

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

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).

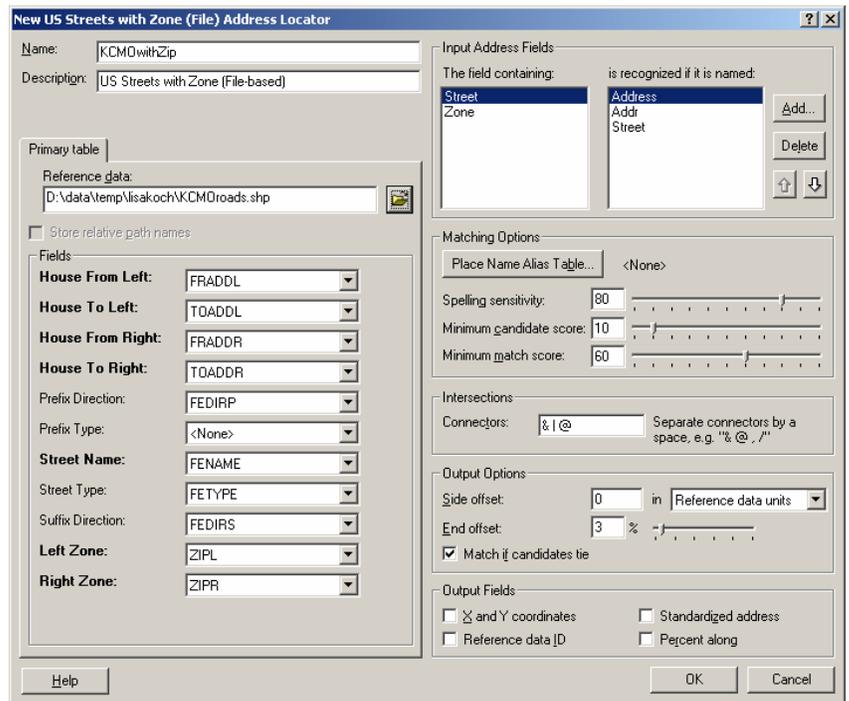
Click Create New Address Locator. A dialog box will open giving you a list of types of services you can define. If you have addresses from a single city or zip, the easiest way is to define a **US STREETS (FILE)** geocoding service using the TIGER line file for roads for the county. If your data spans 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.

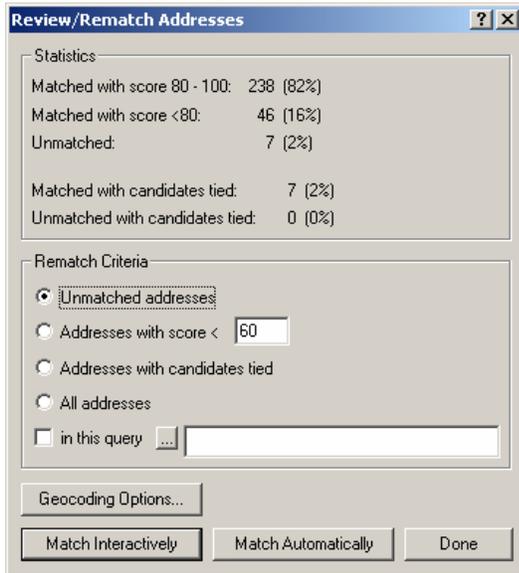
Click Add. Click the drop down arrow next to the Look In box. Select Address Locators to view a list of all available geocoding services. Select the service you defined in Step 3 and click Add. With your service highlighted, click OK.

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.

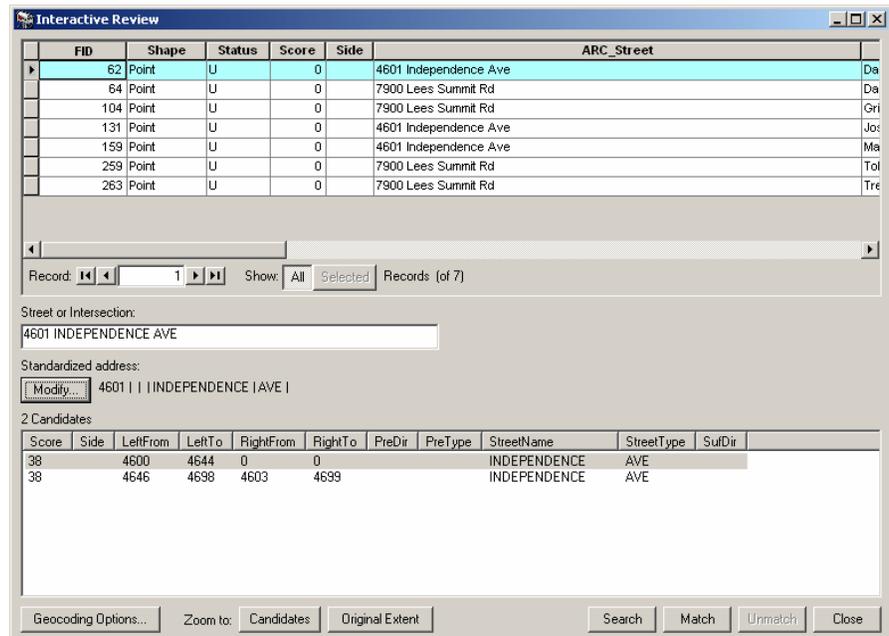
Make sure “Unmatched addresses” is selected in the Rematch Criteria section and click Match Interactively.

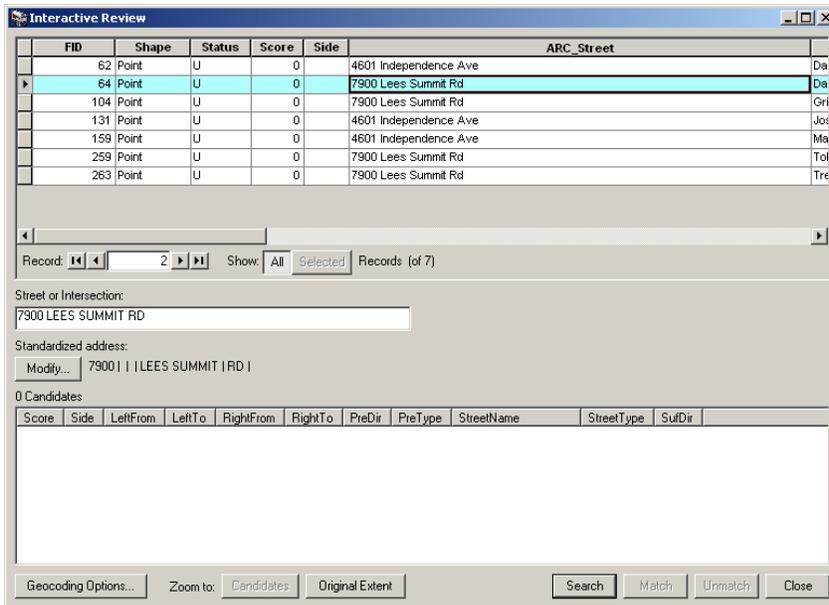
The Interactive Review window will now appear with only those addresses that remain unmatched.

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.



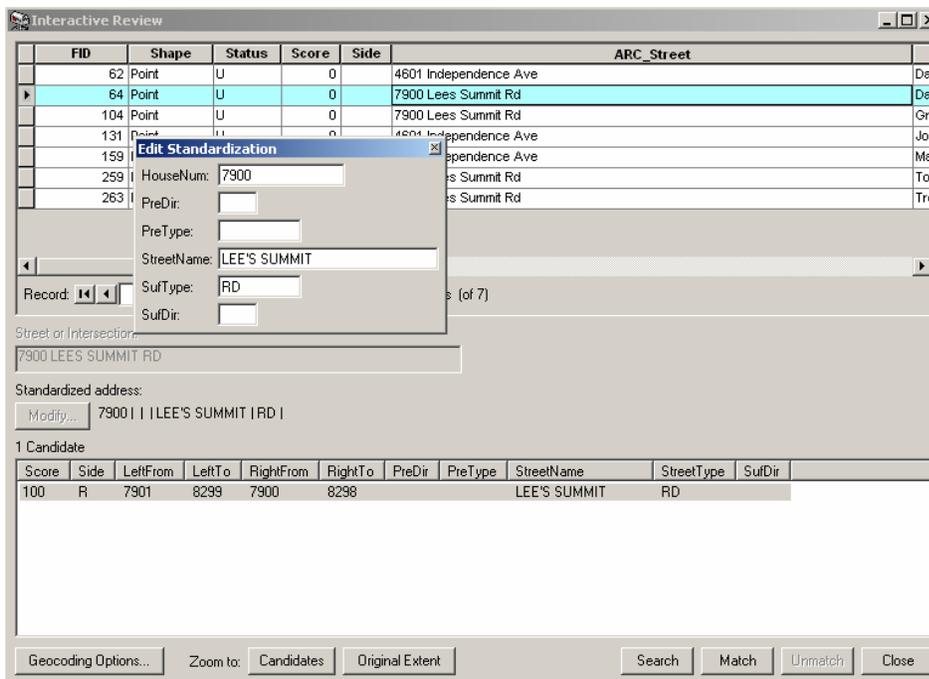


The second entry, however, does not display any possible matches.

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.



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

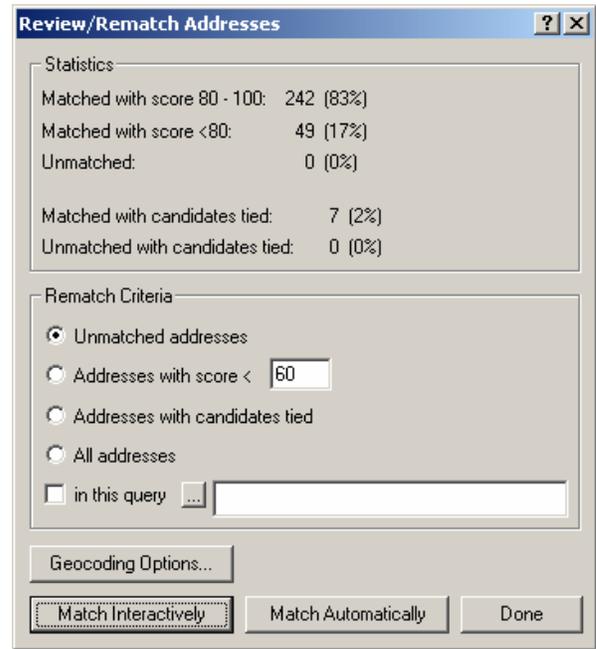
Select the correct road segment and click the Match button.

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

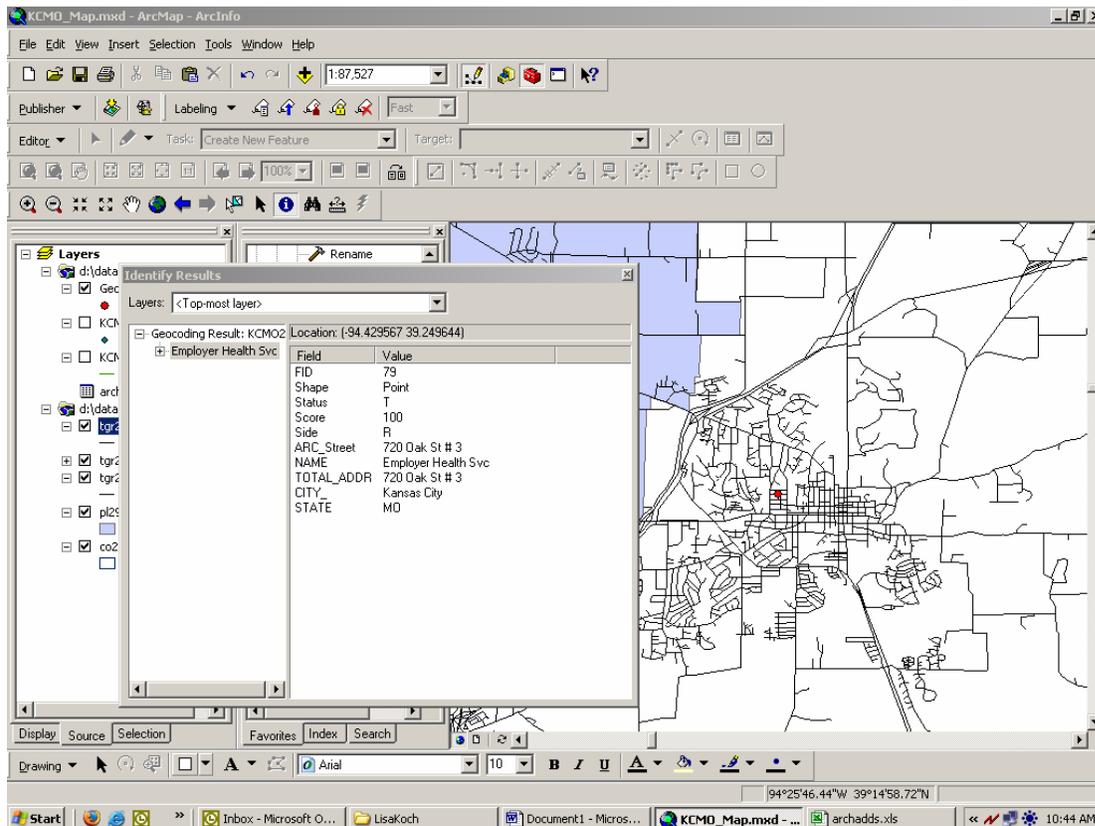
Now you will see the updated statistics.

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.



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.



This is where a service like MapQuest comes in handy, especially if you are not very familiar with the area you are mapping.

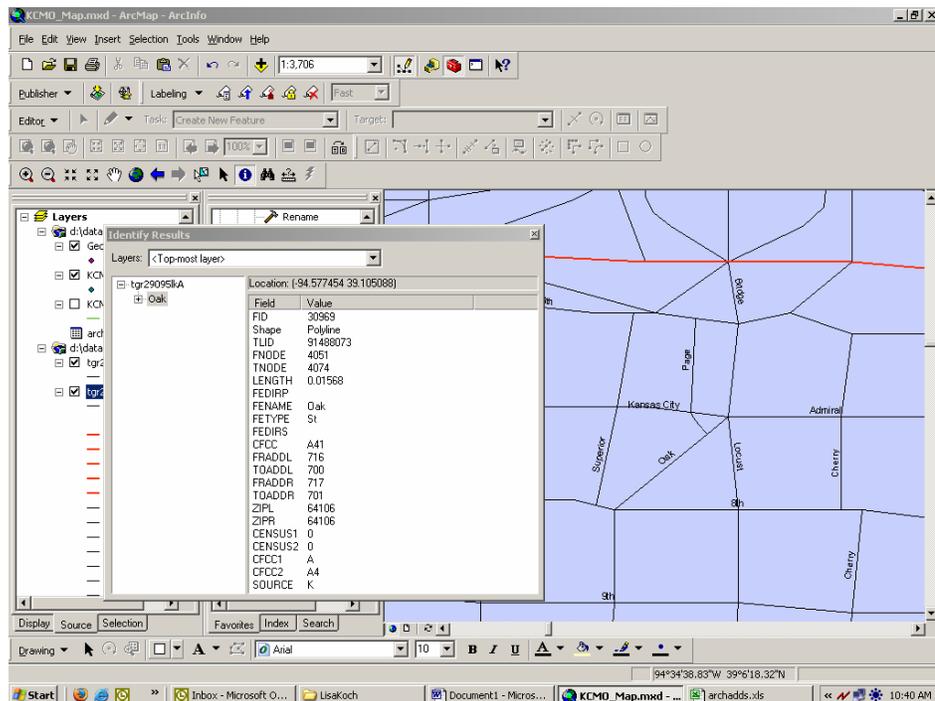
In this example, I quickly confirmed that the geocode point for 720 Oak Street, Kansas City, Missouri was in the wrong place.



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

Locate the correct road line segment on your map.

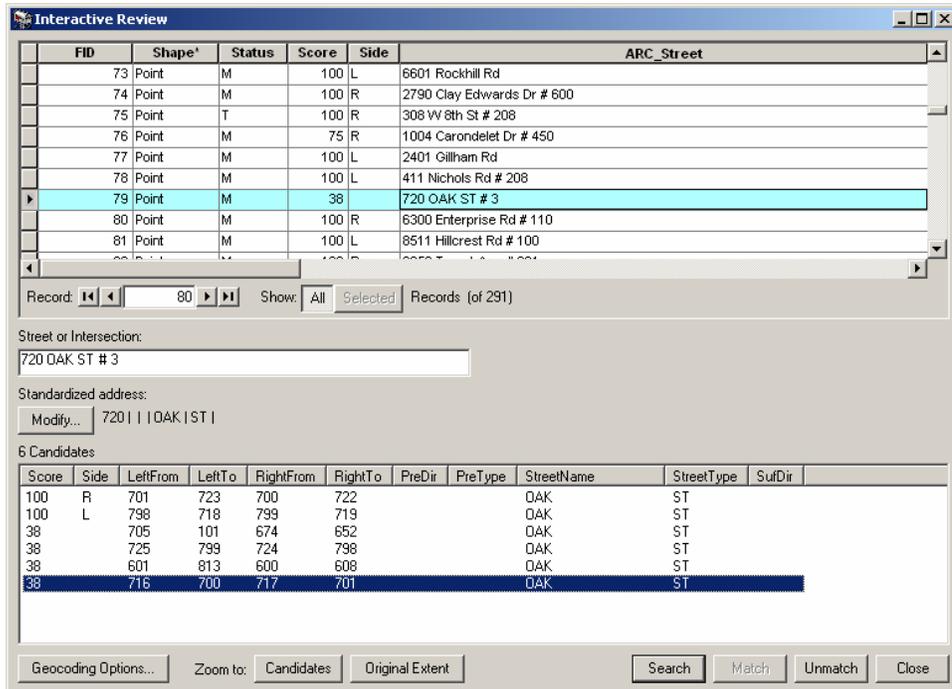
Use the Identify tool to view the segment identification. Often times, TIGER data is incomplete and the line segment will have missing attributes. Note any identifying measures for the correct segment to help you select it from the Review/Rematch section.



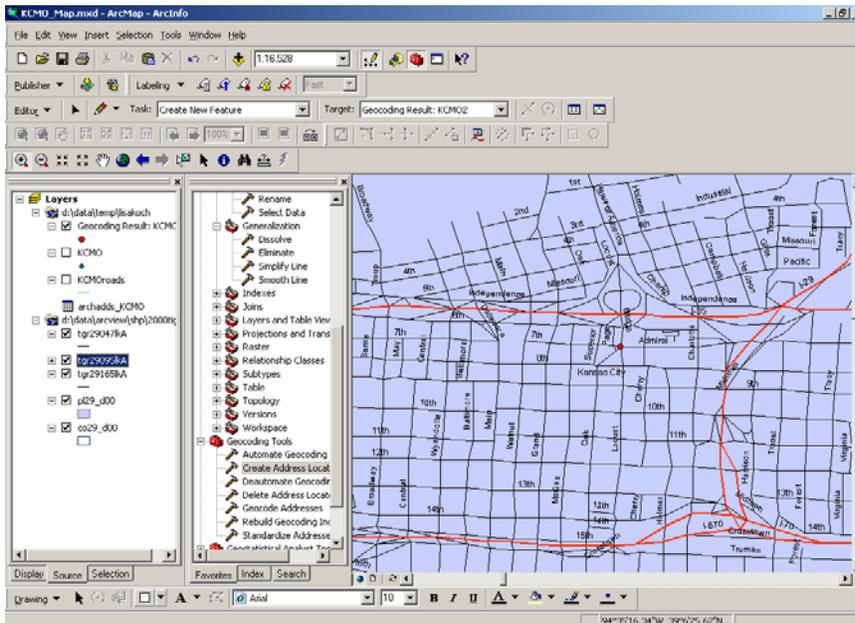
Right click on your new shapefile of addresses. Select Data and then Review/Rematch Addresses. This will open the statistics window again and allow you to Match Interactively any address points that you have identified as being in the wrong place. Select All Addresses and then click Match Interactively.

Tip: Addresses will appear in order by FID. Noting the FID for any points that need to be moved will make it easier to locate them in the list.

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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