

## **Step-by-Step Guide to Geocoding Using US Census TIGER**

### ***Step 1- Compile or obtain address list***

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

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.

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 to avoid problems during the Save As or Add New Data processes.

Save your data file as .dbf , .txt, or .mdb.

### ***Step 2 – Open ArcMap***

Add the TIGER line road layer(s) for area. If you do not have these files already, the 2000 TIGER files can be downloaded at:

[http://www.esri.com/data/download/census2000\\_tigerline/index.html](http://www.esri.com/data/download/census2000_tigerline/index.html)

If you are geocoding for a multi-county area you will need to merge all of the road layers together to use 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 just 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 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 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.

### ***Step 3 – Define Geocoding Service***

You can define a Geocoding Service (also called Address Locator) in ArcToolbox or ArcCatalog. I feel that ArcCatalog has a better interface and is easier for new users. Once you are more experienced with writing Geocoding Services, check out the ArcToolbox method.

Open ArcCatalog. In the catalog pane (on the left) click to expand “Address Locators”. In the right window, you will see all previously defined services (if any).

Click Create New 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 line file for roads for the county. If your data spans several cities or counties **AND** you have a zip code available for each address then you will want to consider defining a **US STREETS WITH ZONE (FILE)**. Select the type appropriate for your reference file.

Once a type is selected, a new form will appear.

1. Enter a name for your geocoding service. It will get very confusing after a while if you have New Address Locator 1, New Address Locator 2, etc.

2. Set your reference file. This is the TIGER road file that you have or created in Step 2.

3. Make sure all of the appropriate fields are recognized. If you are defining a service without a zipcode, only Prefix Type, Left Zone, and Right Zone will be <None>.

4. All options on the right-hand side can be altered, if you choose to, at the time you geocode your addresses. Setting them here will establish defaults, but you will still have the option of changing them later. Click OK to complete this process.

Close ArcCatalog.

#### ***Step 4 – Geocode Address List***

In ArcMap, right click on your address list in the layers window. Select Geocode Addresses. When the dialog box opens, you will see any geocoding services previously used on the project. Usually though, this window is blank and you will need to add a geocoding service.

Click Add. Click the drop down arrow next to the Look In box. Select Address Locators to view a list of all available geocoding services. Select the service you defined in Step 3 and click Add. With your service highlighted, click OK.

Select the appropriate fields 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 the default options you set in Step 3 for the geocoding service and allow you to alter the options for this batch, if so desired.

### 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 7 addresses.

Make sure “Unmatched addresses” is selected in the Rematch Criteria section and click Match Interactively.

The Interactive Review window will now appear with only those addresses that remain unmatched.

You will need to review each address that is shown in the top window.

The bottom window displays all possible matches for this address.

In this example, you can see that TIGER is missing data on the FRADDR and TOADDR fields for the first choice. This is likely the correct street segment. You can highlight it and click the Match button.

FID	Shape	Status	Score	Side	ARC_Street
62	Point	U	0		4601 Independence Ave
64	Point	U	0		7900 Lees Summit Rd
104	Point	U	0		7900 Lees Summit Rd
131	Point	U	0		4601 Independence Ave
159	Point	U	0		4601 Independence Ave
259	Point	U	0		7900 Lees Summit Rd
263	Point	U	0		7900 Lees Summit Rd

Score	Side	LeftFrom	LeftTo	RightFrom	RightTo	PreDir	PreType	StreetName	StreetType	SufDir
38		4600	4644	0	0			INDEPENDENCE	AVE	
38		4646	4638	4603	4699			INDEPENDENCE	AVE	

FID	Shape	Status	Score	Side	ARC_Street
62	Point	U	0		4601 Independence Ave
64	Point	U	0		7900 Lees Summit Rd
104	Point	U	0		7900 Lees Summit Rd
131	Point	U	0		4601 Independence Ave
159	Point	U	0		4601 Independence Ave
259	Point	U	0		7900 Lees Summit Rd
263	Point	U	0		7900 Lees Summit Rd

Record: 2 | Show: All Selected Records (of 7)

Street or Intersection:  
7900 LEES SUMMIT RD

Standardized address:  
7900 | | LEES SUMMIT | RD |

0 Candidates

Score	Side	LeftFrom	LeftTo	RightFrom	RightTo	PreDir	PreType	StreetName	StreetType	SufDir
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Geocoding Options... Zoom to: Candidates Original Extent Search Match Unmatch Close

The second entry, however, does not display any possible matches.

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

In this example, I suspect that “Lees Summit Rd” should be “Lee’s Summit Rd”. To try this change, click the Modify button (left side in the middle). Make the change and press the Tab key. This will allow you to view the

possible matches without closing the modify box in case other changes to this address are needed.

FID	Shape	Status	Score	Side	ARC_Street
62	Point	U	0		4601 Independence Ave
64	Point	U	0		7900 Lees Summit Rd
104	Point	U	0		7900 Lees Summit Rd
131	Point	U	0		4601 Independence Ave
159	Point	U	0		4601 Independence Ave
259	Point	U	0		7900 Lees Summit Rd
263	Point	U	0		7900 Lees Summit Rd

Record: 2 | Show: All Selected Records (of 7)

Street or Intersection:  
7900 LEES SUMMIT RD

Standardized address:  
7900 | | LEE'S SUMMIT | RD |

1 Candidate

Score	Side	LeftFrom	LeftTo	RightFrom	RightTo	PreDir	PreType	StreetName	StreetType	SufDir
100	R	7901	8299	7900	8298			LEE'S SUMMIT	RD	

Geocoding Options... Zoom to: Candidates Original Extent Search Match Unmatch Close

You can see on the left that in this example, adding the apostrophe brought up only one possibility.

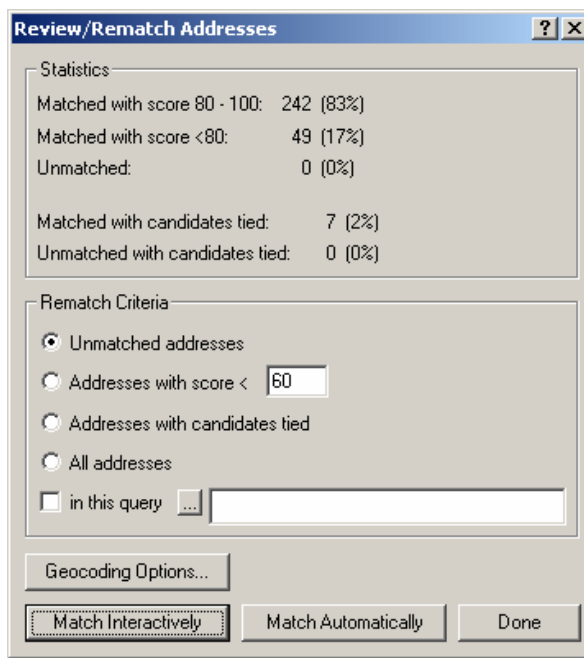
Select the correct road segment and click the Match button.

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

Now you will see the updated statistics.

### 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 both in the city of Lawrence and Baldwin City resulting in tied possibilities and potentially placing the point in the incorrect city.



The 'Review/Rematch Addresses' dialog box displays statistics and rematch criteria. The Statistics section shows: Matched with score 80 - 100: 242 (83%), Matched with score <80: 49 (17%), Unmatched: 0 (0%), Matched with candidates tied: 7 (2%), and Unmatched with candidates tied: 0 (0%). The Rematch Criteria section has radio buttons for 'Unmatched addresses' (selected), 'Addresses with score < 60', 'Addresses with candidates tied', and 'All addresses'. There is a checkbox for 'in this query' with an empty text field. At the bottom are buttons for 'Geocoding Options...', 'Match Interactively', 'Match Automatically', and 'Done'.

Statistics	
Matched with score 80 - 100:	242 (83%)
Matched with score <80:	49 (17%)
Unmatched:	0 (0%)
Matched with candidates tied:	7 (2%)
Unmatched with candidates tied:	0 (0%)

Rematch Criteria

☒ Unmatched addresses

☐ Addresses with score < 60

☐ Addresses with candidates tied

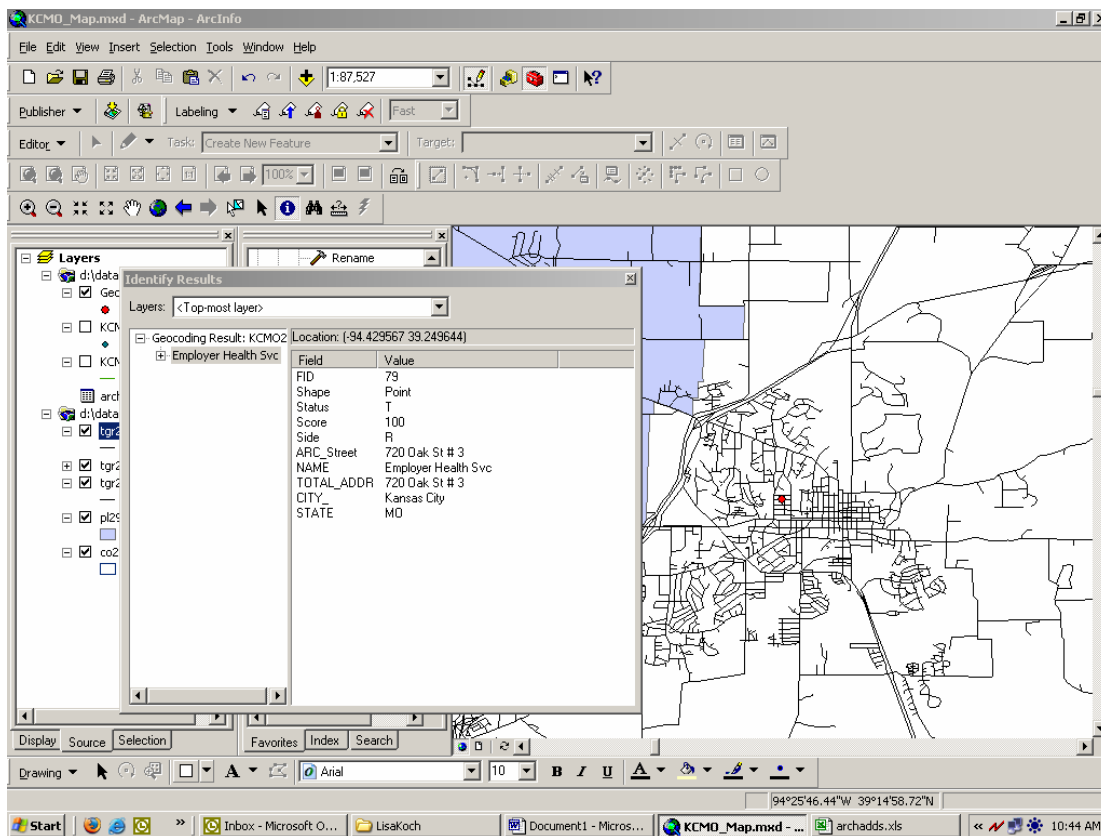
☐ All addresses

☐ in this query [ ]

Geocoding Options...

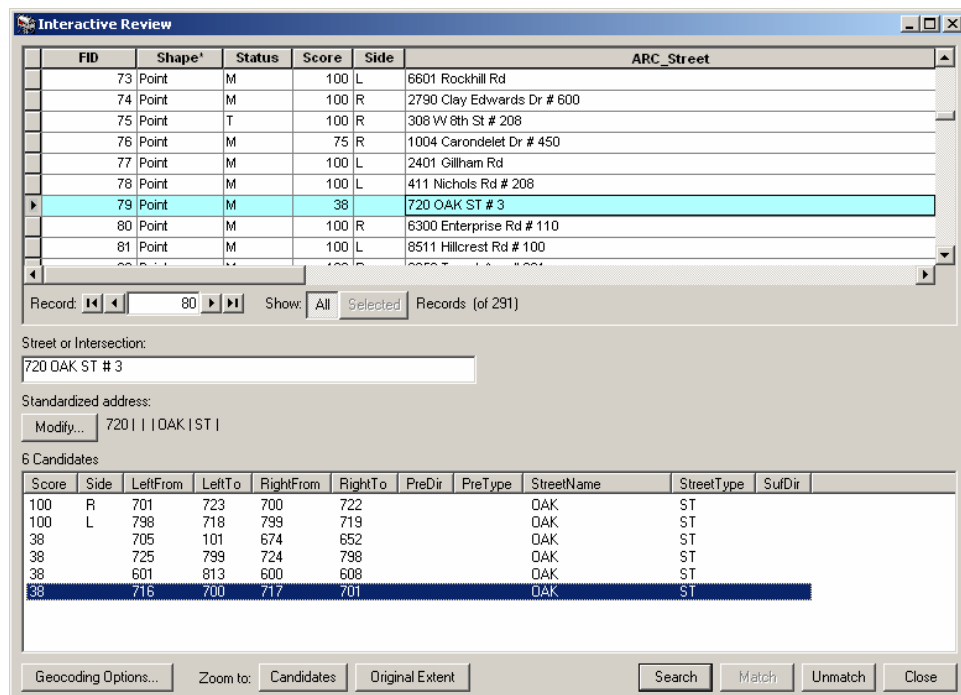
Match Interactively Match Automatically Done

Click Done to close the Review/Rematch window and return to your map. You will now see your addresses as points on the map. Identify or select all points that have a Status code='T'. This indicates the address had two or more possible matches with the same score. Also look for any outliers. In this example, all points were supposed to be within Kansas City, Missouri. Adding the layer for the city boundary quickly identified the point shown below as being outside the city.

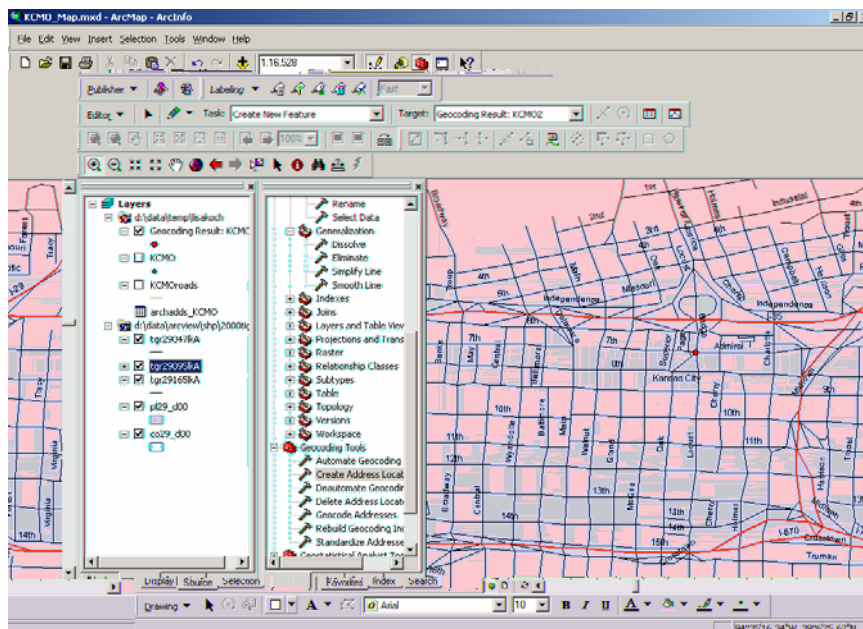


T

In this example, the correct line segment is the last one listed. Click on the correct segment and then click the Match button. You will see the status for this point change to “M” for matched.



When you are finished correctly matching each point that needs correction, click Close and then Done. Review your map and ensure each point was moved to the correct location.



**Questions?** Please contact:

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