


## GIS II: Data Management Geocoding Exercise

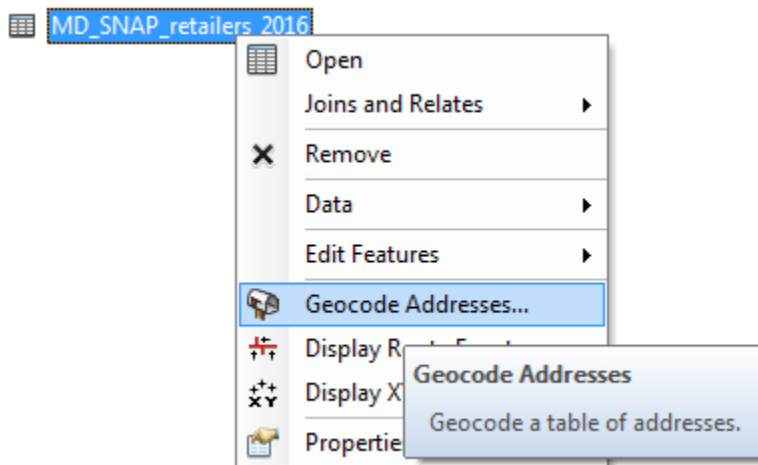
\*\*\* Files needed for exercise: *MD\_SNAP\_retailers\_2016.dbf*, *MD\_county10\_prj\_carto.shp*

**Goals:** The goals of this exercise are to understand the steps in the geocoding process and to practice performing interactive hand geocoding.

**Skills:** After completing this exercise, you will be able to successfully geocode addresses in ArcGIS.

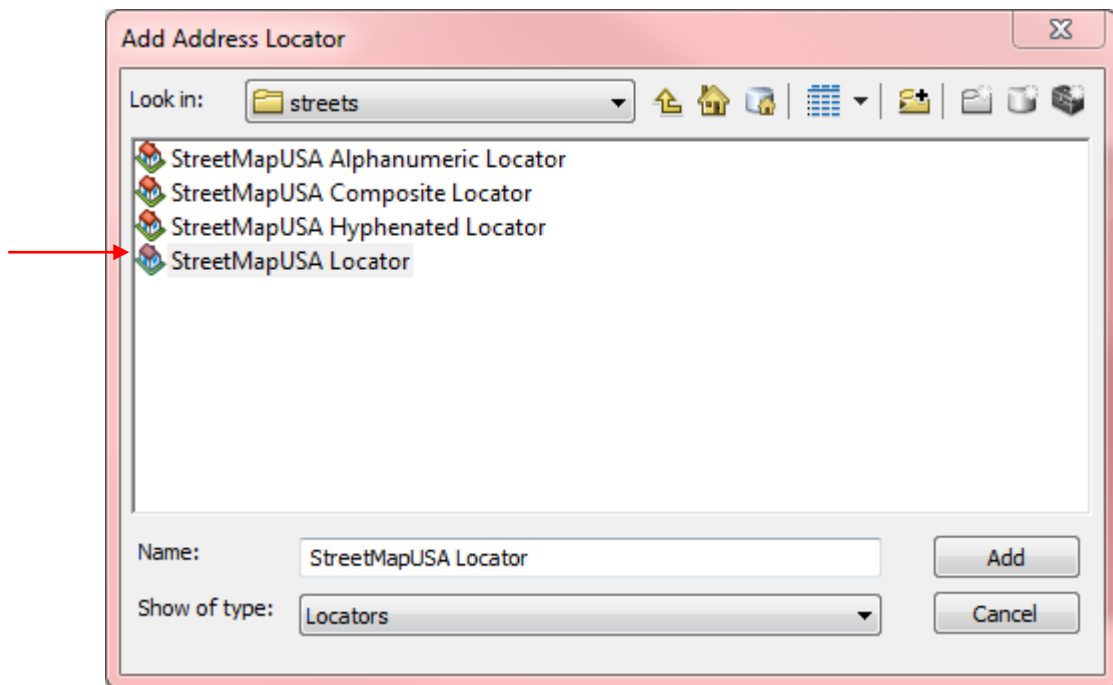
### Geocoding a Table of Addresses

1. Open a new blank map in ArcMap.
2. Click the **Add Data** button , browse to the Geocoding Exercise\_Data folder and add *MD\_SNAP\_retailers\_2016.dbf*. This dbf lists retailers in Maryland that accept SNAP (Supplemental Nutrition Assistance Program) benefits from the USDA Food and Nutrition Service. If you open the attribute table, you can see that there is address information for 3,999 retailers. All the necessary fields are present: ID, address, city, state, and ZIP code, as well as some additional information such as the name of the retailer.
3. Right click on the table and choose **Geocode Addresses....**

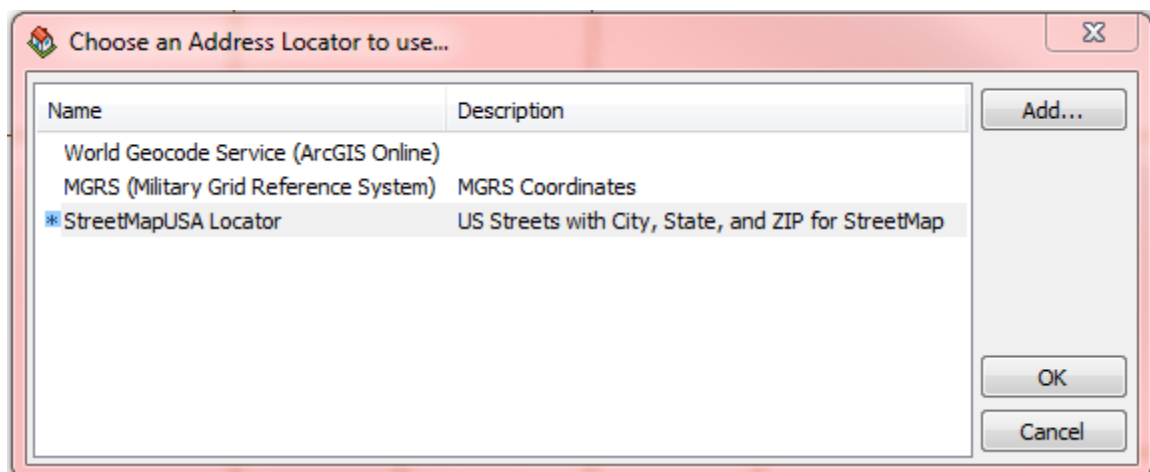


4. You will first need to select an address locator. By default, one or more address locators may be listed, however, you will use a different desktop locator. Click **Add** and browse to the Exercise\_Data folder where you will find a folder called "streets" which contains desktop locators. Select the **StreetMapUSA Locator**, and click **Add**.

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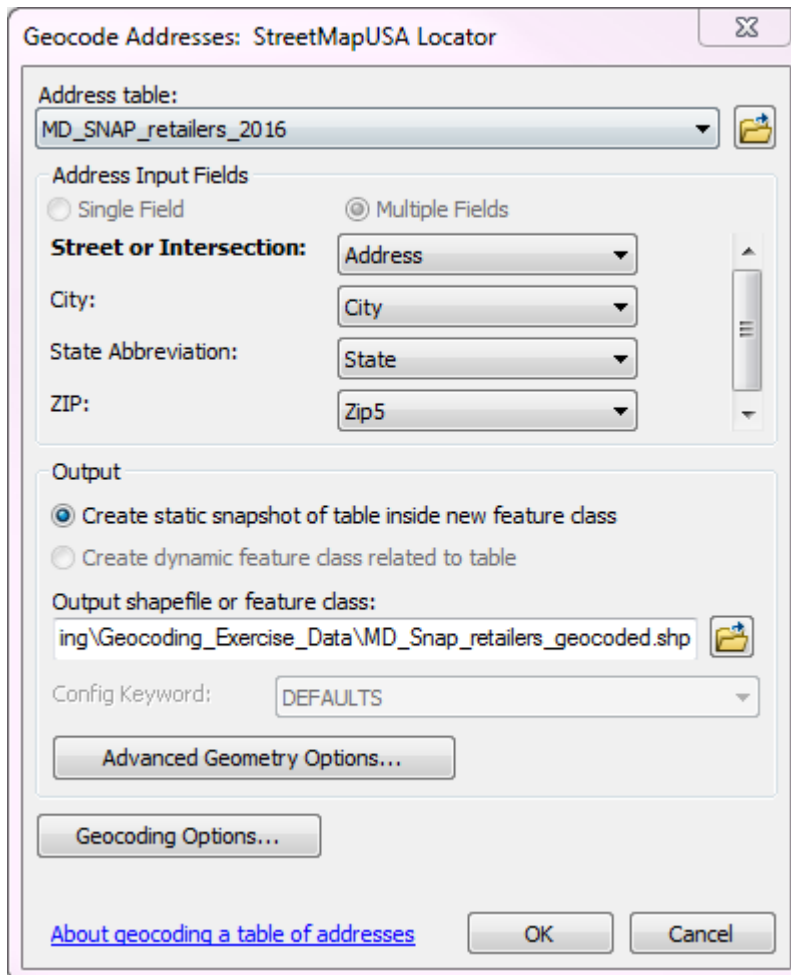


- It may take a few seconds for the StreetMapUSA Locator to appear in the list. When it does, select it and click **OK**.



- You will now need to specify the fields used for geocoding, as well as the path of the output shapefile. The correct fields should already be filled in for you because they are named appropriately, but double check. Make sure your output file is named something logical, NOT Geocoding\_Result.shp, and is saved in your Exercise\_Data folder for this module.

## GIS II: Data Management Geocoding Exercise



Geocode Addresses: StreetMapUSA Locator

Address table:  
MD\_SNAP\_retailers\_2016

Address Input Fields

Single Field  Multiple Fields

**Street or Intersection:** Address

City: City

State Abbreviation: State

ZIP: Zip5

Output

Create static snapshot of table inside new feature class  
 Create dynamic feature class related to table

Output shapefile or feature class:  
ing\Geocoding\_Exercise\_Data\MD\_Snap\_retailers\_geocoded.shp

Config Keyword: DEFAULTS

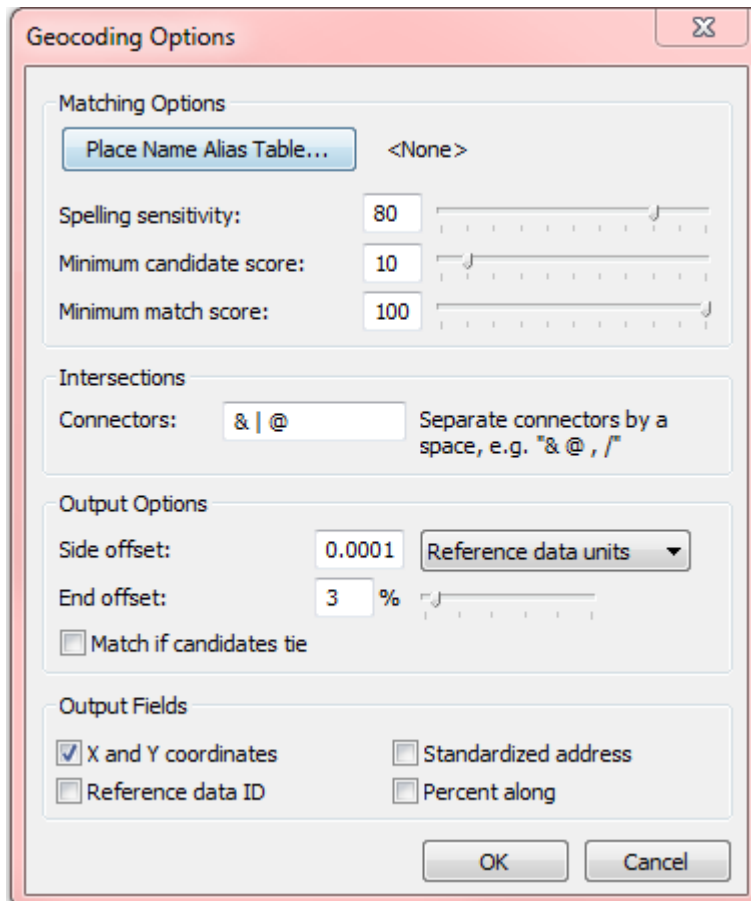
Advanced Geometry Options...

Geocoding Options...

[About geocoding a table of addresses](#) OK Cancel

7. Click the button for **Geocoding Options**. Leave the default **spelling sensitivity** at 80 and **minimum candidate score** at 10. Make sure that the **minimum match score** is set to 100. Uncheck the box for **match if candidates tie** since this is not recommended. Check the box for **X and Y coordinates** to have latitude/longitude coordinates automatically generated in the geocoding process.

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**Geocoding Options**

Matching Options

Place Name Alias Table... <None>

Spelling sensitivity: 80

Minimum candidate score: 10

Minimum match score: 100

Intersections

Connectors: & | @ Separate connectors by a space, e.g. "& @ , /"

Output Options

Side offset: 0.0001 Reference data units

End offset: 3 %

Match if candidates tie

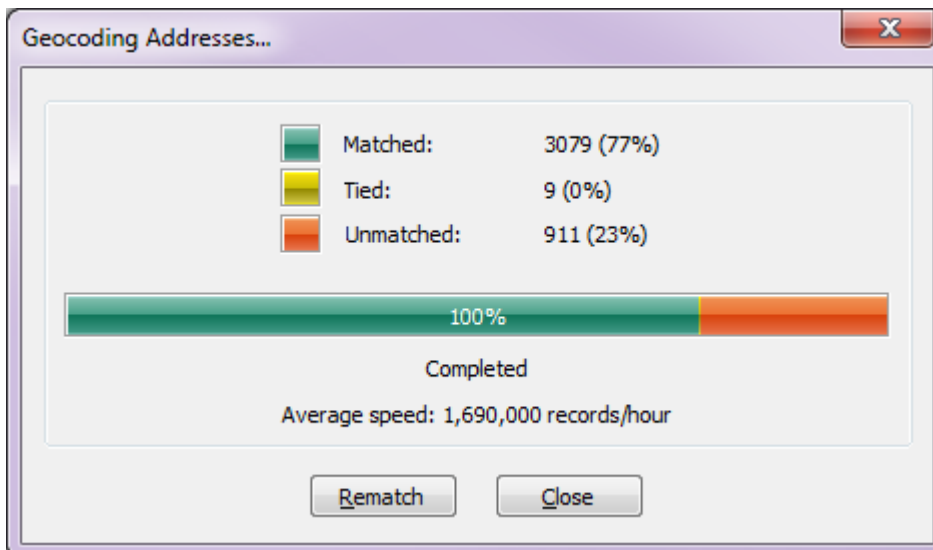
Output Fields

X and Y coordinates  Standardized address

Reference data ID  Percent along

OK Cancel

8. Click **OK** to exit the geocoding options, then click **OK** to run the geocoder.



**Geocoding Addresses...**

<span style="color: green;">■</span> Matched:	3079 (77%)
<span style="color: yellow;">■</span> Tied:	9 (0%)
<span style="color: orange;">■</span> Unmatched:	911 (23%)

100%

Completed

Average speed: 1,690,000 records/hour

Rematch Close

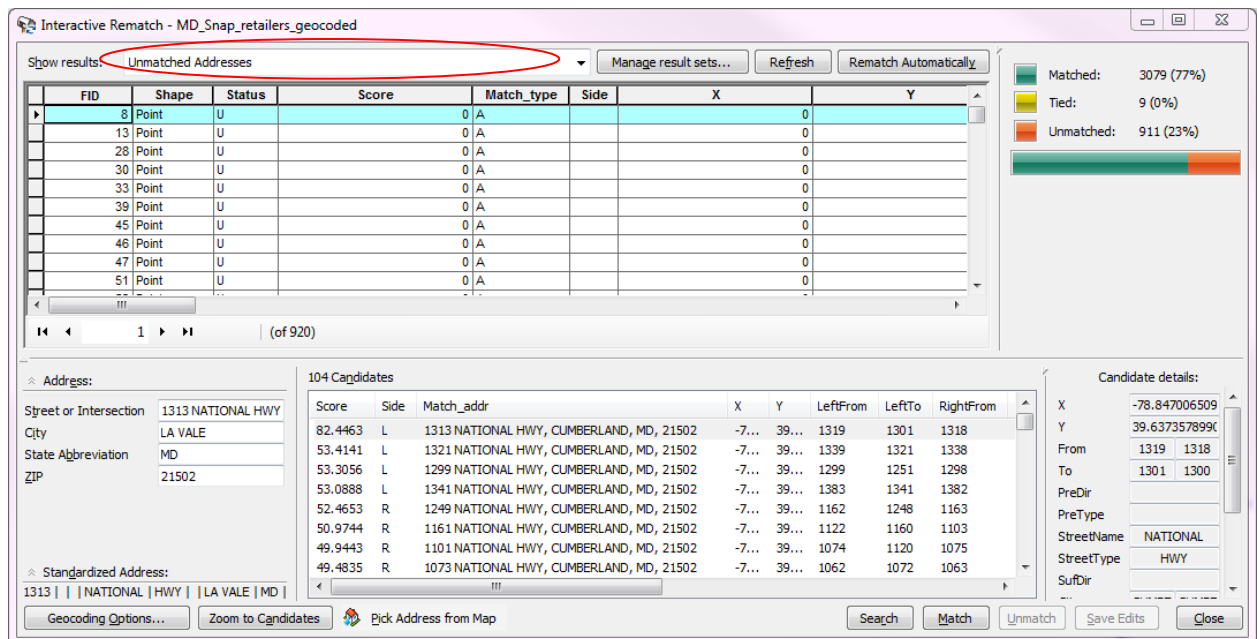
9. When the window shows that the geocoding is complete, click **Close** and your resulting geocoded points will be added to the map as a new layer.

## GIS II: Data Management Geocoding Exercise

- If you open up the attribute table, you can see the results. In the **Status** field, M is a matched record, T is a tie, and U is an unmatched record. You might notice that some of these unmatched records are missing information or have errors in the address. You will try to match them by hand. Close the table.
- Turn on the Geocoding toolbar by going to **Customize > Toolbars > Geocoding**. Make sure you have your geocoding results layer selected in your Table of Contents, and that you are using the correct address locator, StreetMapUSA Locator. Click on the last button on the Geocoding toolbar, **Review/Rematch Addresses**.




- On the **Interactive Rematch** screen, select **Unmatched Addresses** from the **Show results** dropdown menu. We will try and match some of these addresses by hand.



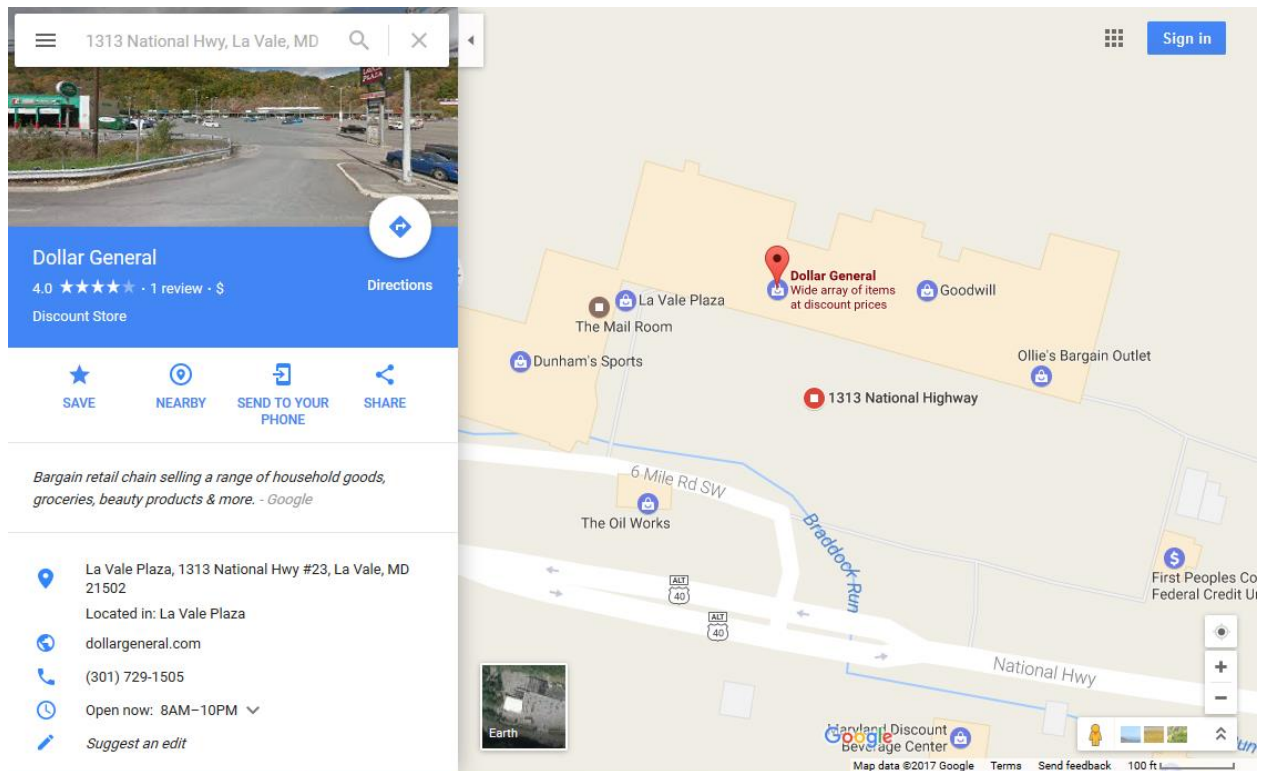
FID	Shape	Status	Score	Match_type	Side	X	Y
8	Point	U	0	A		0	0
13	Point	U	0	A		0	0
28	Point	U	0	A		0	0
30	Point	U	0	A		0	0
33	Point	U	0	A		0	0
39	Point	U	0	A		0	0
45	Point	U	0	A		0	0
46	Point	U	0	A		0	0
47	Point	U	0	A		0	0
51	Point	U	0	A		0	0


  

Score	Side	Match_addr	X	Y	LeftFrom	LeftTo	RightFrom
82.4463	L	1313 NATIONAL HWY, CUMBERLAND, MD, 21502	-7...	39...	1319	1301	1318
53.4141	L	1321 NATIONAL HWY, CUMBERLAND, MD, 21502	-7...	39...	1339	1321	1338
53.3056	L	1299 NATIONAL HWY, CUMBERLAND, MD, 21502	-7...	39...	1299	1251	1298
53.0888	L	1341 NATIONAL HWY, CUMBERLAND, MD, 21502	-7...	39...	1383	1341	1382
52.4653	R	1249 NATIONAL HWY, CUMBERLAND, MD, 21502	-7...	39...	1162	1248	1163
50.9744	R	1161 NATIONAL HWY, CUMBERLAND, MD, 21502	-7...	39...	1122	1160	1103
49.9443	R	1101 NATIONAL HWY, CUMBERLAND, MD, 21502	-7...	39...	1074	1120	1075
49.4835	R	1073 NATIONAL HWY, CUMBERLAND, MD, 21502	-7...	39...	1062	1072	1063

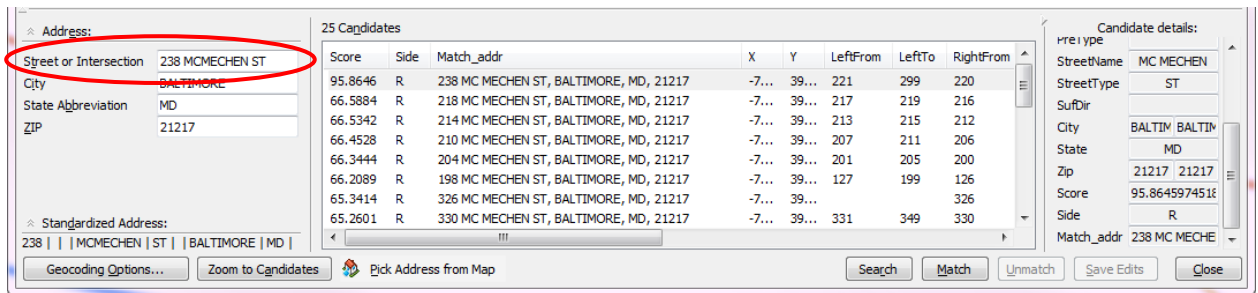
- To help orient yourself, you can add a street layer for reference. Click Add Data and in the same folder where you found the address locator, add the street network:  streets. You want to add all feature classes to the map, and turn off everything except SDC Edge Source.
- Start with the record with FID 8, Dollar General 0874. There are candidates, but none of them has a score of 100. Search Google Maps for the original 1313 National Hwy, La Vale, MD 21502. It looks like there is a Dollar General at the address specified in the SNAP retailers table.

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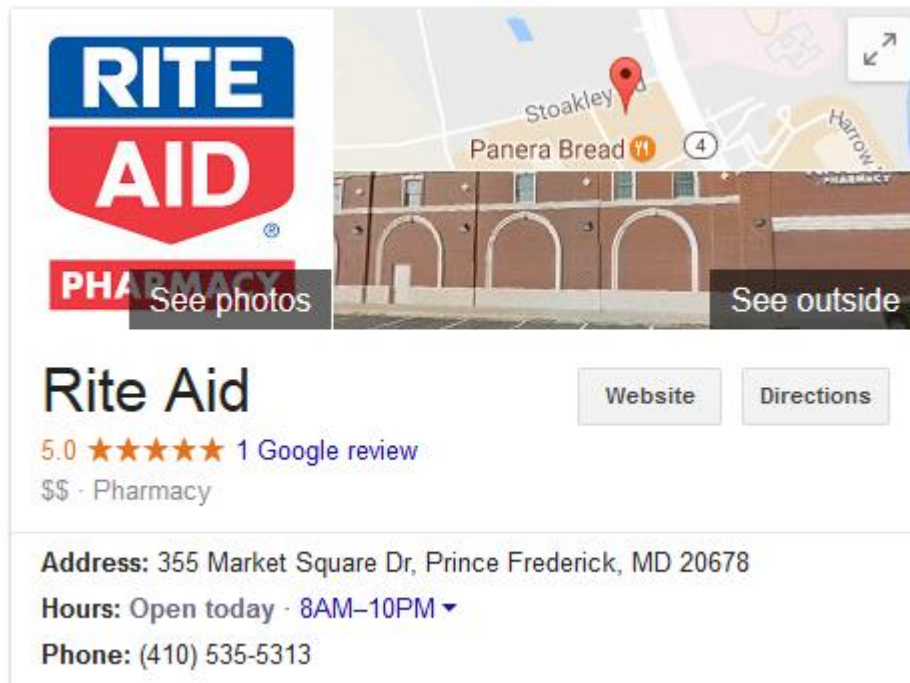
15. In the Interactive Rematch screen, select the first candidate and click Zoom to Candidates. This candidate has a different City, but let's take a closer look. If we note the location of the yellow dot – this is the location of the candidate selected. Light blue dots are other candidates in the list. You can use the identify tool  to identify the nearby streets or right click on the SDC Edge Source layer and select **Label Features**. It looks like the selected candidate is very close to the actual location. The differences in City could be the result of inaccuracies with our reference data set or because of a change in City boundaries (our reference data set is from 2006). Select the candidate and click the **Match** button.
16. Notice that the table of unmatched addresses has been updated with a new status, X/Y, and match address for this record, and the unmatched count decreased from 911 to 910.
17. Move to the next address, FID 13 (Rite Aid 104). This address has a good candidate. Why was this address not matched? Click **Match** to resolve the issue.

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Score	Side	Match_addr	X	Y	LeftFrom	LeftTo	RightFrom
95.8646	R	238 MC MECHEN ST, BALTIMORE, MD, 21217	-7...	39...	221	299	220
66.5884	R	218 MC MECHEN ST, BALTIMORE, MD, 21217	-7...	39...	217	219	216
66.5342	R	214 MC MECHEN ST, BALTIMORE, MD, 21217	-7...	39...	213	215	212
66.4528	R	210 MC MECHEN ST, BALTIMORE, MD, 21217	-7...	39...	207	211	206
66.3444	R	204 MC MECHEN ST, BALTIMORE, MD, 21217	-7...	39...	201	205	200
66.2089	R	198 MC MECHEN ST, BALTIMORE, MD, 21217	-7...	39...	127	199	126
65.3414	R	326 MC MECHEN ST, BALTIMORE, MD, 21217	-7...	39...			326
65.2601	R	330 MC MECHEN ST, BALTIMORE, MD, 21217	-7...	39...	331	349	330

18. Now, select the record with the FID 28 (Lindemann's Apiary at Gay & Saratoga Streets). We can see there is a candidate for this intersection, with a Score of 66. Intersections can be geocoded as well, but will rarely have a score of 100.
19. Select this candidate and click the **Match**. The information for this record is updated.
20. Notice again that the table of unmatched addresses has been updated with a new status, X/Y, and match address for this record, and the unmatched count decreased.
21. Next, select the record with FID 30. There are no candidates for this address. If we look at the Store\_Name for this record, we can see it is Rite Aid 11199 in Prince Frederick, MD.
22. Search Google for Rite Aid in Prince Frederick, MD. Google has this store at the same address



23. This address does not exist in our reference dataset. Not all addresses are going to match during the geocoding process. We could try to place this point manually, but it is also OK to leave unmatched addresses.



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24. Spend a few minutes trying to match other unmatched addresses. Note that some addresses may be impossible to match if they are missing key information such as a street number.
25. You can easily see how rematching all unmatched records could take a significant amount of time. If you have a lot of unmatched records, standardizing and then running the process again may pick up many additional matches. If you have time, you can run the standardization tool. Please reference the "Batch 2" section in CEHI's Geocoding Best Practices 2015, located in the Resources folder on Box.
26. Click **Close** to exit the Interactive Rematch. Addresses you geocoded using the interactive rematch process will be added to your results layer automatically.
27. Edit the metadata for this file to document your geocoding process. Open the Item Description for your geocoding results layer by right clicking on the layer and going to **Data > View Item Description**. Click the **Edit** button. Enter in a summary, description, credits, and use limitation. In this case, there would be no use constraints because the data is not confidential. Make sure to note the data source, original number of records, match percent, address locator used, and your contact information.
28. Once your metadata is up to date, add the *MD\_county10\_prj\_carto.shp* shapefile from the Exercise\_Data folder. You may be able to see that the coordinate system is not correct. What would make you think this? Fix your coordinate system, and create a quick layout for your geocoded points.