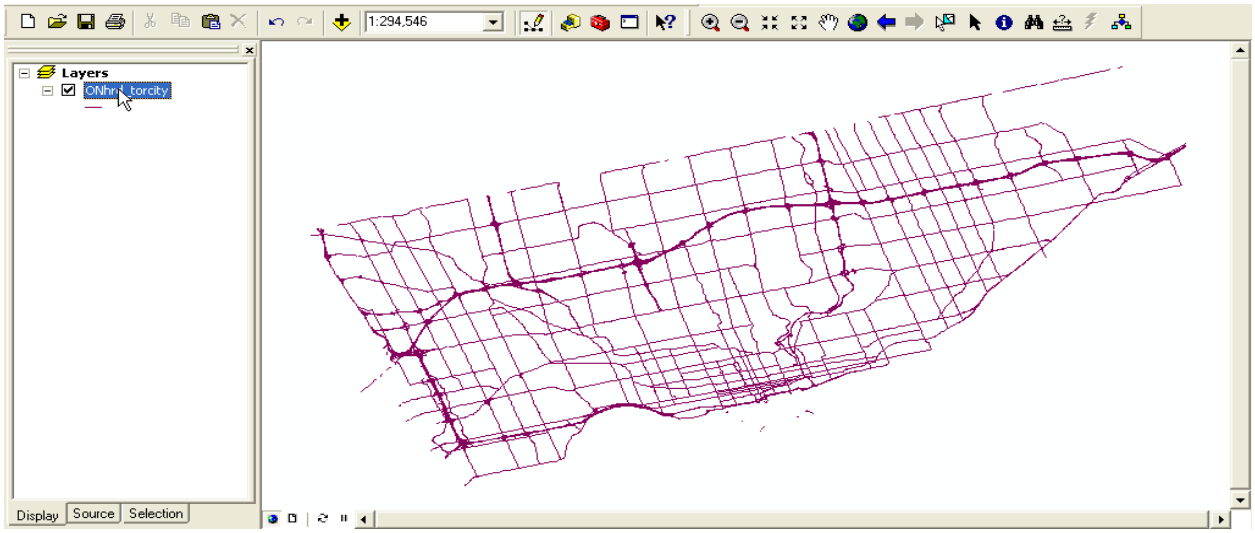
1. The first step is to open ArcMap. *Double-Click* on the **ArcMap 9.x** icon or *Select* **Start > Programs > ArcGIS > ArcMap**. ArcMap should automatically prompt the option to **Add Data**.

Otherwise, *Click* the **Add Data** button  .

2. In the **Add data** window, browse to the shape file that you wish to add. *Double click* the **Onhrd_torcity** folder to gain access to **Onhrd_torcity.shp**. **Note**: If there were more than one file in this folder, you can hold down the **CTRL** or **Shift** key to select multiple files and open them at the same time.

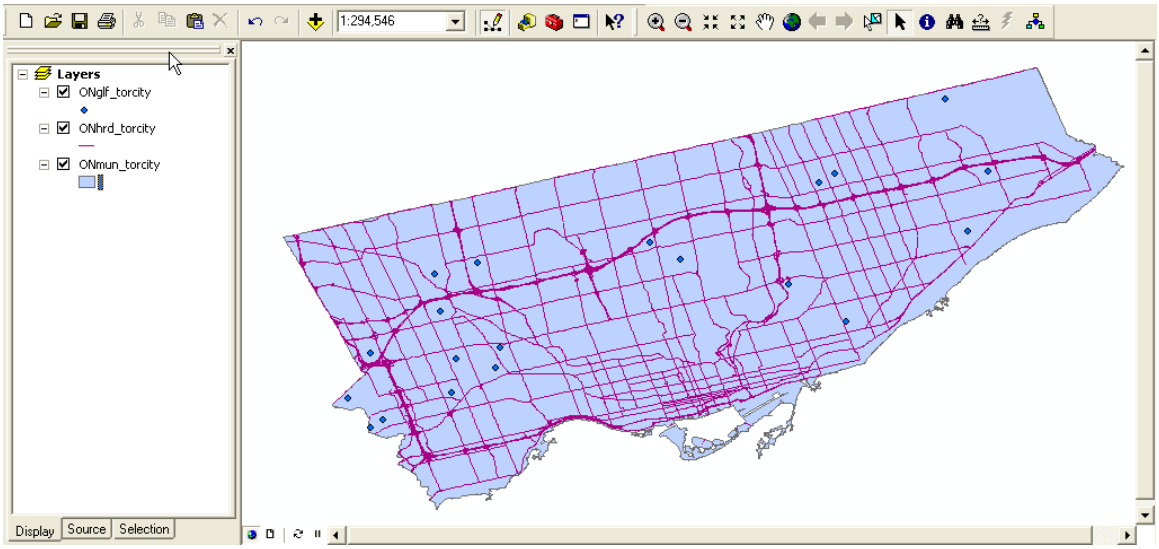
3. *Click* **Add**.

Your layout view (main viewing window) should show a file similar to the one below. **Onhrd_torcity** is a file depicting all of the major roads and highways in the City of Toronto.



4. Repeat steps 2 and 3 to open golf courses (**ONglf_torcity.zip**) and the City of Toronto boundary file (**ONmun_torcity.zip**) layers.

5. Your view should now look something like the image below. **Note:** Your colours may be slightly different as ArcMap 9.x chooses the colours at random when the files are initially opened. The next section will demonstrate how to change these colours.

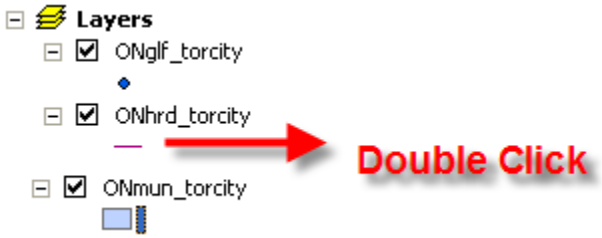


D. Changing the appearance of the newly added layers

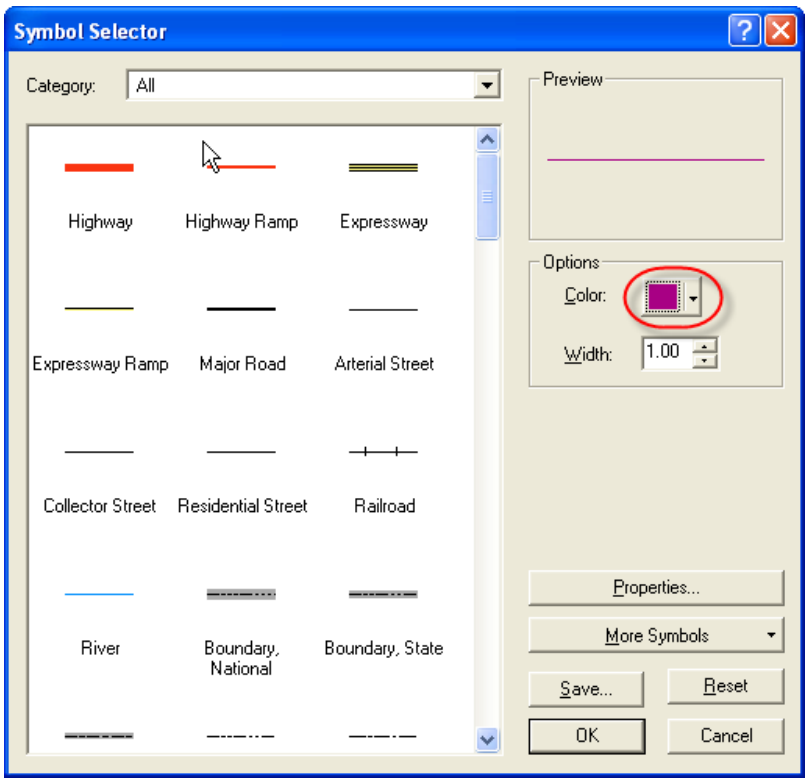
As noted above, ArcMap's colour selection is random, thus there is a probability that the files will open with an undesired colour. Changing the appearance of these layers is very simple.

Lets begin with major roads (**ONhrd_torcity**). Following common cartographic principles, road layers are usually black.

1. In the Layers window, *double click* the **line** representing the road layer.

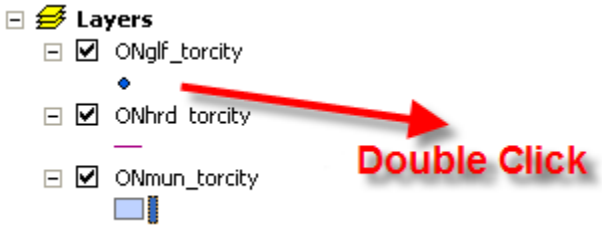


2. In the **Symbol Selector** window you have the option of changing the type, colour, width or advanced properties of the symbol. In this example, we simply want to change the colour of the symbol.
    a. In the **Options** area, *click* the colour pallet and change the colour to black (as shown below). *Click* **OK**.

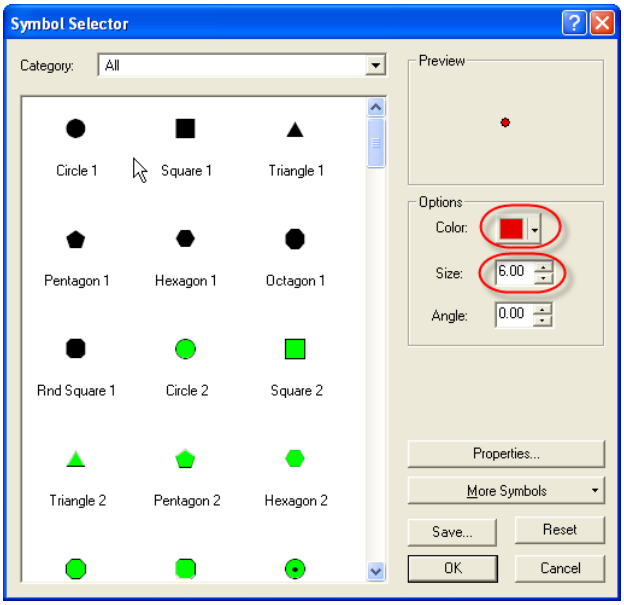


Your roads layer should now be black.

3. Similarly to the roads layer, *double click* on the point (located under the file name **ONglf_torcity.zip**) representing the golf courses symbol.

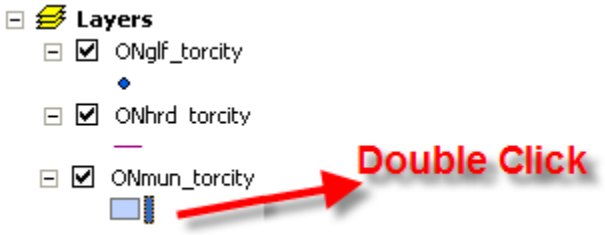


   a. As you may have noted, the points are relatively small. In the **Options** area, change the size to **6** and *click* on the colour pallet and change the colour to red.

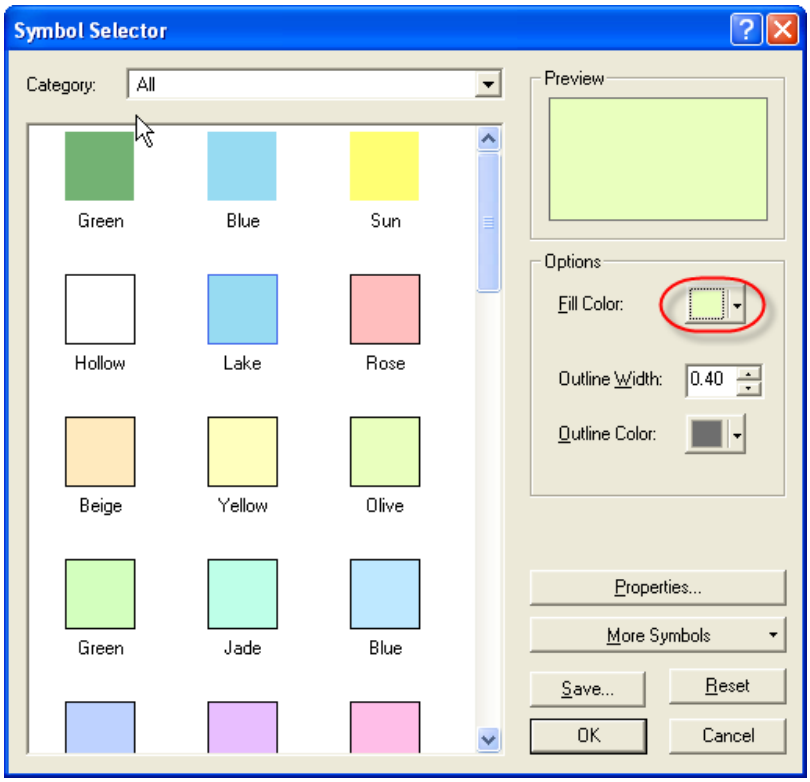


b. *Click* **OK**.

4. Finally, *double click* on the box (located under the file name **ONmun_torcity.zip**) representing the City of Toronto boundary file.

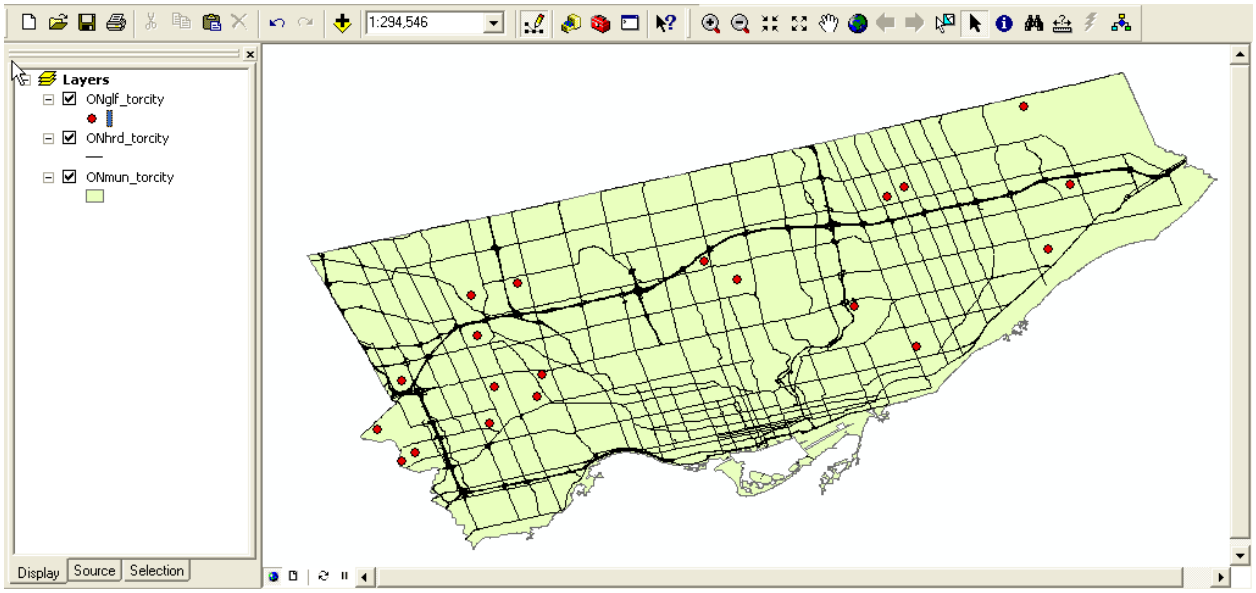


a. In the **Options** area *click* the colour pallet and change the colour to a light green.



b. *Click* **OK**.

If done correctly, your map should look like the image below.

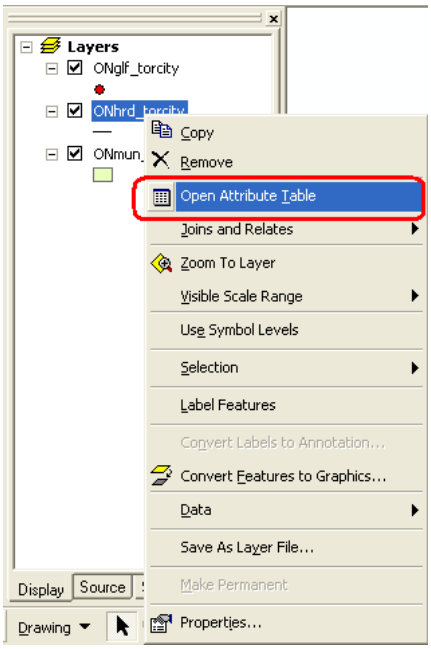


E. Browsing through the Attribute Table

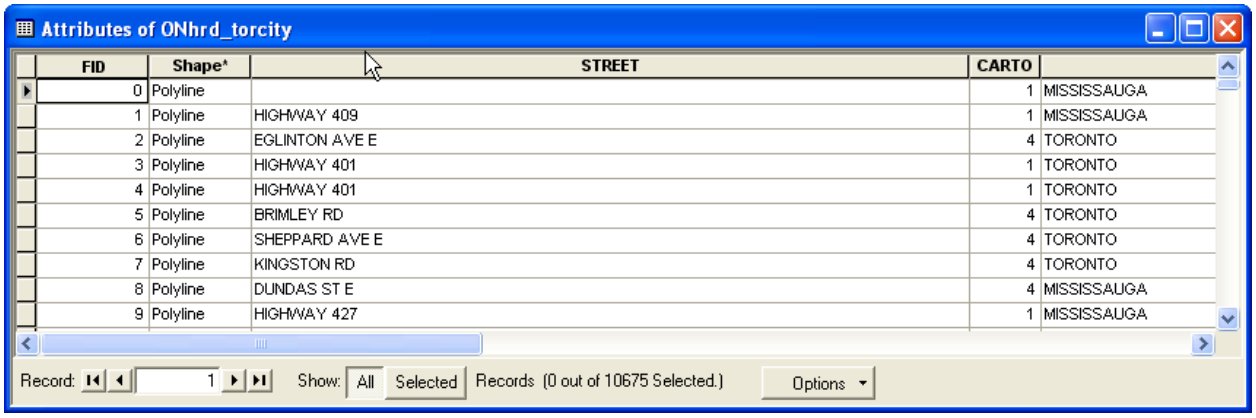
With geospatial data it is very important to make sure that the data you are using is suitable for your project. For example, later on in the project, you may want to search for specific attributes and you may find that none exist. One way to check for missing

data is to browse through the attribute table and make sure that each layer has relevant attribute data. In this section the attributes for the major roads will be browsed.

1. In the **Layers** window, *right click* **Onhrd_torcity** then scroll down and *click* **Open Attribute Table**.



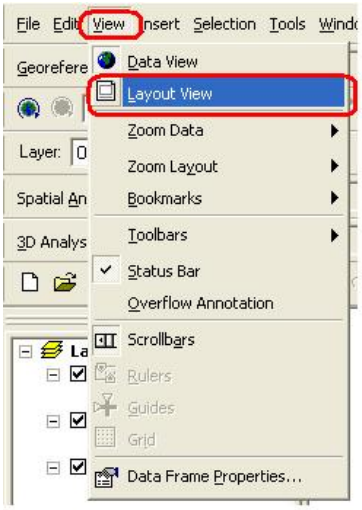
2. As you can see, the attribute table is populated with appropriate data. You can use the scroll bar locate at the bottom of the window to scroll left and right. Once finished viewing the attribute table, close the attribute table window (**Do Not** close ArcMap 9.x).



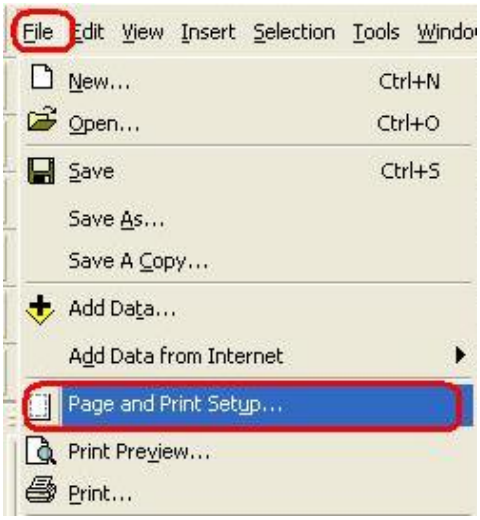
F. Preparing the Layout for Printing or Exporting to PDF and other Formats

Compared to other GIS software, creating a layout in ArcMap is a simple task. The following section describes how to create a basic layout including the fundamental map elements**.**

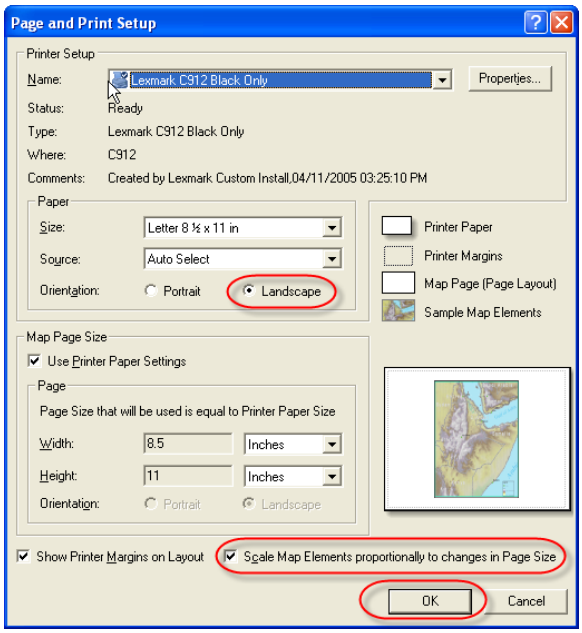
1. To change the View from **Data View** to **Layout View**. *Click* **View** from the main menu and *Select* **Layout View** from the drop down menu.



2. The City of Toronto map is elongated horizontally, thus it would be more appropriate to display the map on a landscape image. From the main menu, *click* **File** then *click* **Page and Print Setup**.

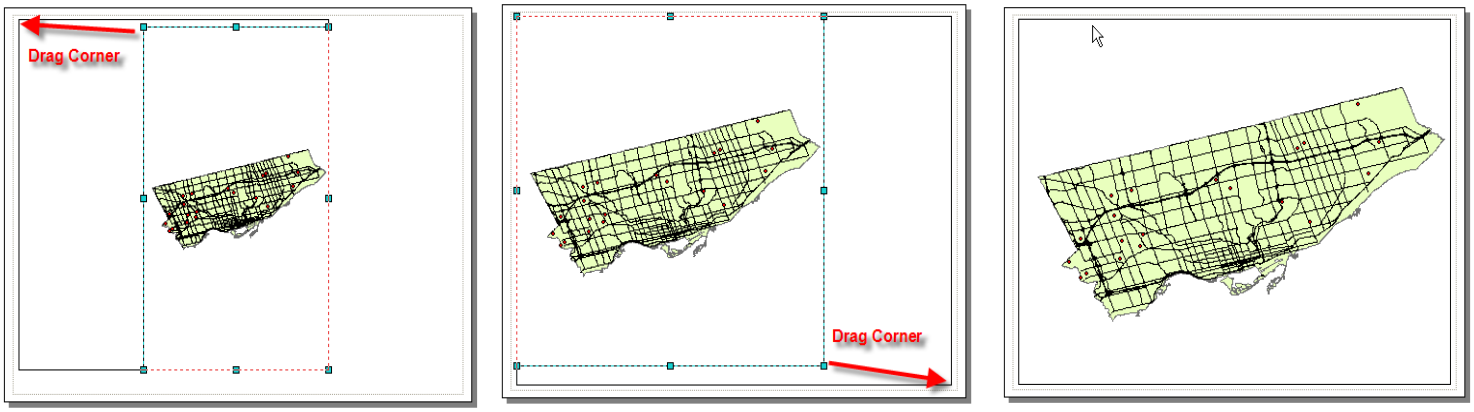


a. In the **Page and Print Setup** window *click on* the **Landscape** radio button and *check on* the **Scale Map Elements** … button. Then *click* **OK**.



You should notice that your layout view has changed to landscape.

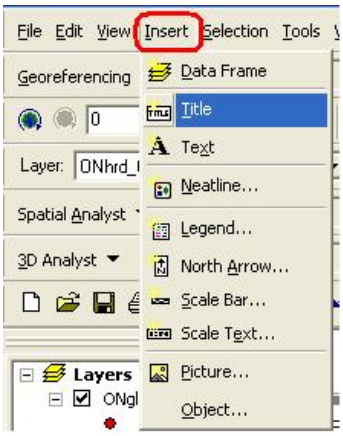
3. Neatline – A neatline is automatically added to the layout view, however, in the previous step we changed the layout to landscape and now the neatline must be adjusted to fit the print layout. In order to do this, grab one of the corners of the neatline and drag it to the corresponding corner of the page layout (**Do not** pull the corner farther than the dotted lines because anything outside of that region will not be printed). Example below.



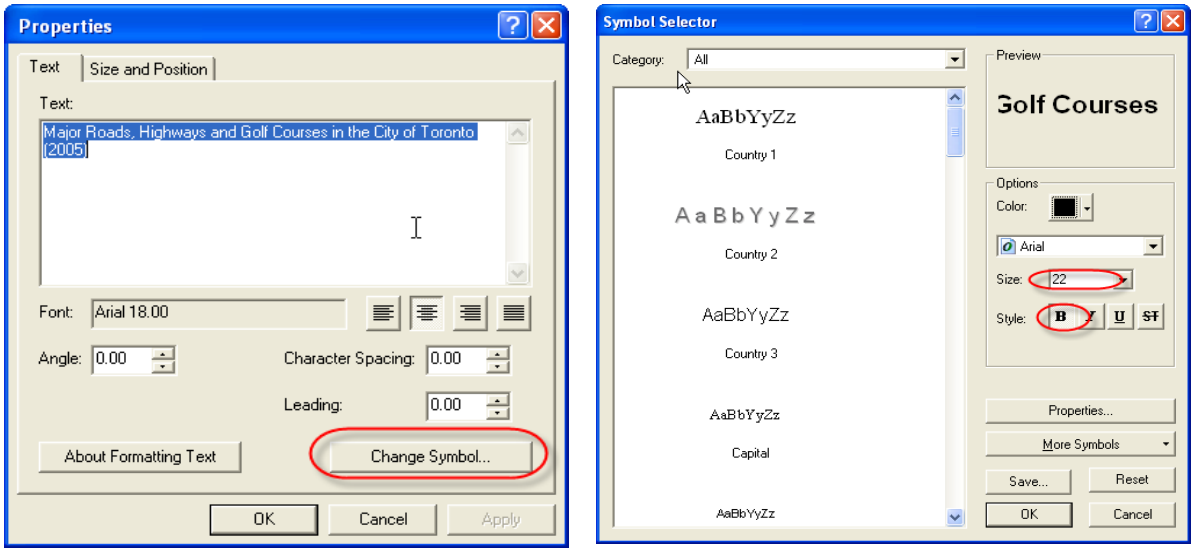
Note: if you would like to add a neatline to other objects in the layout, *click* the object, *click* **Insert** from the main menu, then *click* **Neatline**. The **Neatline** window will appear allowing you to change the properties of the neatline. *Click* **OK**, when you are satisfied with the neatline.

4. *Click* **Insert** from the main menu. In the ensuing drop down menu, you can add a Title, Legend, North Arrow, and Scale Bar. Once inserted into the layout view,

each item can be manipulated by *Double-Clicking* on it. Examples are listed below:



5. Title – *Click* **Insert** from the main menu. Select **Title**. In the **Text** textbox type in the title *Major Roads, Highways and Golf Courses in the City of Toronto (2005)* then push **Enter** on your keyboard. *Double-Click* the Title to open the **Properties** window.

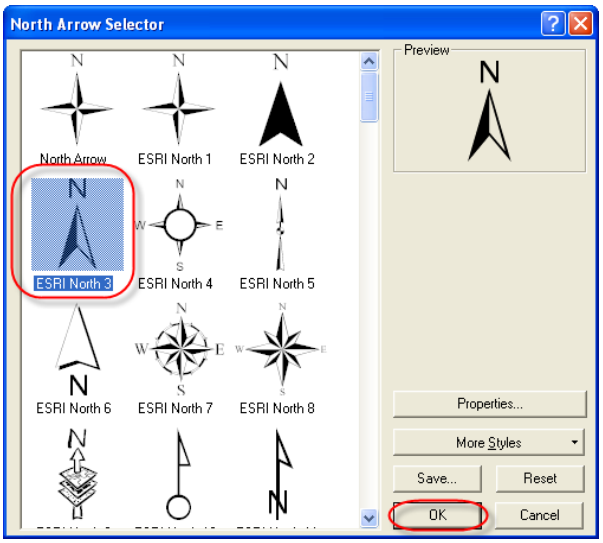


Click **Change Symbol**. In the **Symbol Selector** window, you can change the properties of the text. *Click* the bolded **B** in order to make the text bold. Change the font size to **22**. *Click* **OK**, then *click* **OK** again.

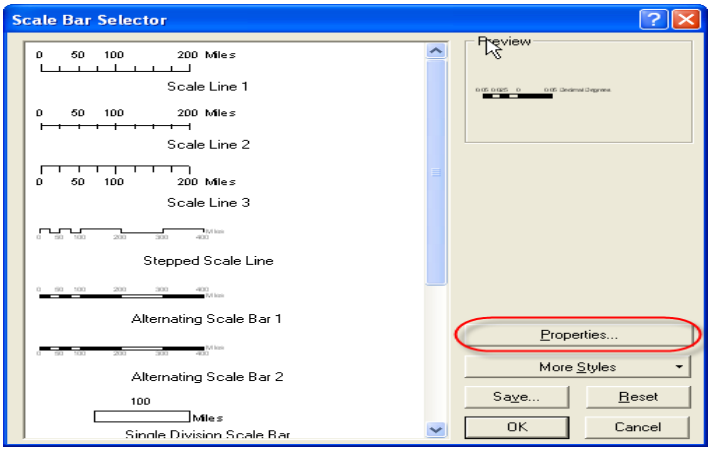
6. Legend - *Click* **Insert** from the main menu. Select **Legend.** The **Legend Wizard** window will appear. *Click* **Next.** Change the legend title if you wish, otherwise *click* **Next**. *Click* **Next** two more times, then *click* **Finish**. *Click* and *drag* the legend from the centre of the layout and move it to the bottom right corner.

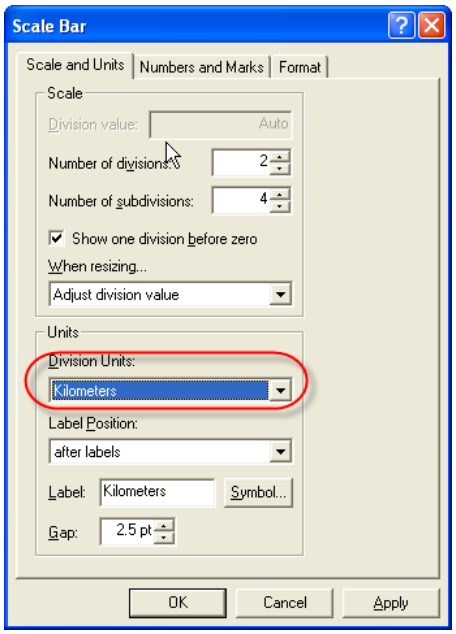
To customize the legend labels, *left click* the appropriate layer in the **Layer** window then wait two seconds and click it again, you should now be able to change the name. Change **ONhrd_torcity** to *Major Roads*, **ONglf_torcity** to *Golf Courses* **and ONmun_torcity** to *City of Toronto.*

7. North Arrow - *Click* **Insert** from the main menu. Select **North Arrow.** In the **North Arrow Selector** window, chose an appropriate north arrow then *click* **OK**. *Click* and *drag* the north arrow from the centre of the layout and move it to the bottom left corner.



8. Scale Bar - *Click* **Insert** from the main menu. Select **Scale Bar.** *Click* **Properties** to open the **Scale Bar** window**.** In the **Division Units** textbox, select **kilometers**. *Click* **OK**. *Click* **OK.** *Click* and *drag* the scale bar from the centre of the layout and move it to an appropriate position below the map.





If done correctly, your map should look like the image

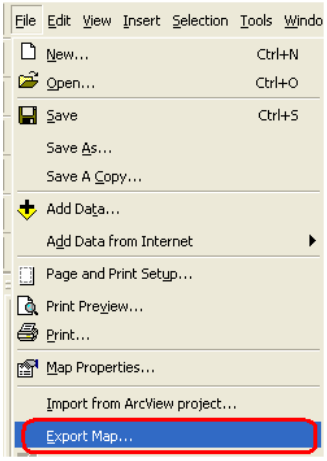
below.

9. To print the map, *Click* **File** from the main menu and *Select* **Print** from the drop down menu. After selecting the appropriate printer and print specifications, *Click* **OK**.

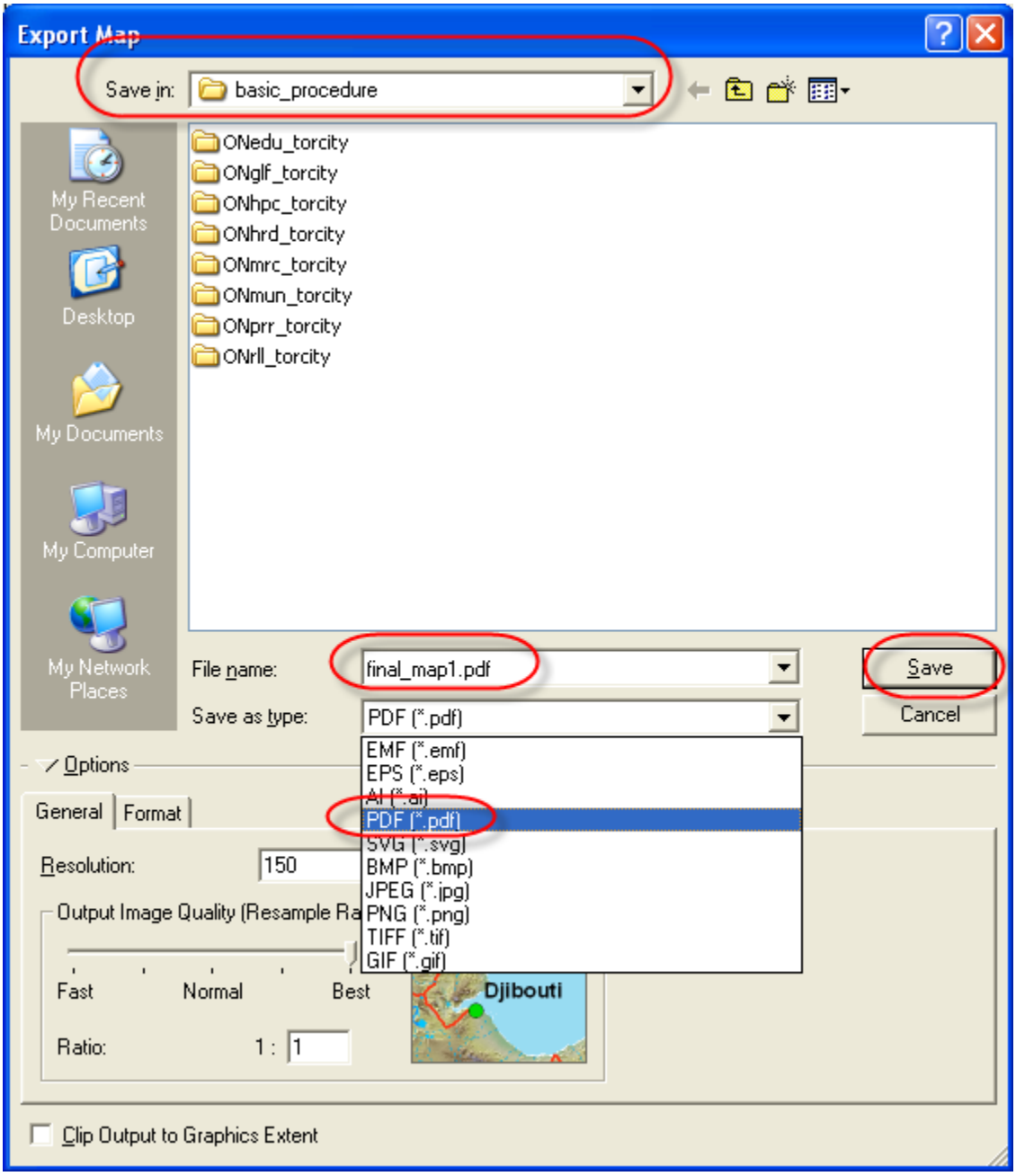
Exporting to PDF or Other Formats

Alternatively, you may opt to export your map and save it for later use rather than printing your map. ArcMap offers a variety of file types that you can save your map as. The following procedure will show you how to export your map, using one of the various file types.

1. Once you have completed S*teps 1* through 8 above or you are satisfied with your map, you may begin the export procedure. *Click* **File** from the main menu and *Select* **Export Map**.



2. The **Export Map** window will open. In the **Save In** window, *browse* to the location that you wish to save your map. In the **File Name** text box, chose an appropriate name for your map. In the **Save as Type** textbox *select* the format that you would like to save your map in.



3. *Click* **Save**.

Appendix A. Setting the Appropriate Projection

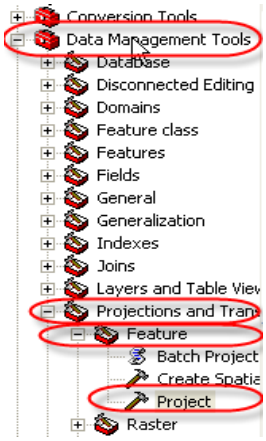
A map projection is any method used in cartography (mapmaking) to portray the surface of the earth or a portion of the earth on a flat surface. Essentially, flat maps could not

exist without map projections. Distortions of conformality, distance, direction, scale, or area always result from this process.

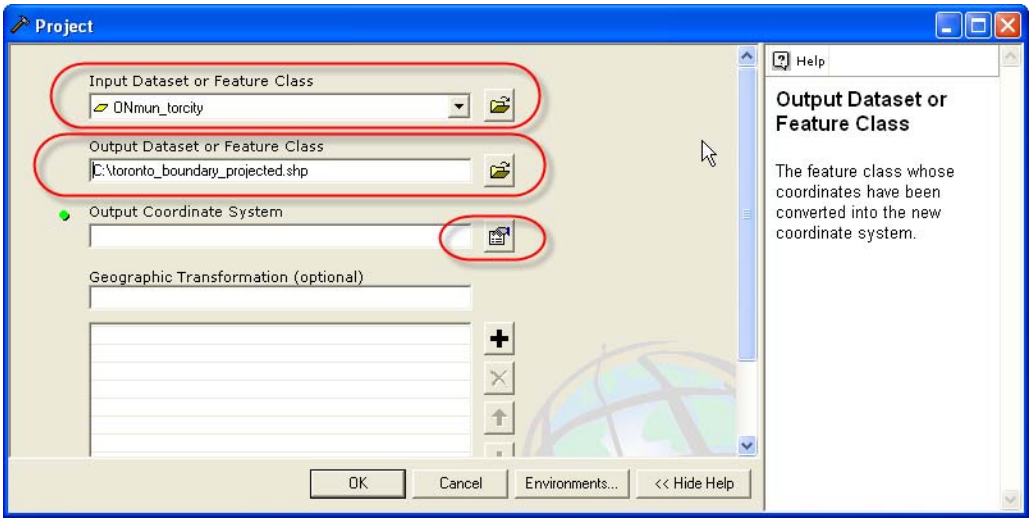
The City of Toronto is generally viewed using the UTM NAD (Universal Transverse Mercator North American Datum) 1983 zone 17 N projection. The files (major roads, golf courses and the City of Toronto boundary file) used in the procedure above were automatically opened in ArcMap 9.x in the unprojected NAD 1983 projection. The following steps will outline how to correctly project the data.

Note: This procedure should be carried out after ArcMap is opened. Follow the steps outlined in section *C: Opening the Spatial Files in ArcMap 9.x* (Steps 1 through 3) to open and add data to your layout view. This procedure should be carried out for all files that you wish to project. In this example, we will correctly project the City of Toronto boundary file.

1. *Click* the **ArcToolbox** button  to open the **ArcToolbox** window.
2. In **ArcToolbox** window *double click* **Data Management Tools** > **Projections and Transformation** > **Feature** > **Project.**

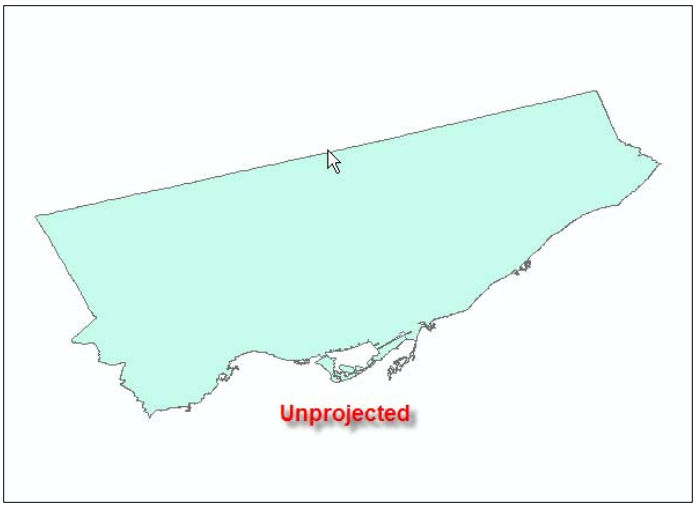


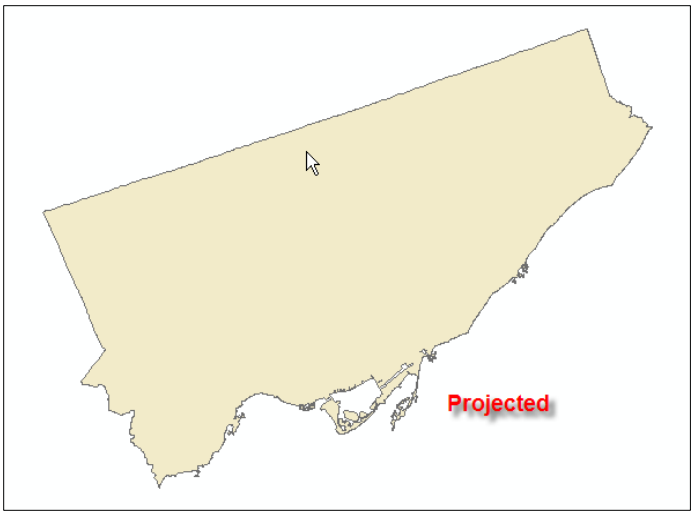
3. In the **Input Dataset or Feature Class** textbox use the small down arrow  or the open folder  button to select the layer you want to project (**ONmun_torcity**).
    a. In the **Output Dataset or Featue Class** window use the open folder button  to browse to an appropriate location to store your projected layer. **Note:** When choosing a name for a file in ArcMap, never use spaces or abnormal characters such as %&*@. If you need to space your words, use the underscore character: "_".
    b. *Click* the **Data Frame Properties** button  **.**



4. In the **Spatial Reference Properties** window *click* **Select**.
    a. *Double click* the **Projected Coordinate Systems** > *Double click* **UTM** > *Double click* **NAD 1983** > *Double click* **NAD 1983 UTM Zone 17N.prj**.
    b. In the **Spatial Reference Properties** window *click* **Apply** then *click* **OK**.
    c. In the **Project** window *click* **OK.**
5. Once the dialog box indicates that the projection transformation has been completed, *click* **Close.**

Your newly projected boundary file will be added to the main data view. Initially there is no difference between the two files because the data frame is still set to the projection of the unprojected boundary file. However, if you close and reopen ArcMap with the newly projected City of Toronto boundary file, you will notice a significant difference as seen below:





May 17, 2006
Noel Damba