

## Geocoding a dataset in ArcGIS 9.x

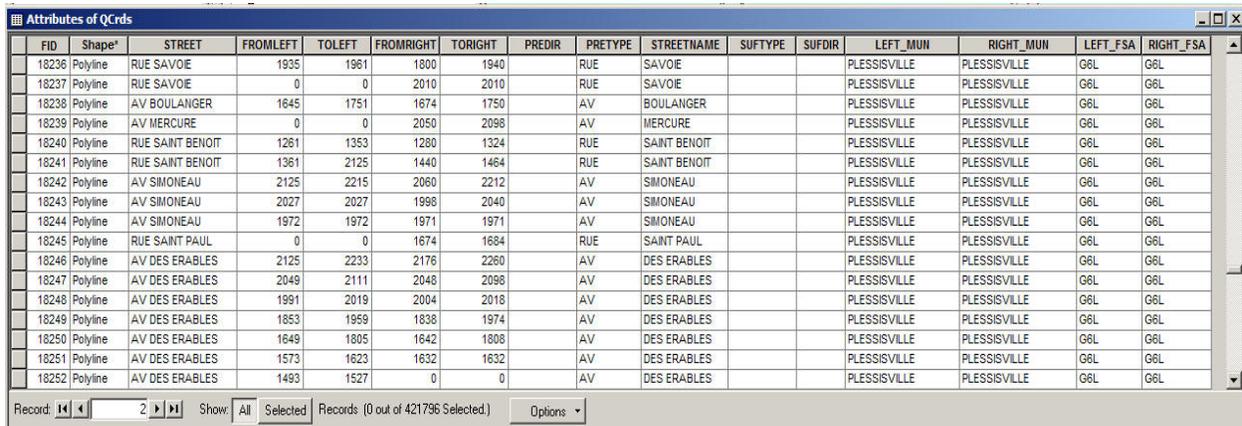
Geocoding is a capability found in ArcGIS that creates points to pinpoint exact locations of addresses on a map. If you want to plot a series of addresses on a map, the shapefile must first be geocoded.

Requirements:

- ArcGIS 9.x
- Detailed spatial data:

For a reference map (i.e. a street map) to have geocoding capability, it must be detailed enough and have a relatively standard attribute table. The table must contain columns with the following attribute information (although they can have different field names):

House From Left	FROMLEFT
House To Left	TOLEFT
House From Right	FROMRIGHT
House To Right	TORIGHT
Prefix Direction*	PREDIR
Prefix Type*	PRETYPE
Street Name	STREETNAME
Street Type*	SUFTYPE
Suffix Direction*	SUFDIR



FID	Shape*	STREET	FROMLEFT	TOLEFT	FROMRIGHT	TORIGHT	PREDIR	PRETYPE	STREETNAME	SUFTYPE	SUFDIR	LEFT_MUN	RIGHT_MUN	LEFT_FSA	RIGHT_FSA
18236	Polyline	RUE SAVOIE	1935	1961	1800	1940		RUE	SAVOIE			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18237	Polyline	RUE SAVOIE	0	0	2010	2010		RUE	SAVOIE			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18238	Polyline	AV BOULANGER	1645	1751	1674	1750		AV	BOULANGER			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18239	Polyline	AV MERCURE	0	0	2050	2098		AV	MERCURE			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18240	Polyline	RUE SAINT BENOIT	1261	1353	1280	1324		RUE	SAINT BENOIT			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18241	Polyline	RUE SAINT BENOIT	1361	2125	1440	1464		RUE	SAINT BENOIT			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18242	Polyline	AV SIMONEAU	2125	2215	2060	2212		AV	SIMONEAU			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18243	Polyline	AV SIMONEAU	2027	2027	1998	2040		AV	SIMONEAU			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18244	Polyline	AV SIMONEAU	1972	1972	1971	1971		AV	SIMONEAU			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18245	Polyline	RUE SAINT PAUL	0	0	1674	1684		RUE	SAINT PAUL			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18246	Polyline	AV DES ERABLES	2125	2233	2176	2260		AV	DES ERABLES			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18247	Polyline	AV DES ERABLES	2049	2111	2048	2098		AV	DES ERABLES			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18248	Polyline	AV DES ERABLES	1991	2019	2004	2018		AV	DES ERABLES			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18249	Polyline	AV DES ERABLES	1853	1959	1838	1974		AV	DES ERABLES			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18250	Polyline	AV DES ERABLES	1649	1805	1642	1808		AV	DES ERABLES			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18251	Polyline	AV DES ERABLES	1573	1623	1632	1632		AV	DES ERABLES			PLESSISVILLE	PLESSISVILLE	G6L	G6L
18252	Polyline	AV DES ERABLES	1493	1527	0	0		AV	DES ERABLES			PLESSISVILLE	PLESSISVILLE	G6L	G6L

\*These fields are not absolutely necessary but strongly recommended

The fields shown are only basic, but sufficient for geocoding small amounts of address data in a city/town. In this guide, this is the case. More attribute fields like Zone, Alternative Names, or

Postal/Zip Code may be required for larger projects spanning cities, provinces/states, or countries.

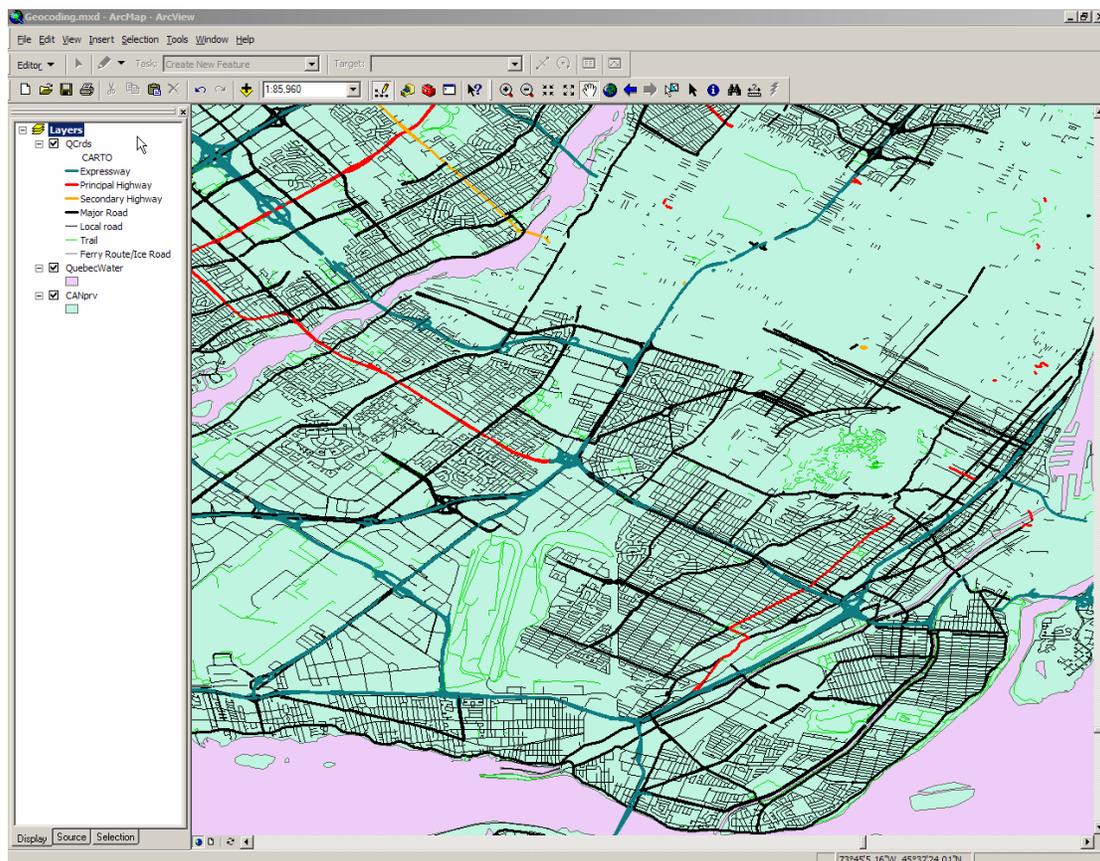
Pre-existing digital maps with the right attributes may be found through spatial data providers (i.e. DMTI CanMap Street Files) or governmental agencies (Census Of Canada, 1996: Geographic and Reference Files).

Procedure:

1. Add reference map and basemap layers to ArcMap.

NOTE: Clip the raw maps to the specific area which you want to geocode. The downloadable digital maps cover large areas and require huge amounts of storage space.

[If you are not familiar with clipping maps, *Getting to Know ArcGIS, 2<sup>nd</sup> Ed.* (available on a three-hour loan at the GIC) has a good tutorial. An easy shortcut is to select the area you want by drawing a box with the Select Features tool. Right click on the layer in the Table of Contents. Under Selection, choose “Create Layer from Selected Features. Right click on the new layer and choose Data→Export Data. You can now add this new shapefile to your project.]

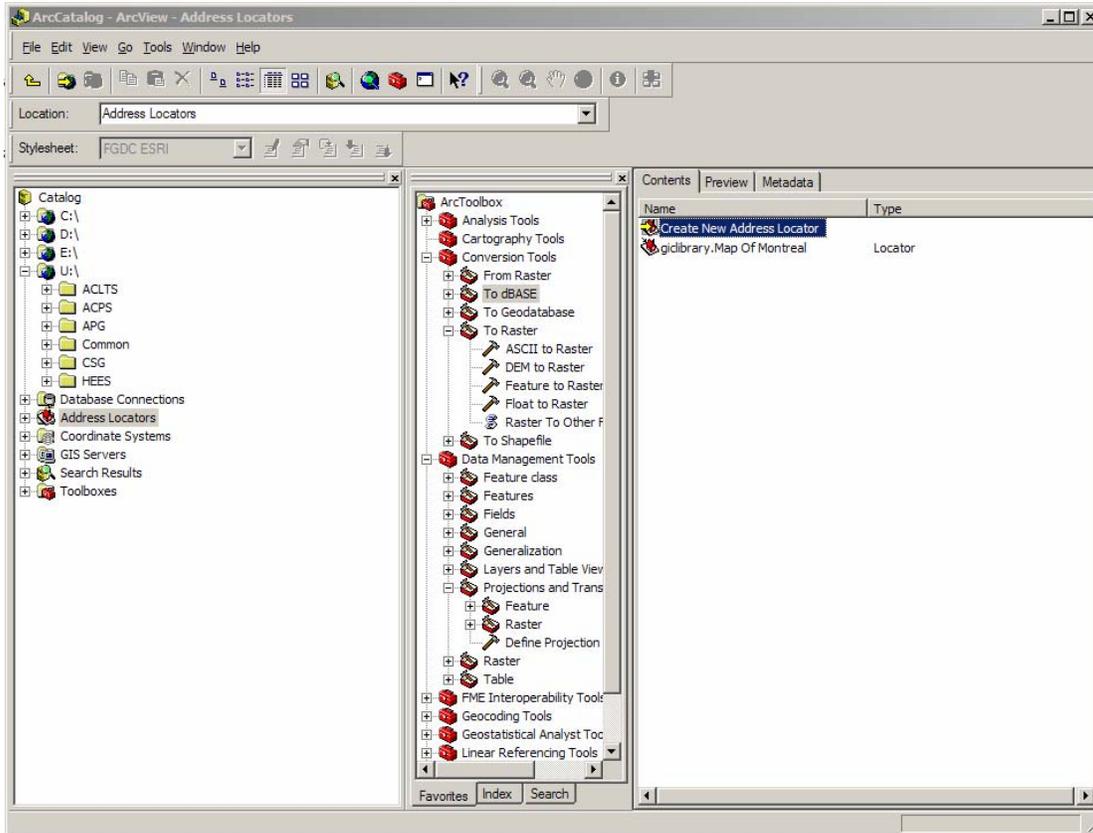


2. Enable the geocoding capability of a reference map. To do so, click on the ArcCatalog button



to open ArcCatalog.

3. Double click on Address Locators in the catalogue tree and then click Create New Address Locator on the main screen.



4. In the newly opened Create New Address Locator Style Window, select a locator style. A locator style determines how the address will be matched, meaning the attributes of the referencing map being used. The word in brackets show which type of file that the map must be in to use this style: File stands for Shapefile and GDBS stands for Geodatabase. This guide will use the locator style "US Streets (File)". Click OK.



A new window, i.e. US Streets (File) Address Locator window, will open.

5. Give a name for this Address Locator in the Name box.
6. Change the Description for this Address Locator, if necessary, in the Description Box.
7. Locate the reference map file in the "Reference Data:" box using the Browse button.

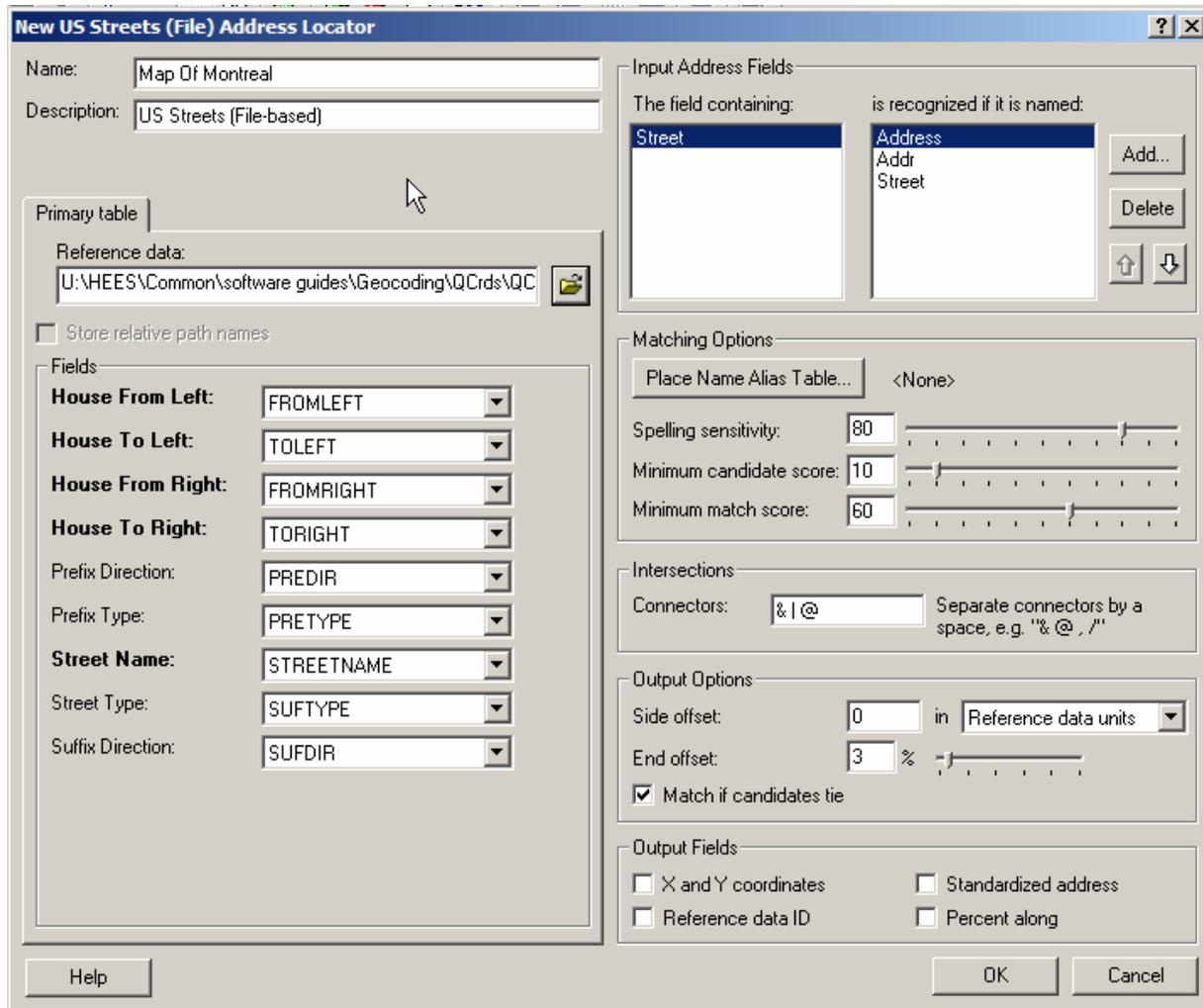
In the Field section, select a field from the reference map's attribute data to be used for each property. For example, if the attributes used to determine Prefix Type is under the field called PRETYPE, select PRETYPE in the Prefix Type Box.

The Input Address Fields concern information about the table which the addresses will be matched to the reference map, i.e. an address table to be geocoded onto the reference map. In the box under "The field containing:" are field types that will be matched to the reference map.

Under the label "is recognized if it is named:" are field names for that field type. For example, addresses will be taken from fields named "Address", "Addr", or "Street". Attributes under any of these field names in any table can be used to match locations in the reference map. To add, delete, or change the field names, first click on the field type, then make changes using the buttons on the right.

"Matching Option", "Intersections", "Output Options", and "Output Field" have additional properties that can be changed or left as default.

8. Click OK.



On the main window of ArcCatalogue, a new address locator with name format username.AddressLocatorName can be seen.

### Locating Addresses:

Now that the geocoding of the reference map is complete, it is possible to find addresses on the map.

Under the Tools menu, select Geocoding/Address Locator Manager.

When the Address Locator Manager Window opens, find that address locator that was created for the reference map. If it does not show up, click the Add button and manually find and add the address locator to the list. Select the address locator and click Close.

## Locating a Single Address:

To locate single addresses, the find button  is sufficient.

Once the button is clicked, a Find window will pop up, click on the Addresses heading.

In the "Choose an address locator:" box, find the geocoding file that was created earlier. It should be under the hierarchy Catalogues\Address Locators.

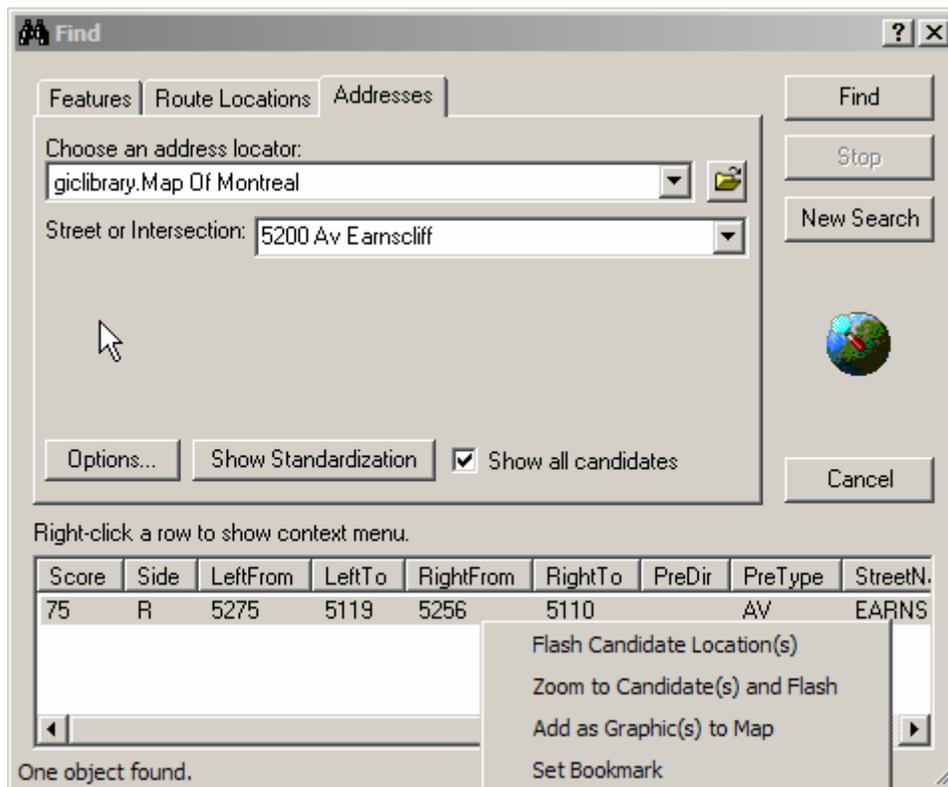
Type in an address or addresses in the "Street or Intersection:" box. Remember to indicate intersections by the symbols chosen earlier in the Address Locator Window. If unsure, it can always be viewed or changed by clicking the Options button.

Click the Find button to begin matching.

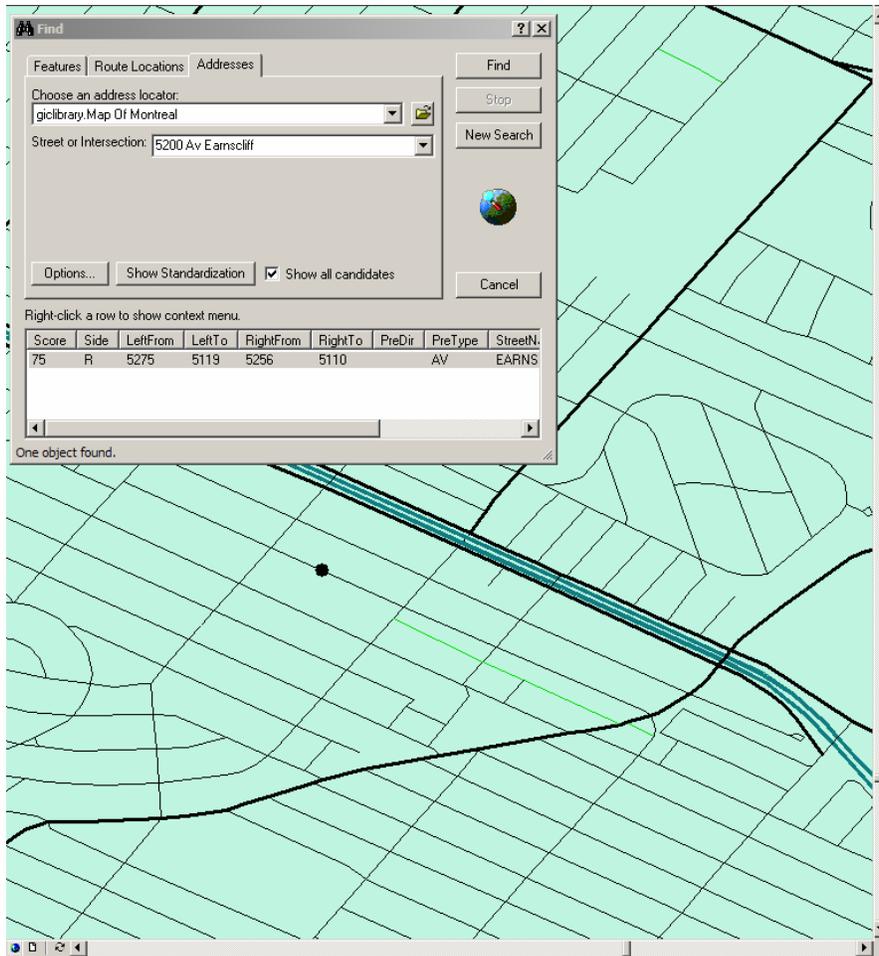
A list of matches will be displayed, in the order of decreasing match score.

Right click anywhere in the display box to display options.

There are four options of marking the location. The location can be flashed, zoomed then flashed, put on the map as a graphic (a dot), or be bookmarked.



Address can be added as a point to the map.



**Locating multiple addresses:**

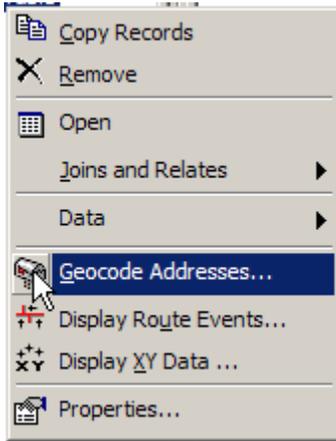
To locate multiple addresses, ArcMap has the capability to create a point layer matching all the addresses in a table to the reference map. Therefore, it is useful to have addresses in a table format.

To proceed, add the table to the project.

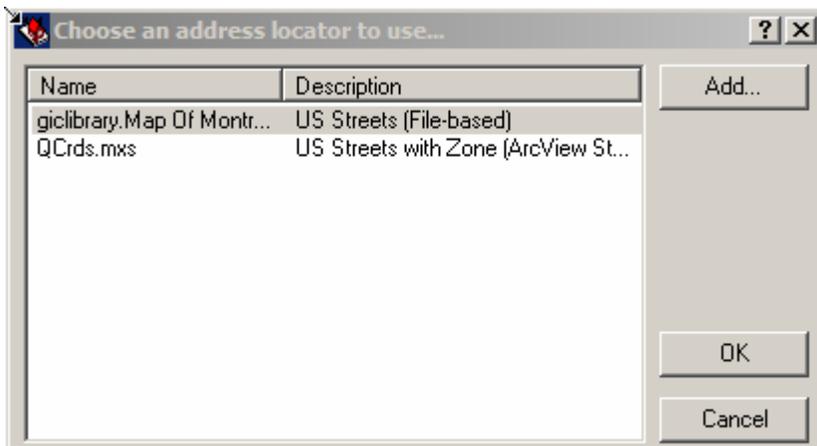
Attributes of AddressTable		
Name	Address	InvitationReply
Ashley Fernes	1920 Boul Laird	Yes
Kathleen Richards	372 Rue Bleinier	Yes
J.D. Andrews	6919 Rue St Hubert	No
Tammy Hseung	7789 Ch Guelph	Unknown
Gregory Brown	726 4 Av	Yes
Tom Wilson	2198 Rue Menard	No
Rene Reeds	5650 Rue Sherbrooke W	Yes
Moira LeBlanc	615 Rue De Courcelle	Yes
James T. Reids	4560 Saint Antoine	Yes
Elliot Scott	6223 Boulevard Monk	Yes
Rita Watson	2750 Rue Sainte Catherine O	Yes
James L. Roal	5673 Ave Melling	No
Reilly Fernes	4440 Boul Décarie	Yes
Peter Callaghan	5698 Av Einstein	Unknown
Grody Luccini	419 Mount Stephen	No

Record: 1 | Show: All Selected | Records (0 out of 15 Selected.) | Options

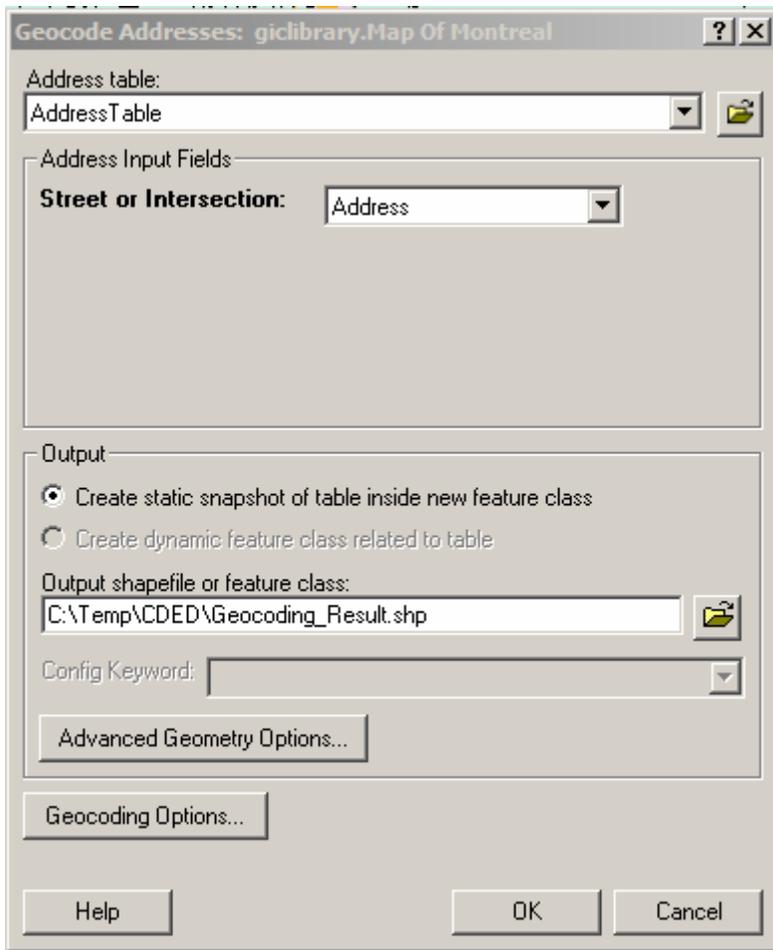
Click on the Source tab at the bottom of the Table of Contents window, then right click on the newly added table, and select Geocode Addresses.



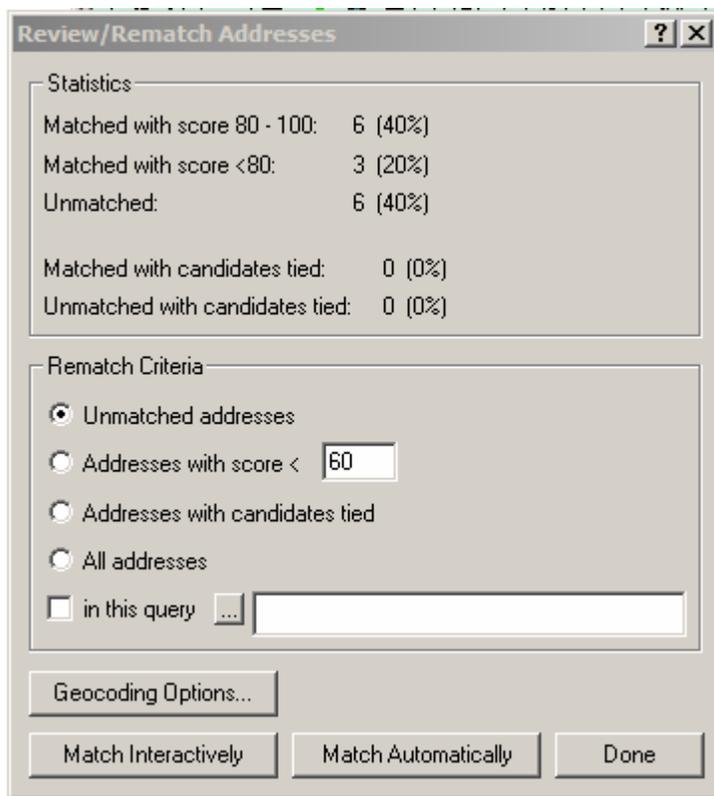
A window will open that chooses address locators to use, find the address locator that was created for the reference map. If it does not show up, click the Add button and manually find and add the address locator to the list. Select the address locator and click OK.



Accept most of the default settings of the Geocode Addresses window, except:  
Address Input Fields: this section select a field in the address table to match parameters to the reference map's attribute table, change the field if the default is wrong.  
Output shapefile or feature class: this box determines the locations of the newly created layer file. Click on the Browse button beside the box to rename or relocate the file.  
Click OK.

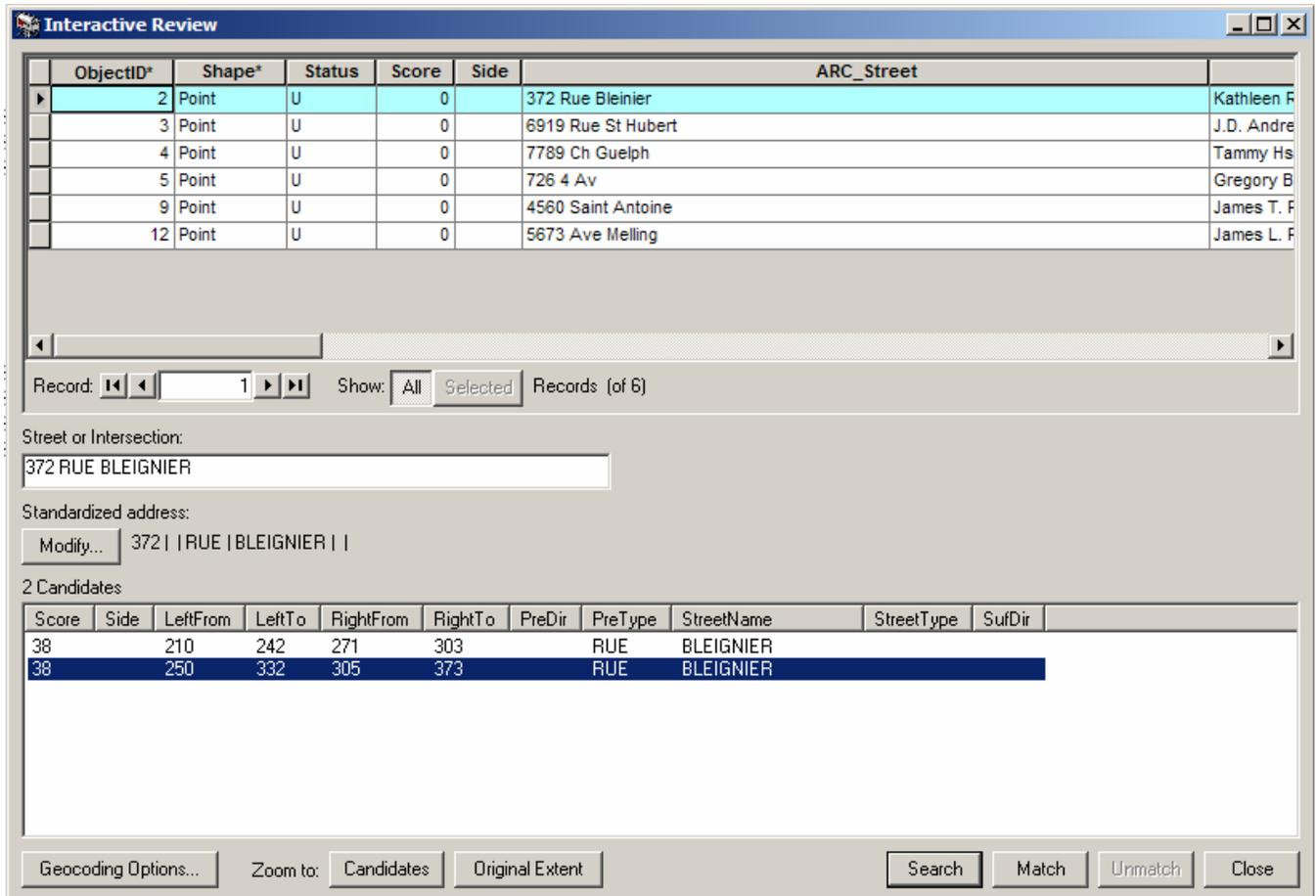


A matching statistics shows how many matches have been successfully matched. Rematching can be done again and the matching parameters such as Spelling Sensitivity, Matching Scores, and Candidate Score can be adjusted by clicking the Geocoding Options button.

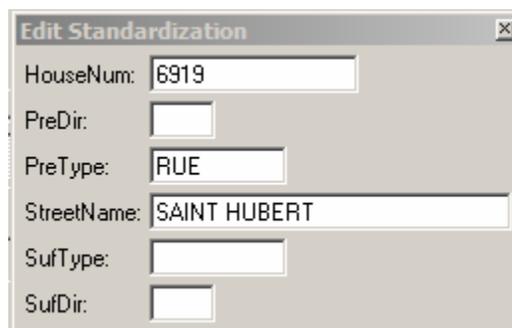


You will have to manually match those that still have not been matched. To do so, click on Match Interactively. A new window will open to start matching all unmatched records.

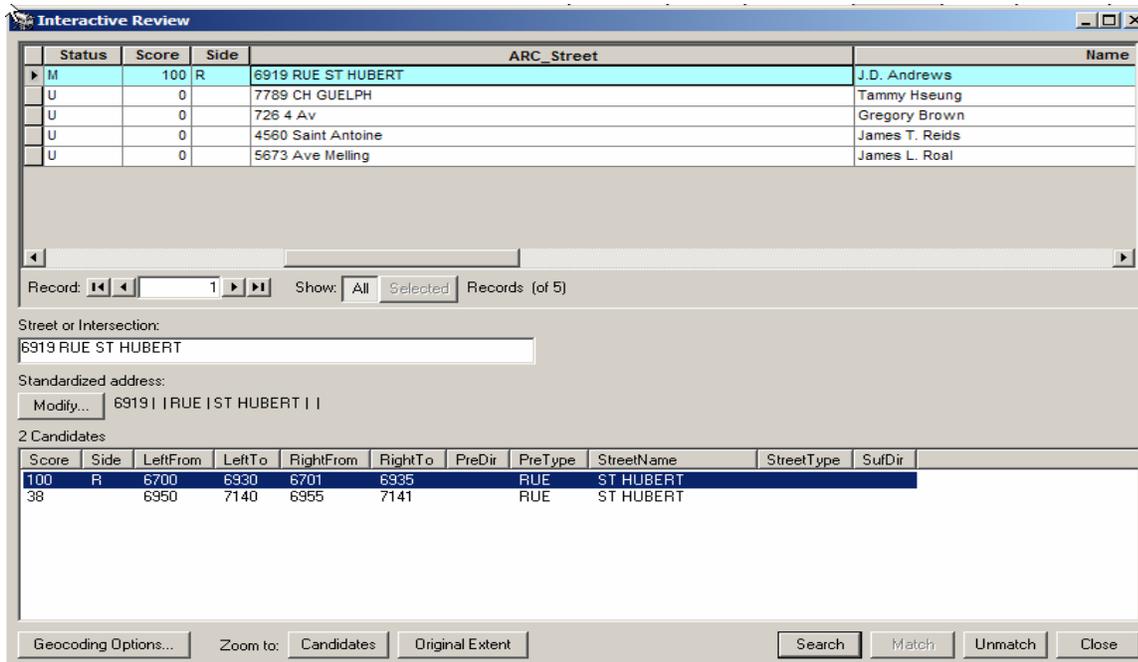
Sometimes, a spelling error is made when typing the address, fix the error in the Street or Intersection box or lower the spell sensitivity percentage by clicking Geocoding Options, then click Search. Find the correct candidate and click Match. Changes made to the Street or Intersection box will be preserved in the address table.



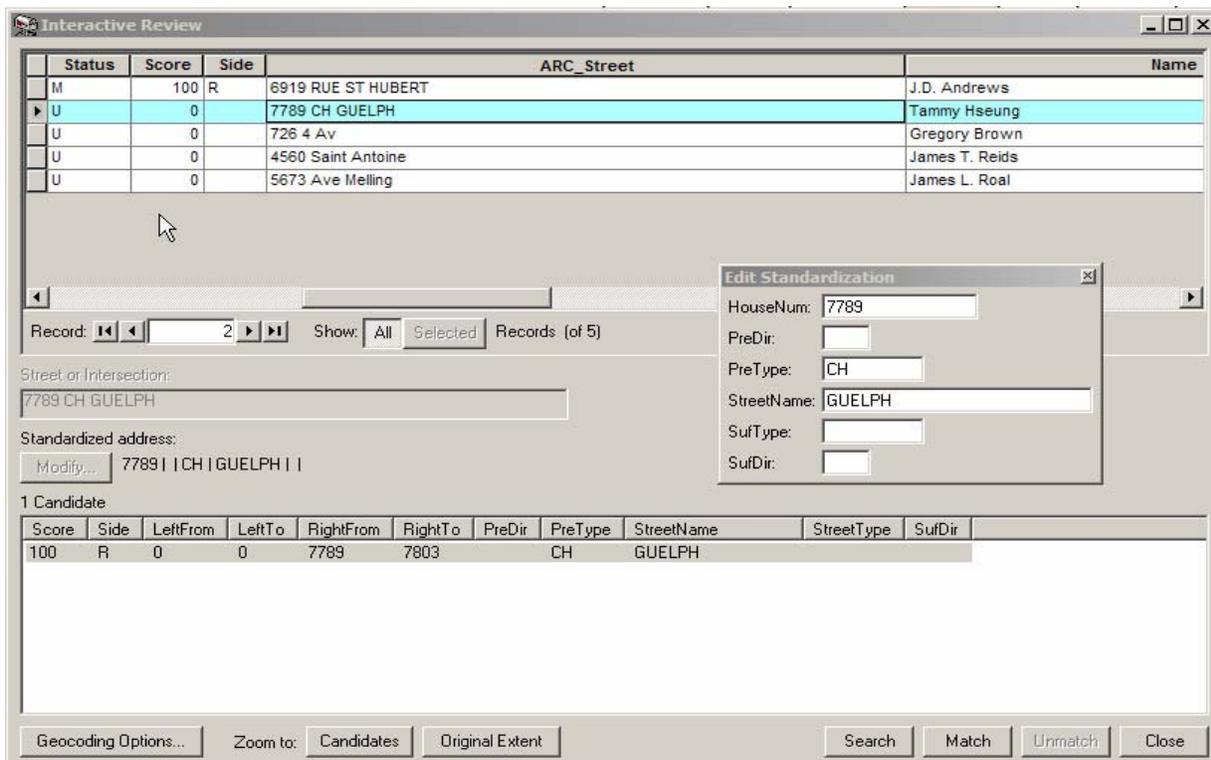
ArcGIS changes street names with prefix St. or St into the standard form Saint. However, sometimes the reference map lists the street in the abbreviated form. When a name with "Saint" does not match, one can try several forms of the word "Saint". The way that the address is currently viewed by the matching program shows left of the Modify button. To change it, click on Modify, then change the name of the address in the Address Box.



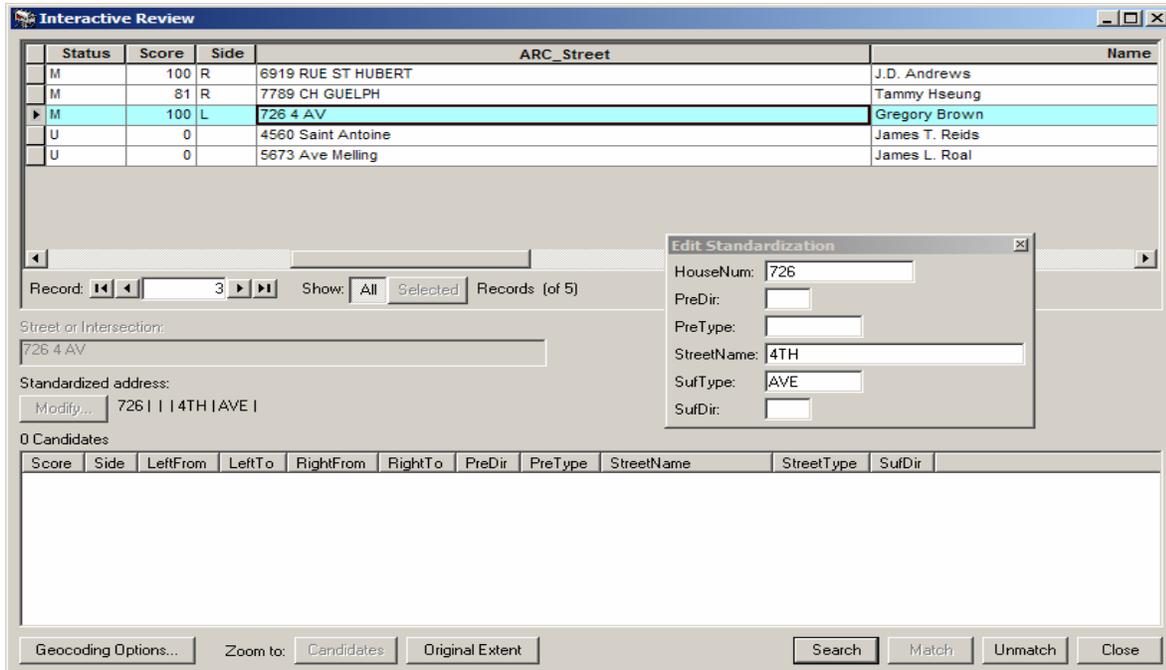
Select the right candidate and click Match.



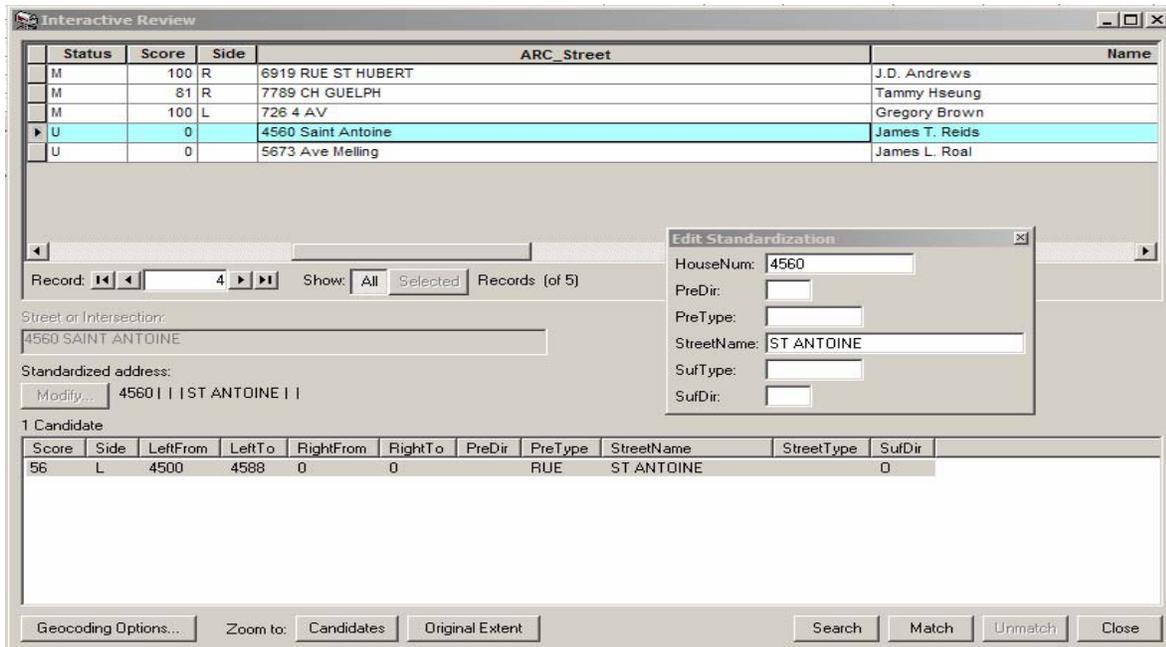
Sometimes, a prefix is not recognized. For example, CH meaning Chemin in French is interpreted by the program as Church. To put CH in the prefix, click the Modify button and make necessary changes. Select the right candidate and click Match.



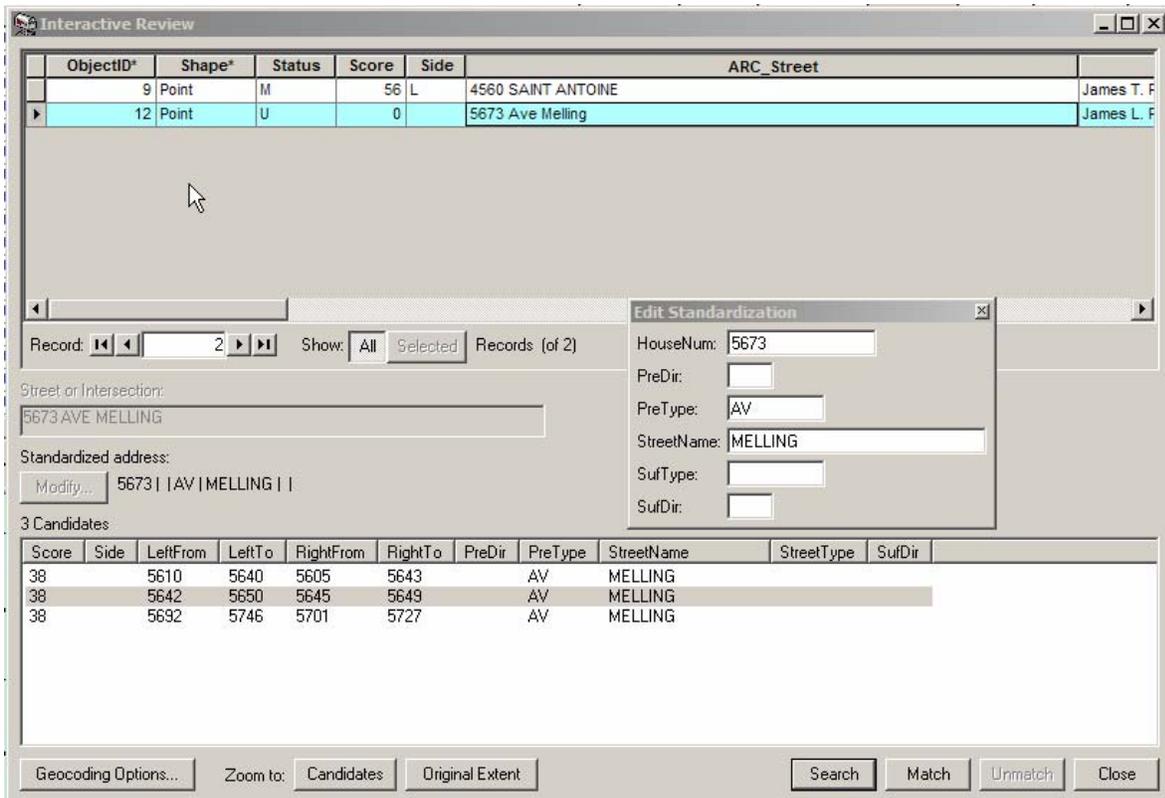
Street names that are numbers are extremely difficult for address matching programs. In this case, 4 AV has been automatically viewed as 4TH AVE. Click Modify and play around with different ways of writing until there is a match. As it turns out the reference map uses 4 AV. Find the right candidate and click match.



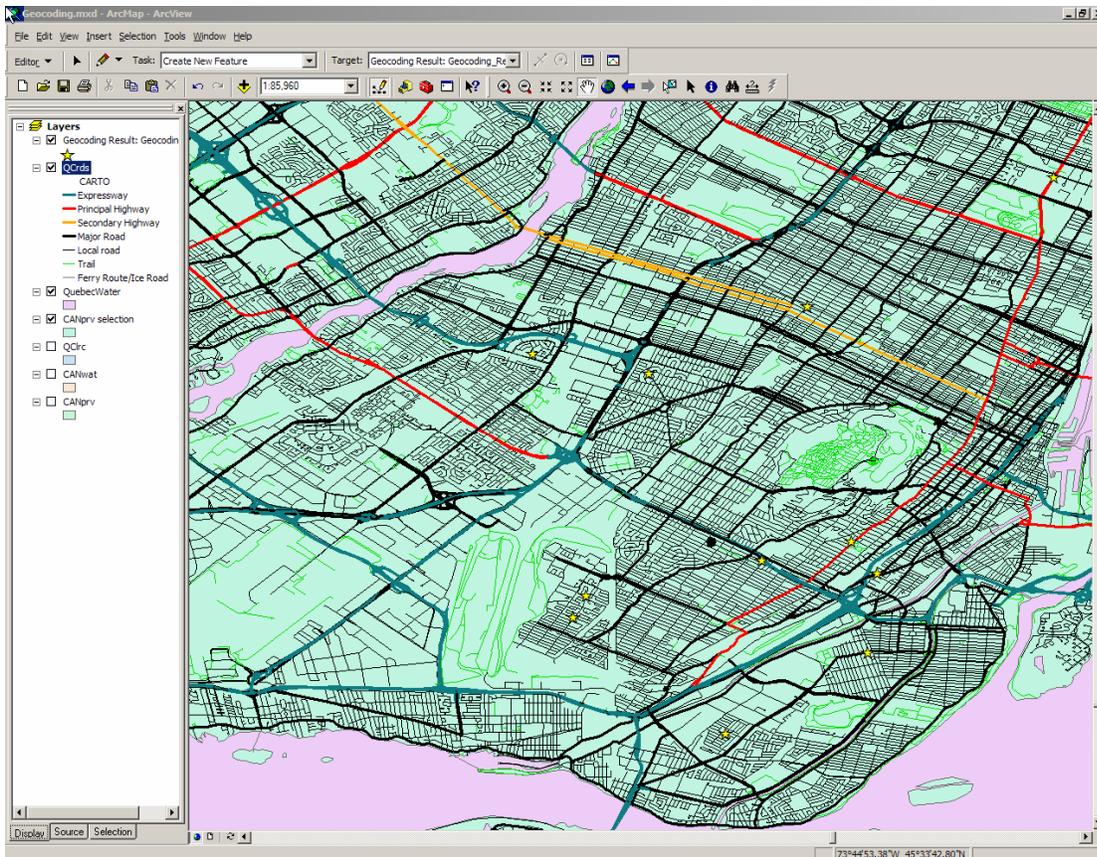
If a piece of information is missing, i.e. prefix type, the match score will not be perfect. Match the candidate anyway and/or add the information by typing in the Street Or Intersection Box. Click Match.



An address will have a low candidate score if everything else matches except the house number. If the house number does not exist, one can change the address if it is wrong, or match it to the candidate with the closest number. Click on the candidate and then click on Match.



When all addresses have been matched, click Close, then on the Review/Rematch Address window, click Done.



The addresses are now marked as points on the map. And geocoding is complete!

© Walter Hitschfeld Burnside Hall, 5th Floor 805 Sherbrooke Street West Montreal,  
Quebec H3A 2K6 Tel: (514) 398-7453 Fax: (514) 398-7437  
Email: [gic.library@mcgill.ca](mailto:gic.library@mcgill.ca)

Prepared by GIC Staff: Amy Kimball  
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