

Geo-Referencing

Adding spatial information to your data

This additional document provides some basic information on geo-referencing both spatial and non-spatial points and areas.

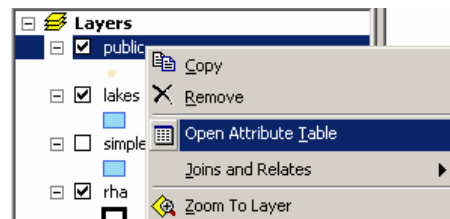
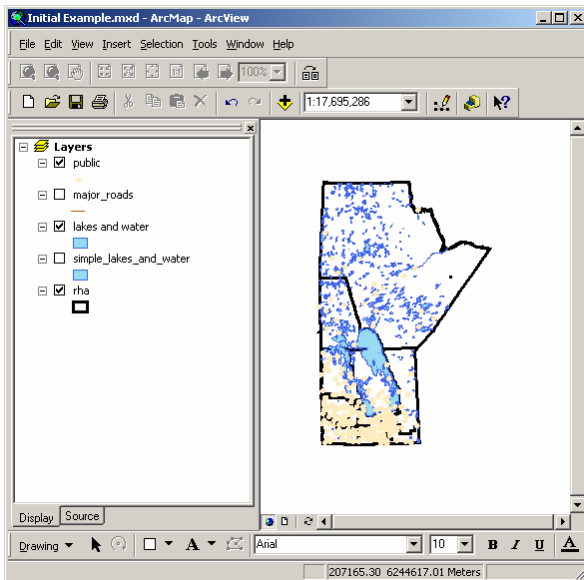
A. Referencing existing spatial data.

This example will show you how to add information from one spatial source to another based on the spatial location of points. If two layers exist you can add attribute information from one layer to the other based on a spatial join.

In this example we will add RHA information to the location of public schools.

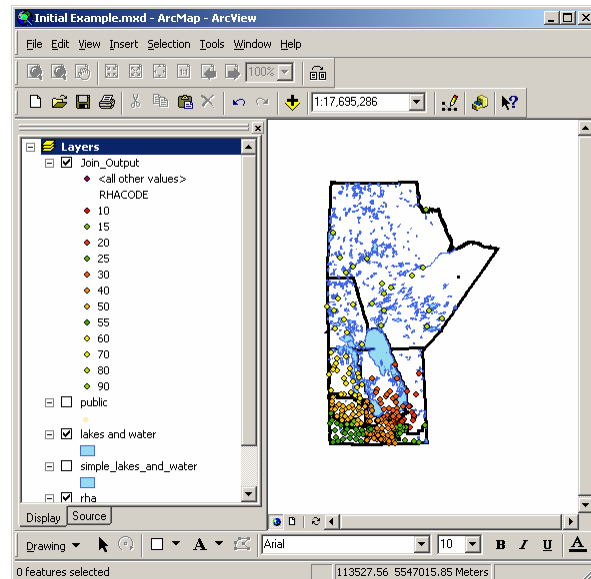
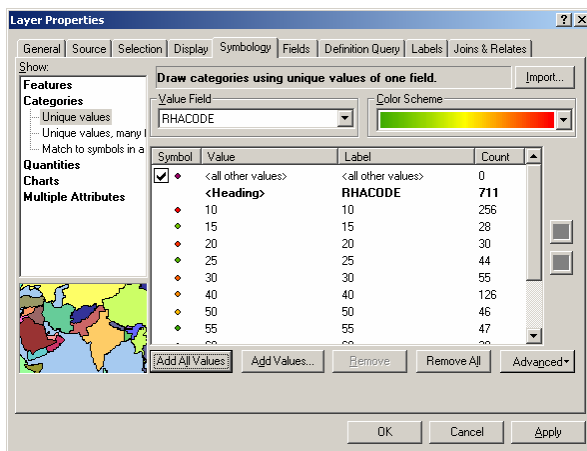
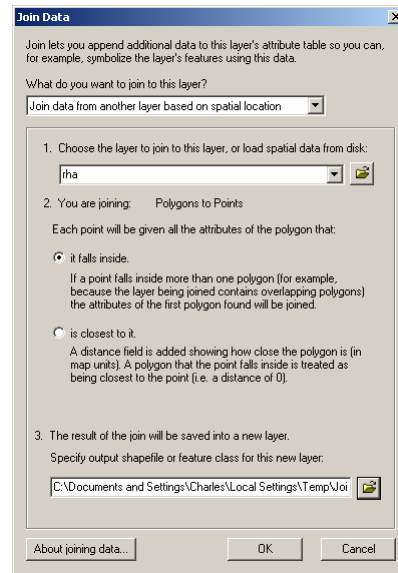
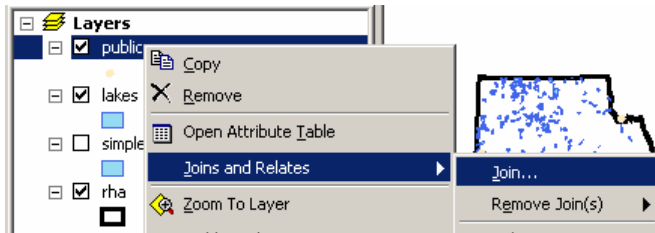
- i. Load the public schools shape file and the RHA boundaries file (d:\gis_course\rha\public.shp, d:\gis_course\rha\rha.shp).
- ii. Preview the attribute table of the schools and the RHAs.
- iii. Add information from the RHA polygons to the public school points using a spatial join. Once you join the data together a new layer containing the join is added to your map.

When working with point data more information along with the joined attributes such as distance from the points or summary information. Be sure you select an appropriate place to put the joined shape file. When joining polygons to polygons the joined information is either for completely contained polygons or summary stats for intersecting polygons – for our work neither of these is usually acceptable. Convert the polygons to centroids then join the polygon information to the new centroid points. Centroids can be calculated using an extension such as X-tools.



FID	Shape	DIVISION	SCHOOL	NAME
0	Point	6	1530	GLENLAWN COLLEGIATE
1	Point	12	1531	HAZELRIDGE SCHOOL
2	Point	1	1280	WESTON SCHOOL
3	Point	5	1281	FORT RICHMOND COLLEGIATE
4	Point	21	1282	GROSSE ISLE SCHOOL
5	Point	21	1283	LIGHTLY SCHOOL
6	Point	25	1284	GRAYSVILLE SCHOOL
7	Point	49	1287	COLLÈGE LOUIS-RIEL
8	Point	11	1288	WILLIAM S. PATTERSON SCHOOL
9	Point	25	1289	ELM CREEK SCHOOL
10	Point	35	1535	MINITONAS SCHOOL
11	Point	1	1537	SARGENT PARK SCHOOL
12	Point	9	1538	JOHN HENDERSON JUNIOR HIGH
13	Point	24	1539	MICHAEL J. O'NEILL SCHOOL

- iv. Open the properties for the new joined layer and change the symbology to show the RHA codes for each school.



B. Referencing non-spatial data

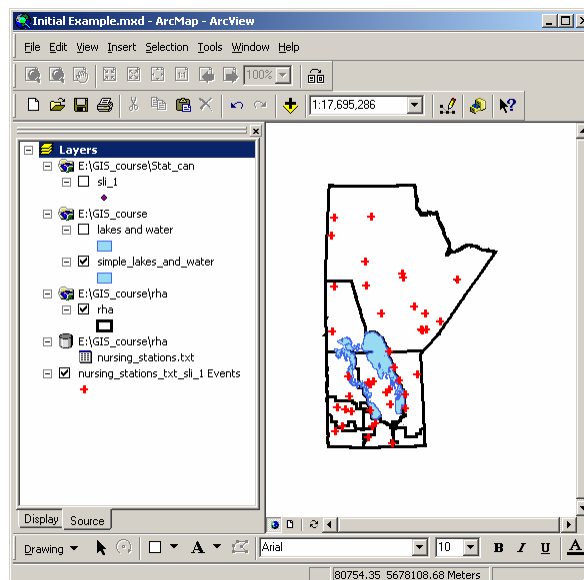
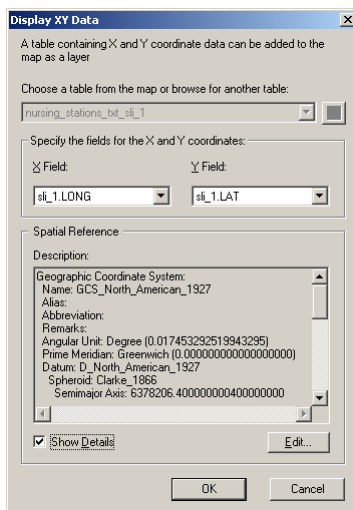
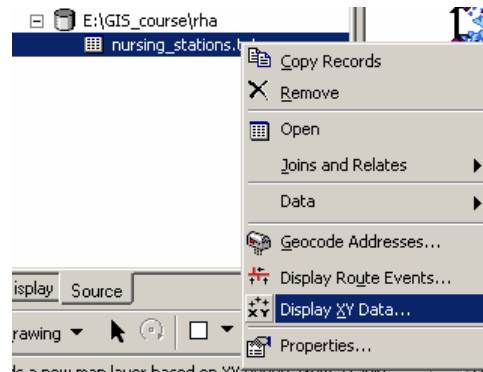
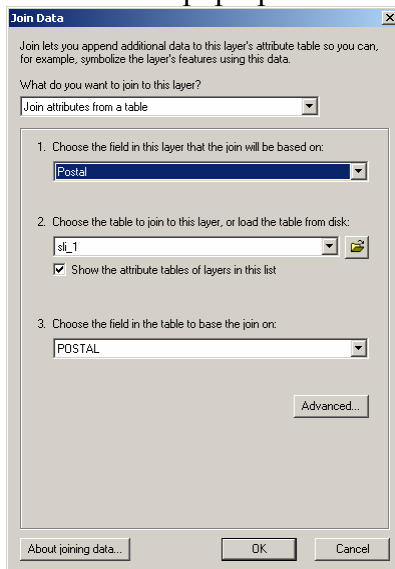
i. Using simple joins between tables

In this case we will geo-reference Nursing Stations in Manitoba using the associated community postal code. In this example we will add the source files for nursing stations and postal code locations from Statistics Canada. This is one of the most common forms of geo-referencing that we use at MCHP. There are some issues with using the PCCF file that need to be considered. In general we use only the current records (see birth/retire dates) with the single link indicator with a value of '1'. In all cases a manual review should be done of all of the points since there are some location problems with a few of the postal codes from rural towns and municipalities (e.g. in recent PCCF files Beausejour postal codes are located in the RM of St. Clements near the Brokenhead reserve).

- Add the Nursing Stations.txt file and preview the attribute table (d:\gis_course\rha\nursing_stations.txt).
- Add the SLI_1 table based on the Statistics Canada PCCF file. This file provides the most likely location based on population of each postal code in Manitoba in 1998 (d:\gis_course\stat_can\sli_1.dbf).
- Join the PCCF data to the Nursing stations data based on postal code. Use the join option under the Nursing stations pop-up menu.



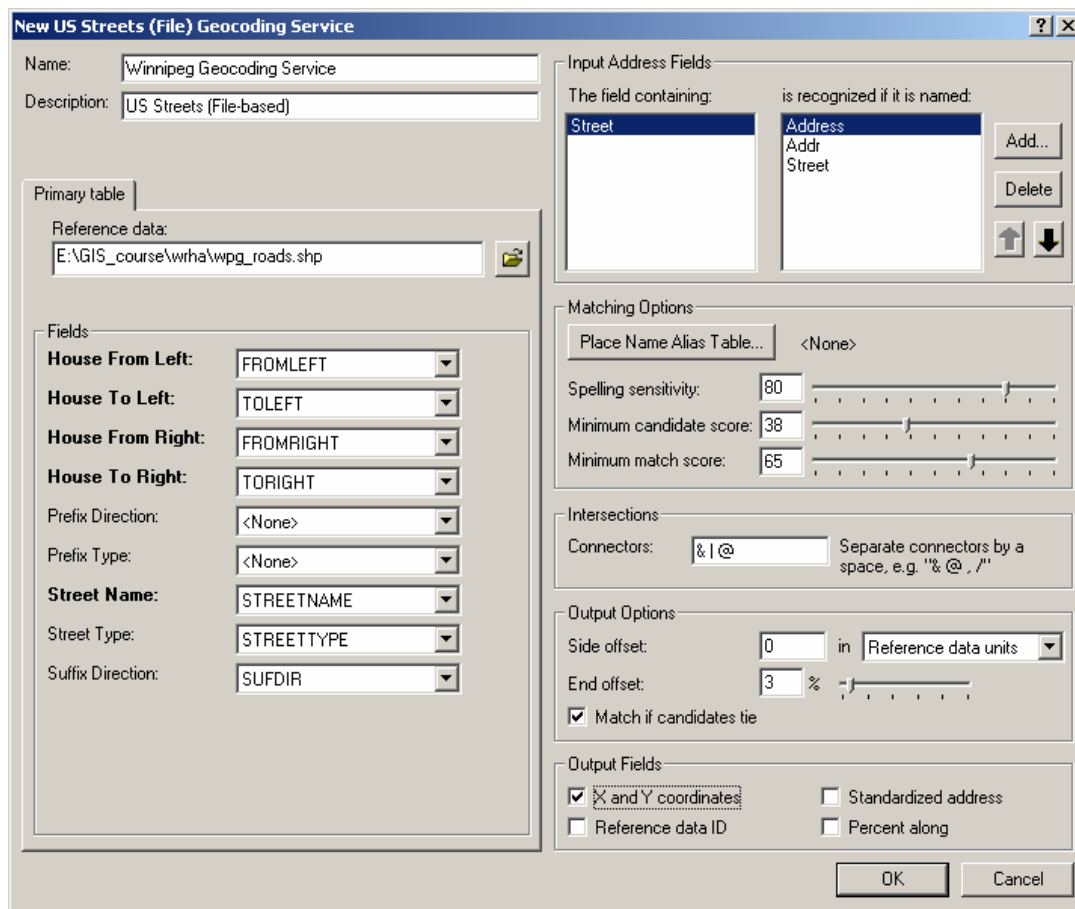
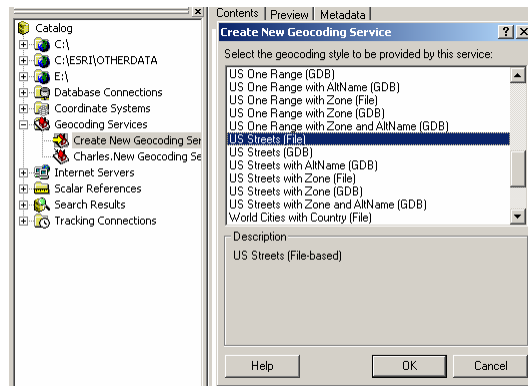
- Add the Nursing Station locations to the data using the 'Display X/Y data' option under the pop-up menu or from the tools menu.



ii. Geo-coding location based on addresses

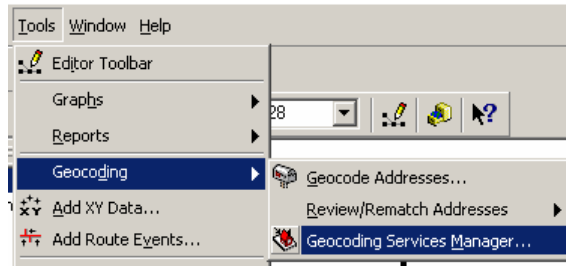
If you have a full street address you can geo-code points using a street network file. The first thing that you will need to do is locate a street network file. Then index the file for geocoding in ArcCatalog. Once the Geocoding Service is setup the index can be added to a map for use.

- a. In ArcCatalog define a new Geocoding Service based on the Winnipeg Roads file using the 'US Streets' definition (d:\gis_course\wrha\wpg_roads.shp). This will generate an index file of the appropriate format that can be used in geocoding.

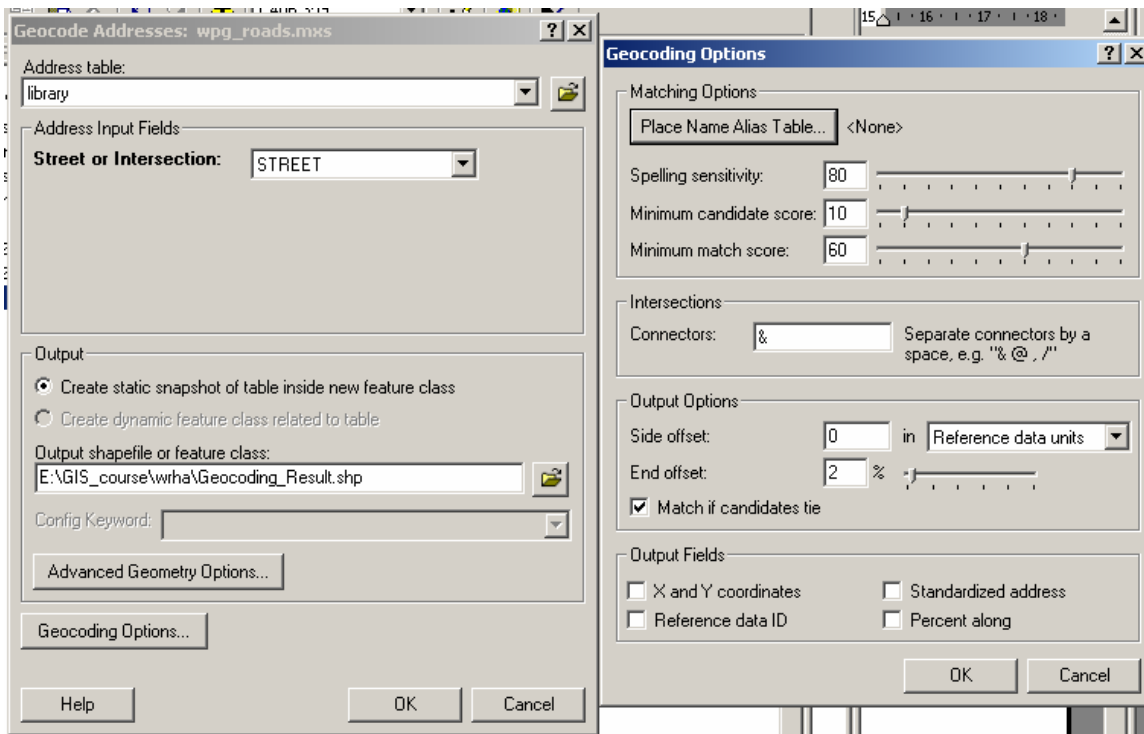


- b. In this example you will need to create a map of Winnipeg, including the Winnipeg and neighbourhood boundaries, and the Winnipeg Roads file

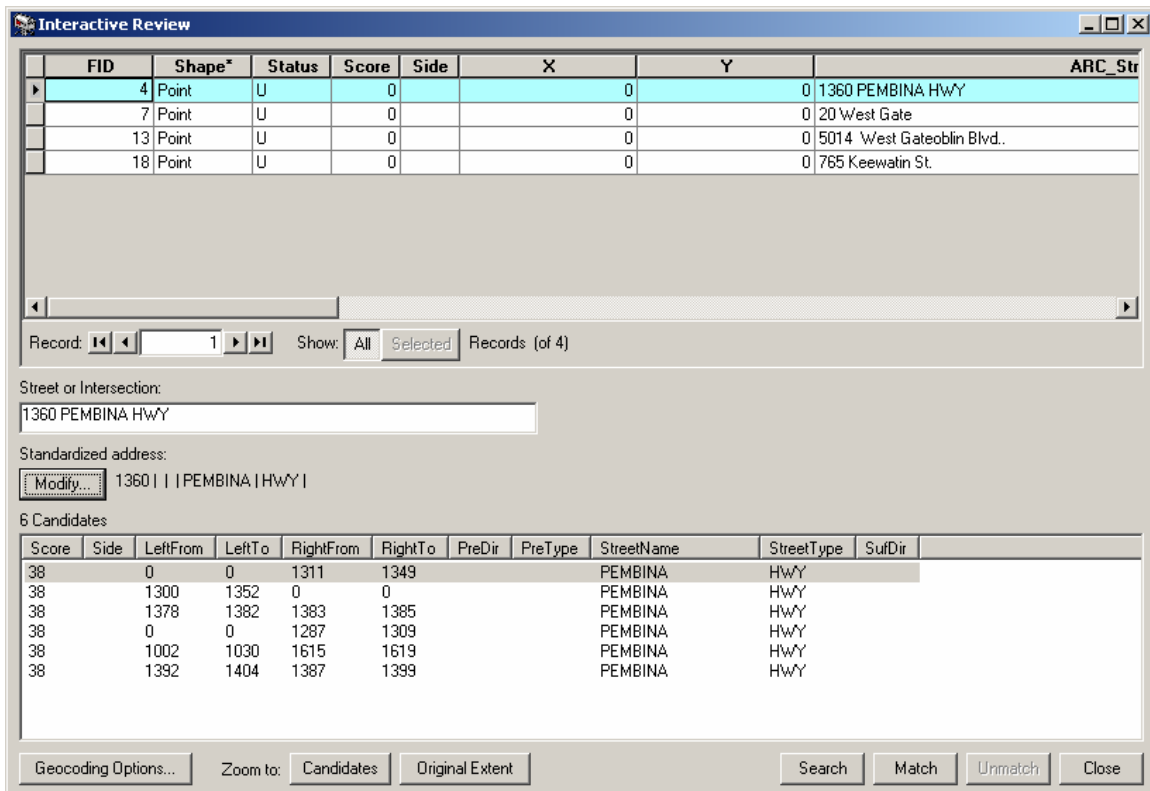
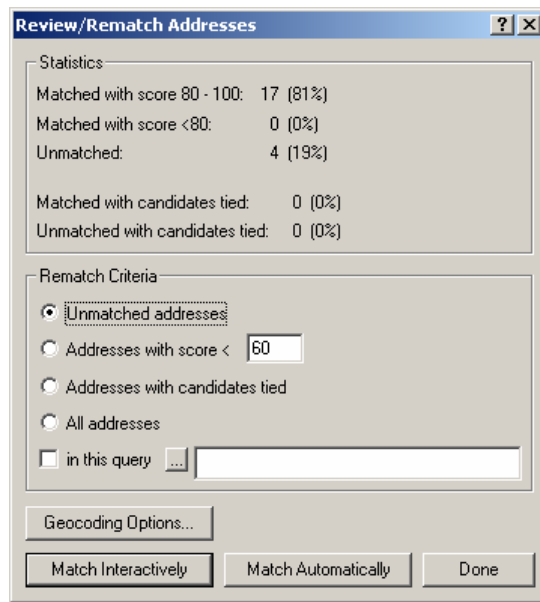
- (d:\gis_course\wrha\wpg_bound.shp, d:\gis_course\wrha\12regions.shp, d:\gis_course\wrha\wpg_roads.shp).
- Add the Winnipeg Libraries data file to the map as well (d:\gis_course\wrha\library.dbf). Preview the attributes table and note that there is a street address as well as a postal code.
 - Define the geocoding service within the map that you want to use.



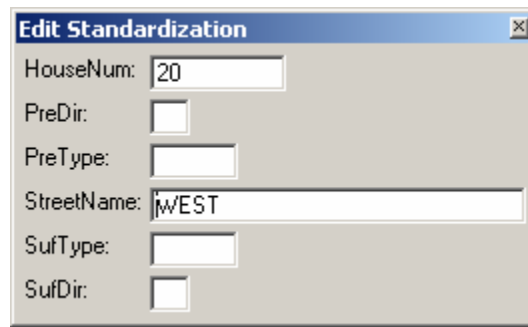
- Select the file that you want to geocode and identify the appropriate options of interest. This will include the address field and the sensitivity (Geocoding Options).



- After the setting the starting options run the first pass (OK). You will get the results of the geocoding process and be given the opportunity to interactively match any remaining items.



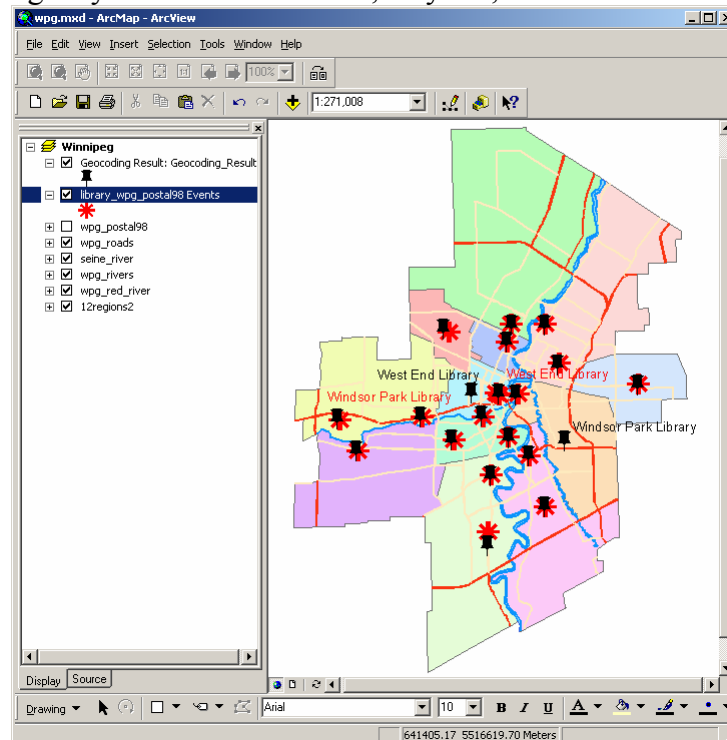
In this example West Gate was not found. ArcGIS assumed that West was a prefix indicating the direction (e.g. East/West/North/South) and not part of the actual name. In the actual file Gate is the street type and West is the name. By selecting 'Modify' you can adjust the name standard and find the correct location in the map. This is often an iterative process between the file name, electronic file, and physical maps. In some cases the actual address can not be found but a 'close' address can be used instead. Put the address at the close point then edit the shape file manually later if necessary.



After geocoding addresses you can always go back to the last session and continue the session. This allows you to stop and check addresses, locations, etc... then complete the task at a later time.



- g. If possible you should try to verify the geocoding results using an alternative source of information (e.g. local knowledge/ground truthing, postal codes, etc...). Run a final test using the postal code location (PCCF) information for each library. Do both sources give you the same location, why not, which is correct?



- The Windsor Park Library is correctly located using the street address but incorrectly using the postal code location.
- The West End library is correctly located using the street address but incorrectly using the postal code location.
- The Pembina Trails and Sir William Stephenson libraries are in slightly different locations.