Step-by-Step Guide to Geocoding Using U.S. Census 2009 TIGER®

Step 1- Compile or obtain address list

If you are compiling your own address list, read through all steps first. This will help you determine the data and the data format you will need.

In older versions of ArcMap, your data will need to be in .txt (Tab delimited text file), .dbf (DBASE), or .mdb (Microsoft Access) to import into ArcMap. If your data comes to you in another format, most software packages have a Save As option which will convert your data into one of these formats. Arc 9+ allows for tables in Microsoft Excel to be added directly to your map file.

Confirm or edit addresses until at least one field contains address number and street name together and (if available) zip code in another field. You can leave any other data fields that you wish.

Tip: Use short, concise column labels without spaces or special symbols to avoid problems during the Save As or Add New Data processes.

Save your data file as .dbf , .txt, or .mdb if using Arc 8 or as .xls if using Arc 9+.

Step 2 – Open ArcMap

Add the TIGER line road layer(s) for area. If you do not have these files already, 2009 TIGER files can be downloaded at: http://www.census.gov/geo/www/tiger/.

The past three (2007-2009) Vintages of TIGER data are available in shapefile format from the U.S. Census Bureau. The All Lines file contains a column for road flag that will allow you to easily filter all edges down to roads for use in defining your geocoding service in the next step.

If you are geocoding for a multi-county area you will need to merge all of the road layers together and use this merged file as the reference file when you define the geocoding service in the next step. To merge these in Arc 8, use the Geoprocessing Wizard. In Arc 9, this process is a bit more complicated:

1. Copy one of the road layers to another location using the ArcToolbox/Data Management Tools/General/Copy. This prevents changing the original layer in case you need it in the future.
2. Using the ArcToolbox/Data Management Tools/General/Append, select the remaining road layer(s) to append/concatenate to the COPY of the first road layer.

Now you have a reference file to use when defining your geocoding service. This is a good time to add your address data file from step 1 and browse it in ArcMap. Make sure your data set is complete, sometimes errors will occur during the save as process and you will have to repeat the process.

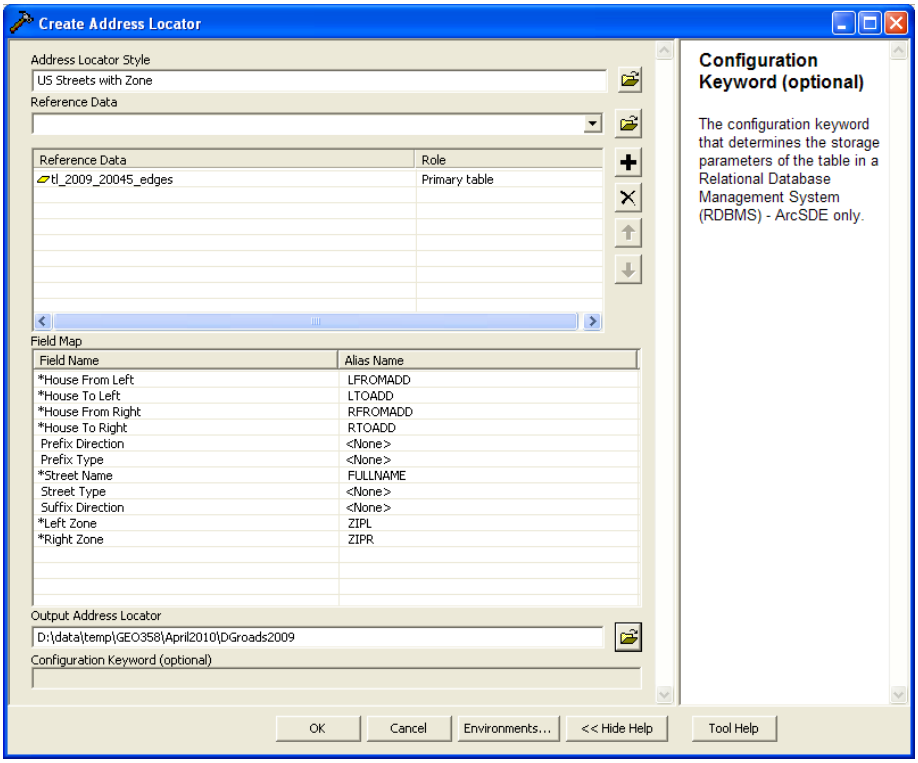
Tip: TIGER data are published without a defined projection, but are NAD 1983 data. The reference layer ***must*** have a defined projection for the geocoding service to work.

Step 3 – Create Address Locator (also called Geocoding Service)
You can define an Address Locator in ArcToolbox or ArcCatalog. The instructions that follow are for defining a service from the Toolbox panel within ArcMap.

In ArcMap, launch the Arc Toolbox panel, if not shown. In the toolbox pane, click to expand "Geocoding Tools" and select Create Address Locator.

A dialog box will open giving you a list of types of services you can define. If you have addresses from a single city or zip, the easiest way is to define a **US STREETS (FILE)** geocoding service using the TIGER shapefile filtered to display roads for the county. If your address data span several cities or counties OR if you have a zip code for each address then you will want to consider defining a **US STREETS WITH ZONE (FILE)** for greater accuracy. The 2009 TIGER All Lines file can be used for defining either type of service.

Once a type is selected:



1. Select your reference file. This is the TIGER road file from Step 2.

2. Set the role of the reference layer as "primary table".

3. Make sure all of the appropriate fields are recognized. If not, see image at right for fields to use from TIGER 2009.

4. Select a location and name for your geocoding service. It will get very confusing once you have defined a number of services if you have New Address Locator 1, New Address Locator 2, etc.

5. Click OK to compile the service.

6. Click Close once the process is complete.

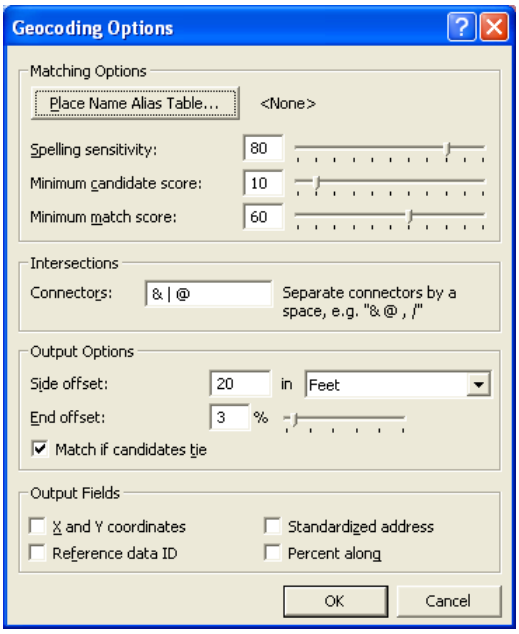
Step 4 – Geocode Address List
Right click on your address list in the layers window. Select Geocode Addresses. When the dialog box opens, you will see the service you just defined plus any other geocoding services previously used in the current map project.

With the new service highlighted, click OK.

Select, or verify the appropriate fields are selected from your address data set to correspond with the Address Input Fields needed by the geocoding service.

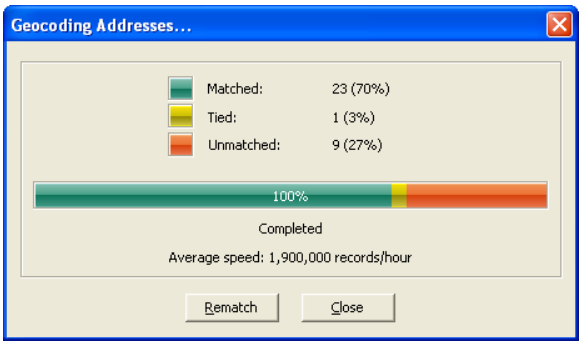
Tip: In the output section, it is helpful to save the resulting shapefile with a meaningful name and in a location where you will be able to locate it.

The Geocoding Options button will bring up a set of options for the geocoding service that you may wish to alter. These options include spelling sensitivity, intersection connectors, and output fields. The default values are shown below.



Click OK to run the service on your address data.

Step 5 – Review results



Once process completes, a Review/Rematch Addresses box will appear. This box will tell you how well your geocoding service worked and give you the opportunity to manually match any points that it was unable to locate.

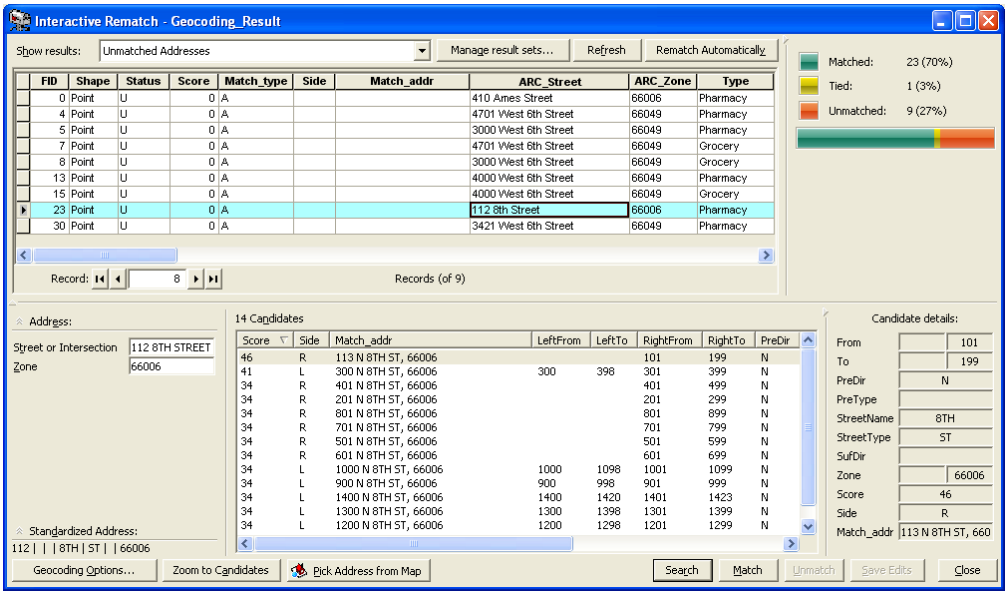
The critical points are those that remain unmatched. In the screen shot at the left you can see this is only 9 addresses.

Click Rematch to open the Interactive Review window. The "show results" drop down will allow you to view unmatched addresses, all addresses, addresses by score, or addresses with tied candidates. Start with unmatched addresses.

You will need to review each address shown in the top frame of the window.

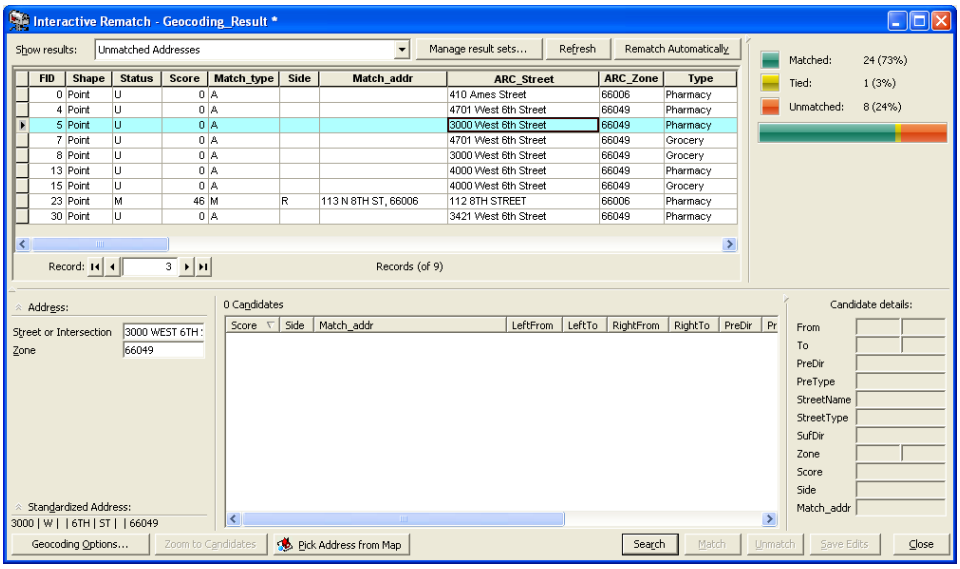
The bottom frame displays all possible matches for the selected address in the top frame.

In this example, you can see that TIGER is missing data on the LeftFrom and LeftTo fields for the first candidate shown.



This is likely the correct street segment for the selected address point. Highlight this candidate and click the Match button.

The next example, however, does not display any possible matches.



This requires a bit more knowledge of the area or the assistance of an online tool like Google Maps.

From Google Maps you can get a good idea of the correct location for this point. Zoom into the general area in your map project. Click the Pick Address from Map button and then right click on the map in the correct location and select Pick Address to set the address point.

You can also modify the address to match TIGER. In the addresses shown above, for example, the 400 block of Ames Street is labeled N 300 Road in TIGER. Modify the address in the lower left pane to view candidates for the revised location. In this case, the revision will yield a 100% match.

Repeat this process for each point listed in the top window. Once you are finished, click the Close button.

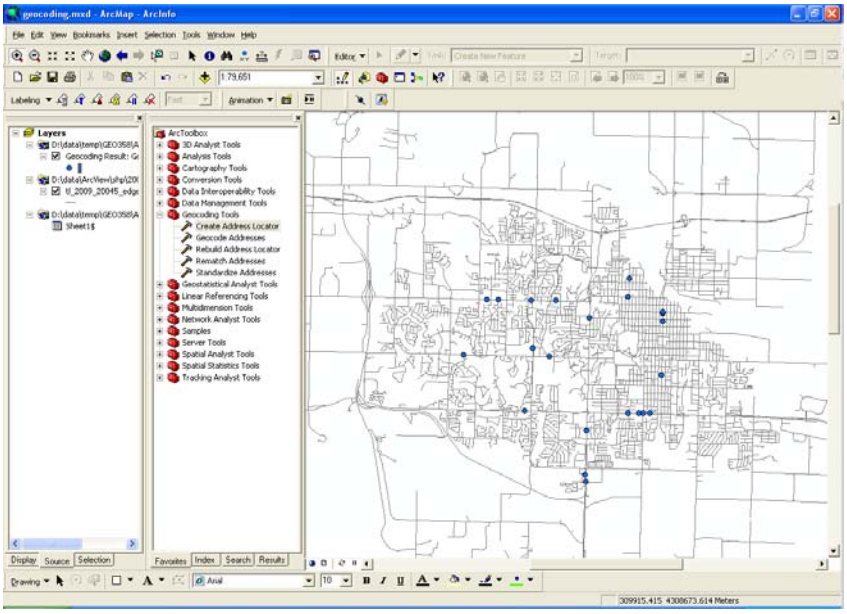
Step 6 - Reviewing matched addresses

It is always a good idea to verify some (or all) of the addresses to ensure the geocoding process placed the address point in the correct place. In particular, you should verify all of the addresses with tied candidates. This is more important when dealing with multi-county areas, but the same address may exist more than once in a single county. For example, the address 408 Elm is valid in both the cities of Lawrence and Baldwin City resulting in tied possibilities and potentially placing the point in the incorrect city. To reopen the review address window, right click on the newly created address point layer, select data, and then select Review/Rematch Addresses. Select Matched (and subsequently Unmatched) Addresses with Candidates Tied to review all points with one or more candidates.

Review your map for outliers. Some points, especially when geocoding for a large area, may be placed in a different city or obviously outside the area of interest.

Tip: You can reduce the chance of misplaced points by defining your geocoding service to include the zip code (if it is available in your address data).

When you are finished reviewing or correcting any misplaced points, click Close. Review your map and ensure any edited points were moved to the correct location.



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