



## How to Geocode and Map Data Using Google Sheets and Microsoft Excel

Summary by Kaitlyn Campbell and Hannah Steinman

This guide will walk you through the process of geocoding data using Google sheets to populate latitude and longitude coordinates where you will then be able to map your data using *Microsoft Excel 3D Map* (previously *PowerMap*). The data used for this walkthrough are from the Fayetteville (AR) Police Department calls for service <http://www.fayetteville-ar.gov/1333/Police-Fire-Dispatch-Logs>.

**IMPORTANT:** This geocoding process was made available by J. Dougherty and I. Ilyankou (2020) at <https://handsondataviz.org/> Chapter 9 → <https://handsondataviz.org/geocode.html>

To begin the geocoding process you need to open the Geocoder Google Sheet from [https://docs.google.com/spreadsheets/d/1XvtkzuVyQ\\_7Ud47ypDJ4K0mz\\_5lOpC9sqeEDBbJ5Pbg/edit#gid=0](https://docs.google.com/spreadsheets/d/1XvtkzuVyQ_7Ud47ypDJ4K0mz_5lOpC9sqeEDBbJ5Pbg/edit#gid=0)

1. Once you have followed the link above for the geocoder, go to **File -> Make a Copy**. You will then copy and paste your address data from your original dataset (not yet geocoded) into the **Location** column of the copied Google Sheet.

The screenshot shows a Google Sheet titled "Geocoder US Census or Google (go to File > Make a Copy)". The "File" menu is open, and "Make a copy" is highlighted. Below the menu, a table displays geocoded data with the following columns: Latitude, Longitude, Found, Quality, and Source.

	B	C	D	E	F
	Latitude	Longitude	Found	Quality	Source
	41.745167	-72.69263	300 SUMMIT ST	Match	US Census
	41.766792	-72.72875	4 FREDERICK R	Match	US Census
	38.889812	-77.00592	E CAPITOL ST N	Match	US Census
	49.2613746	-123.2536718	2329 West Mall,	Match	Google
	25.6507892	-100.2895581	Av. Eugenio Garz	Partial Match	Google

Below the table, a list of call types and addresses is shown, with the "Address" column highlighted in red:

Call Type	Address
ASSAULT BATTERY	364 E 7TH ST 2, Fayetteville, AR 72701
ASSAULT BATTERY	W PRESERVATION DR, Fayetteville, AR 72701
ASSAULT BATTERY	5625 W RELIANCE ST, Fayetteville, AR 72701
ASSAULT BATTERY	4546 W SWEETGUM LN, Fayetteville, AR 72701
ASSAULT BATTERY	1955 W TRUCKERS DR, Fayetteville, AR 72701
ASSAULT BATTERY	1237 W MARTIN LUTHER KING JR BLVD, Fayetteville, AR 72701
ASSAULT BATTERY	974 W HUGHES ST X, Fayetteville, AR 72701
ASSAULT BATTERY	219 W 15TH ST, Fayetteville, AR 72701
ASSAULT BATTERY	2410 W MOUNT COMFORT RD, Fayetteville, AR 72701
ASSAULT BATTERY	100 W ROCK ST, Fayetteville, AR 72701
ASSAULT BATTERY	2638 W OLD FARMINGTON RD, Fayetteville, AR 72701
ASSAULT BATTERY	1283 N CHICKADEE AVE, Fayetteville, AR 72701
ASSAULT BATTERY	2627 N MIRANDA AVE 1, Fayetteville, AR 72701
ASSAULT BATTERY	1392 N CARLSBAD TRCE, Fayetteville, AR 72701
ASSAULT BATTERY	2008 N GREGG AVE 4, Fayetteville, AR 72701

To the right, a "Location" column is shown with a red border, containing the following addresses:

Location
364 E 7TH ST 2, Fayetteville, AR 72701
W PRESERVATION DR, Fayetteville, AR 72701
5625 W RELIANCE ST, Fayetteville, AR 72701
4546 W SWEETGUM LN, Fayetteville, AR 72701

2. You will then highlight all six columns (location, latitude, longitude, found, quality, and source) of your data (leave the headers out). Next, click **Geocoder**. You can choose if you want to geocode with the US census or Google (limit 1,000 geocoded addresses per day). Once you choose, you may be prompted to grant access to the geocoder. Click **Continue** and the geocoding process will begin.

## Highlight

A	B	C	D	E	F
Location	Latitude	Longitude	Found	Quality	Source
364 E 7TH ST 2, Fayetteville, AR 72701					
W PRESERVATION DR, Fayetteville, AR 72701					
5625 W RELIANCE ST, Fayetteville, AR 72701					
4546 W SWEETGUM LN, Fayetteville, AR 72701					

Geocoder [All changes saved in Drive](#)

with US Census

with Google (limit 1000 per day)

Geocoder [All changes saved in Drive](#)

with US Census

with Google (limit 1000 per day)

## Grant Access

Authorization Required

A script attached to this document needs your permission to run.

**Continue** Cancel

## Populate

Fayetteville April CFS Assault ☆ 📄

File Edit View Insert Format Data Tools Add-ons Help Geocoder All Running script [Cancel](#) [Dismiss](#)

100% \$ % .0 .00 123 Arial 10 B I A

A	B	C	D	E	F
Location	Latitude	Longitude	Found	Quality	Source
364 E 7TH ST 2, Fayetteville, AR 72701	36.055344	-94.15503	364 E 7TH ST, F	Match	US Census
W PRESERVATION DR, Fayetteville, AR 72701				No Match	US Census
5625 W RELIANCE ST, Fayetteville, AR 72701	36.08376	-94.24177	5625 RELIANCE	Match	US Census
4546 W SWEETGUM LN, Fayetteville, AR 72701	36.052177	-94.22567	4546 SWEETGU	Match	US Census
1955 W TRUCKERS DR, Fayetteville, AR 72701	36.108967	-94.183975	1955 W TRUCKE	Match	US Census
1237 W MARTIN LUTHER KING JR BLVD, Fayetteville, AR 72701	36.056805	-94.17804	1237 W MARTIN	Match	US Census
974 W HUGHES ST X, Fayetteville, AR 72701	36.076824	-94.17383	974 W HUGHES	Match	US Census

3. When using the US Census, addresses will either show **Match** meaning the coordinates were found or **No Match** meaning coordinates could not be populated. If you use *Google*, you will see **Match** or **Partial Match**. Although partial match addresses may not be accurate, you will have latitude and longitude for all addresses in your data set. \*Note: there are differences between latitude and longitude coordinates depending on the Geocoder you use, Census or *Google*, for the same address.

### Census Geocoder Output

Location			No Match	US Census
364 E 7TH ST 2, Fayetteville, AR 72701	36.055344	-94.15503	364 E 7TH ST, F. Match	US Census
W PRESERVATION DR, Fayetteville, AR 72701			No Match	US Census
5625 W RELIANCE ST, Fayetteville, AR 72701	36.08376	-94.24177	5625 RELIANCE Match	US Census
4546 W SWEETGUM LN, Fayetteville, AR 72701	36.052177	-94.22567	4546 SWEETGU Match	US Census
1955 W TRUCKERS DR, Fayetteville, AR 72701	36.108967	-94.183975	1955 W TRUCKE Match	US Census
1237 W MARTIN LUTHER KING JR BLVD, Fayetteville, AR 72	36.056805	-94.17804	1237 W MARTIN Match	US Census
974 W HUGHES ST X, Fayetteville, AR 72701	36.076824	-94.17383	974 W HUGHES Match	US Census
219 W 15TH ST, Fayetteville, AR 72701	36.048294	-94.162636	219 W 15TH ST, Exact	US Census
2410 W MOUNT COMFORT RD, Fayetteville, AR 72701	36.092632	-94.193245	2410 MT COMFC Match	US Census

### Google Geocoder Output

Location			Match	Google
1303 N ENGLAND LNK 5, Fayetteville AR, 72701	36.0809683	-94.1937708	1303 England Lir Partial Match	Google
1649 W SHADOWRIDGE DR, Fayetteville AR, 72701	36.0829193	-94.1332051	1649 Shadowridg Match	Google
1100 N COLLEGE AVE, Fayetteville AR, 72701	36.0808707	-94.1600145	1100 N College / Match	Google
1135 W CATO SPRINGS RD, Fayetteville AR, 72701	36.0413005	-94.177373	1135 W Cato Spr Match	Google
1153 N WEST END AVE C8, Fayetteville AR, 72701	36.0790807	-94.196808	1153 NW End Av Match	Google
2407 N ROBIN RD, Fayetteville AR, 72701	36.0958476	-94.1258504	2407 N Robin Rc Match	Google
1035 N BETTY JO DR 2, Fayetteville AR, 72701	36.0778735	-94.2065287	1035 N Betty Jo Match	Google
4302 N WATERSIDE CT, Fayetteville AR, 72701	36.1295902	-94.1404009	4302 North Wate Match	Google
1137 N WEST END AVE B8, Fayetteville AR, 72701	36.0790593	-94.1967705	1137 NW End Av Match	Google

4. You also have the option to geocode with US Census Geographies using [https://docs.google.com/spreadsheets/d/1xE9KwZ88c\\_kZvhZ13IF7BNwYKTJFxbfDu77sU1vn5w/edit#gid=0](https://docs.google.com/spreadsheets/d/1xE9KwZ88c_kZvhZ13IF7BNwYKTJFxbfDu77sU1vn5w/edit#gid=0). The steps are the same but there are two extra columns, **GeoID** and **Tract**. Rather than highlighting six, you will highlight eight columns. Using Census geographies allows the data to be matched by the GeoID or the Census tract/block group, making it easier to combine datasets or use your data with other data that has a GeoID or tract available. The GeoID and Tract ID allow for merging data from the Census or American Community Survey and aggregating crime counts based on Tract ID (calculate neighborhood crime counts or rates).

### Census Geocoder Output with GeoID and Tract ID

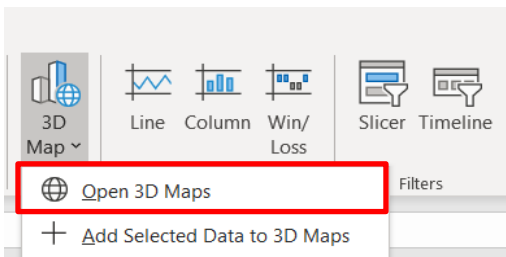
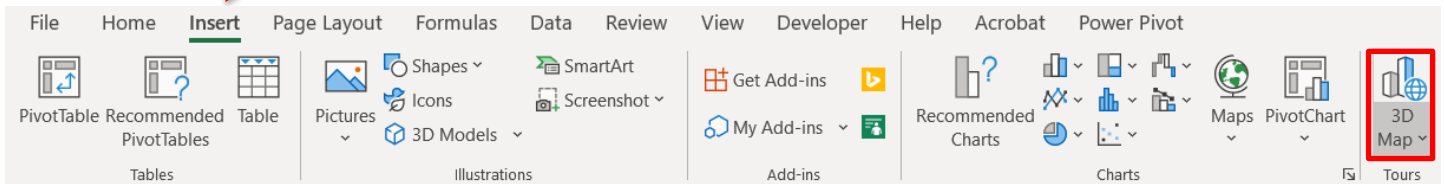
A	B	C	D	E	F	G	H
Location	Latitude	Longitude	Found	Quality	Source	GeoID	Tract
1303 N ENGLAND LNK 5, Fayetteville AR, 72701				No Match			
1649 W SHADOWRIDGE DR, Fayetteville AR, 72701	36.082664	-94.133156	1649 W SHAD	Exact	US Census 2010	051430101041001	101.1
1100 N COLLEGE AVE, Fayetteville AR, 72701	36.0773	-94.15708	1100 N COLLE	Match	US Census 2010	051430101074028	101.07
1135 W CATO SPRINGS RD, Fayetteville AR, 72701	36.041363	-94.17708	1135 W CATO	Exact	US Census 2010	051430111012047	111.05
1153 N WEST END AVE C8, Fayetteville AR, 72701	36.07858	-94.161285	1153 W END A	Match	US Census 2010	051430107022024	107.06
2407 N ROBIN RD, Fayetteville AR, 72701	36.095757	-94.126625	2407 N ROBIN	Match	US Census 2010	051430101072009	101.07
1035 N BETTY JO DR 2, Fayetteville AR, 72701	36.07723	-94.20608	1035 N BETTY	Match	US Census 2010	051430105061004	105.21

The next half of the guide will walk you through mapping your newly coordinated data using **Microsoft Excel 3D Map**. You will need to move your data to excel to begin.

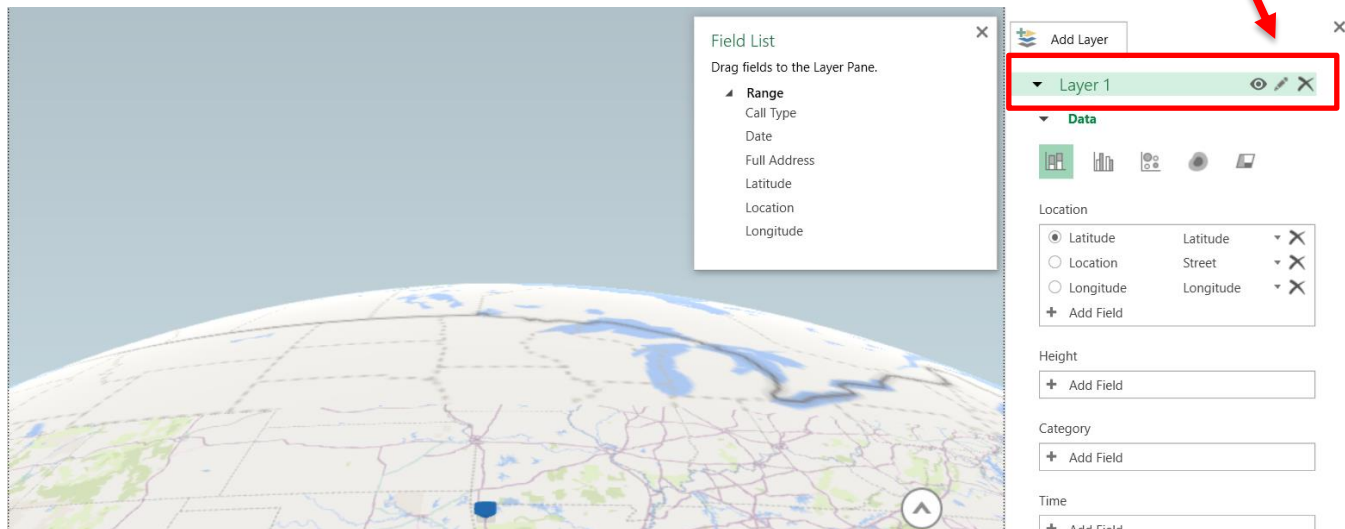
**Note:** Excel can map data based on address information only and does not require latitude and longitude coordinates. Unfortunately, this function is not available for Mac machines.

5. After you copy your data from the *Google Geocoder* Sheet to Excel, highlight your data with the coordinates, go to the **Insert tab**, click **3D Map**, then click **open 3D maps**. A new window will open with your data. Be sure to name your layer on the right side of your screen.

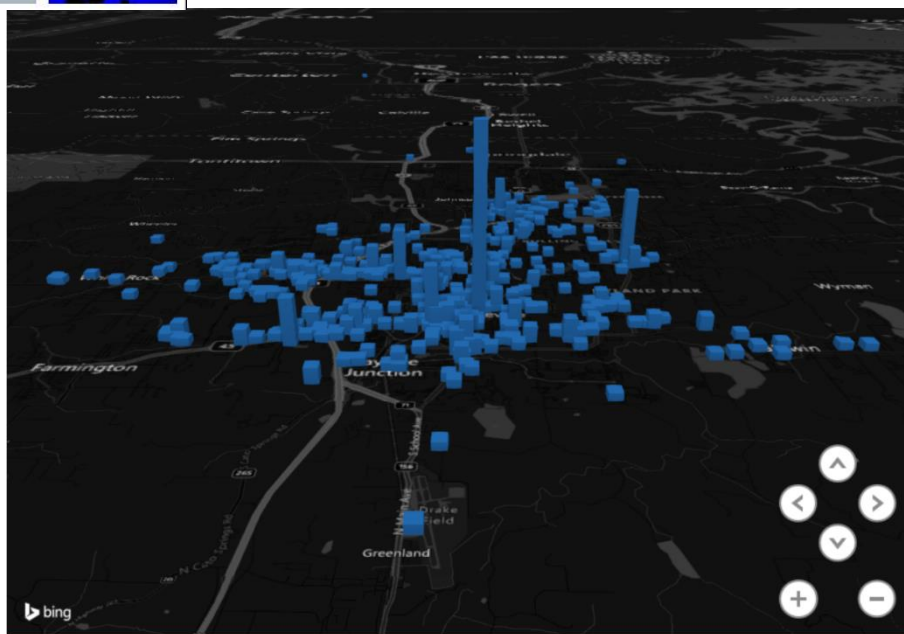
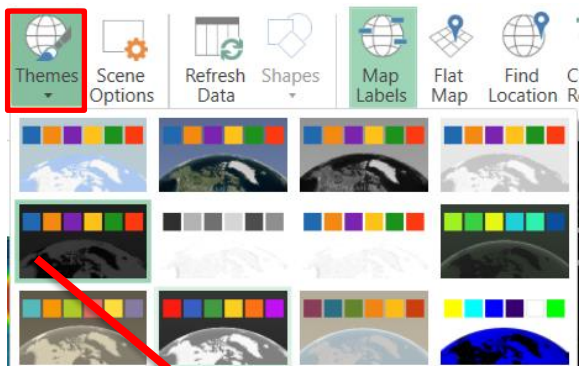
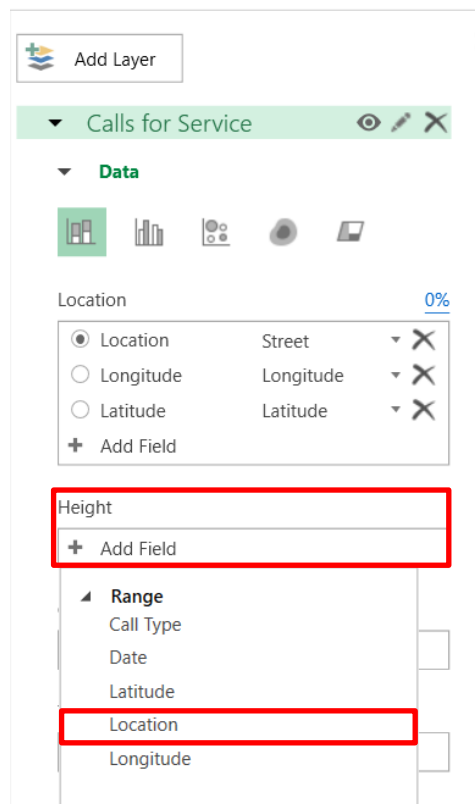
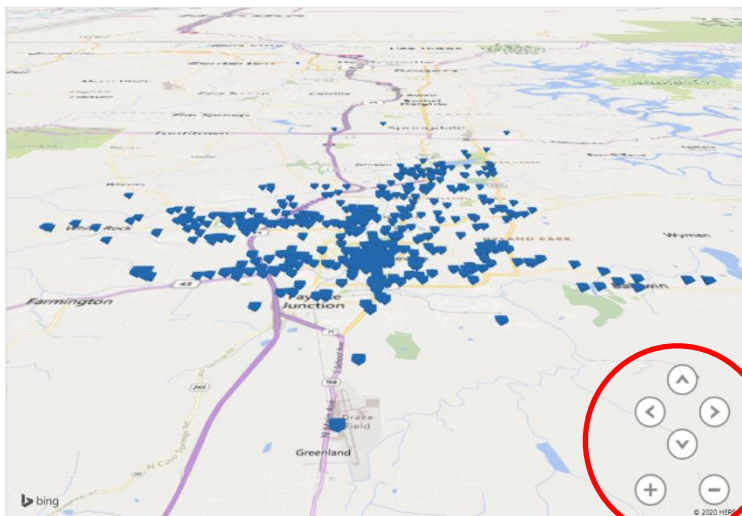
Date	Call Type	Location	Latitude	Longitude
04-01-2020   00:02:00	NOISE	1303 N ENGLAND LNK 5, Fayetteville	36.08097	-94.1938
04-01-2020   00:03:51	NOISE	1649 W SHADOWRIDGE DR, Fayette	36.08292	-94.1332
04-01-2020   00:17:08	CODE 6	1100 N COLLEGE AVE, Fayetteville A	36.08087	-94.16
04-01-2020   01:15:31	WELFARE CONCERN	1135 W CATO SPRINGS RD, Fayettev	36.0413	-94.1774
04-01-2020   01:50:28	ARMED PERSON	1153 N WEST END AVE C8, Fayettev	36.07908	-94.1968
04-01-2020   06:17:16	NOISE	2407 N ROBIN RD, Fayetteville AR, 7	36.09585	-94.1259
04-01-2020   06:17:27	WELFARE CONCERN	1035 N BETTY JO DR 2, Fayetteville /	36.07787	-94.2065
04-01-2020   06:30:57	ALARM	4302 N WATERSIDE CT, Fayetteville	36.12959	-94.1404
04-01-2020   06:47:52	CIVIL STANDBY	1137 N WEST END AVE B8, Fayettev	36.07906	-94.1968
04-01-2020   07:04:01	RECOVERY REPORT	100 W ROCK ST, Fayetteville AR, 727	36.06112	-94.1609
04-01-2020   07:17:56	ASSAULT BATTERY	364 E 7TH ST 2, Fayetteville AR, 727	36.05562	-94.155
04-01-2020   07:32:22	DISTURBANCE	140 S HILL AVE 103, Fayetteville AR,	36.06187	-94.1692
04-01-2020   07:43:38	LOITERING	2704 E MEANDERING WAY, Fayette	36.08226	-94.1233
04-01-2020   07:52:56	THEFT	1500 S SCHOOL AVE, Fayetteville AR	36.04781	-94.164



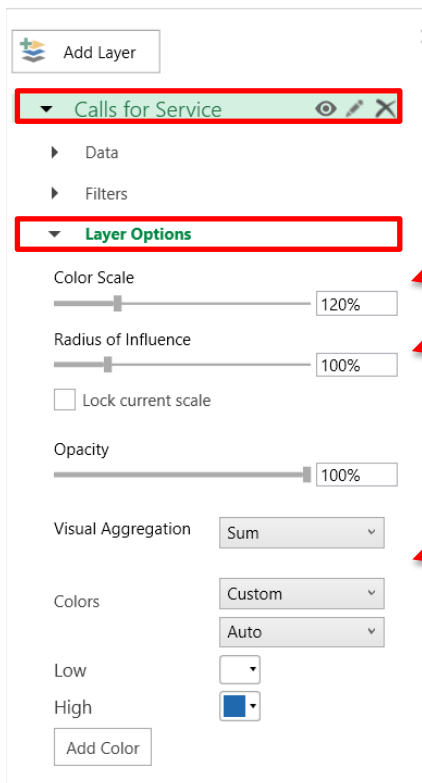
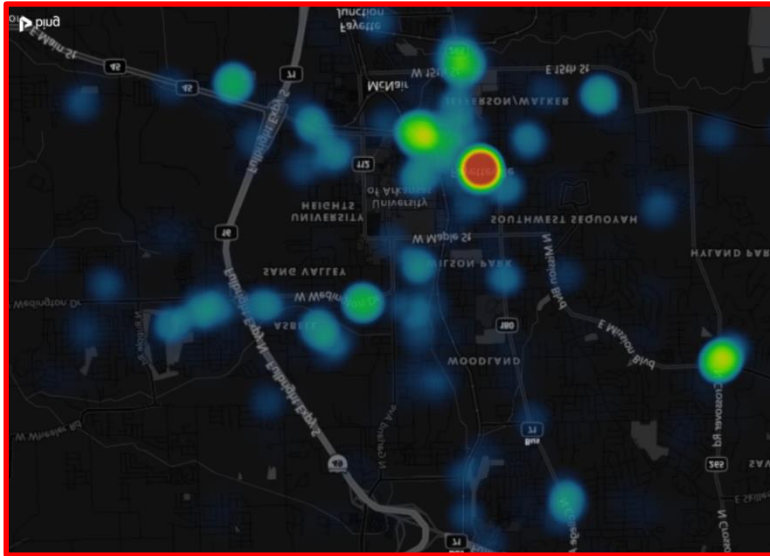
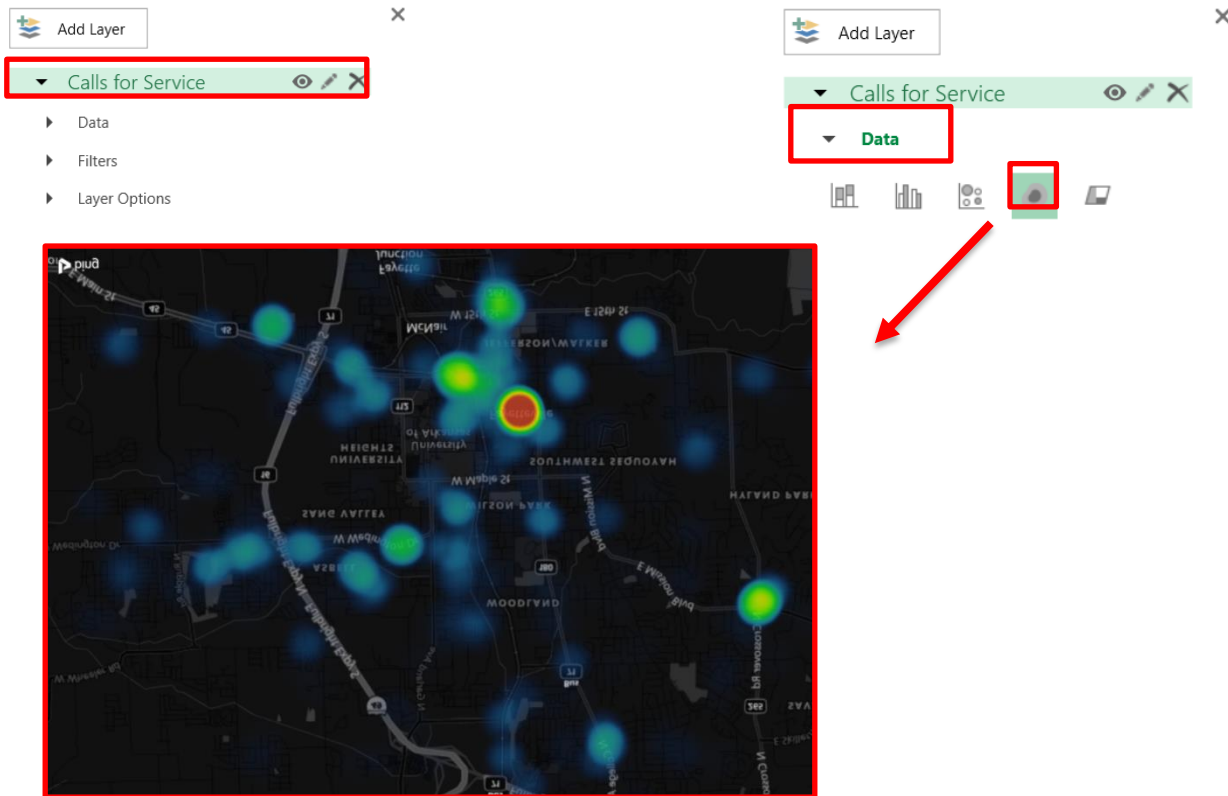
**Name your layer**



6. You will see that your data fields populated (column names). You can toggle the view with the arrows on the map, zoom in to take a closer look at your data. If you want to see how many calls are made at a location, go to your layer pane on the right of the screen, under **Height** click **Add Field** and choose **Location**. You can also change the color scheme of your map by going to **Themes** in the Home pane.



7. You can also change the way that your data are displayed. Go to your layer pane, click the layer you want to change, click **Data**, and choose the visualization you would like. **Heat Map** was used for this example, more commonly known as a hotspot map. To change the color scheme or radius of the heat map, go to the layer pane, click the layer, and then **Layer Options**. You can adjust the scale, radius, and color scheme of your map.



Scale  
Radius  
Color

8. Next, you should add a title and legend to your map. To add a title, click **Text Box** on the Home pane. The Add Text Box will appear where you can then title your map. To add a legend, click **Legend**, also listed on the Home pane.

The image illustrates the process of adding a title and legend to a map. It shows the 'Insert' menu with 'Text Box' and 'Legend' options highlighted. Below are the 'Add Text Box' dialog and a legend for 'Calls for Service' with a color scale from 1.00 to 24.00. The final map shows a heatmap of calls in Fayetteville AR with a title and legend.

**Add Text Box**

Segoe UI 36 B I [Icons]

TITLE

DESCRIPTION

**Calls for Service**

Location (Count - Not Blank)

1.00 or Less 24.00 or More

**Fayetteville AR, Calls for Service**

First week of April 2020

**Calls for Service**

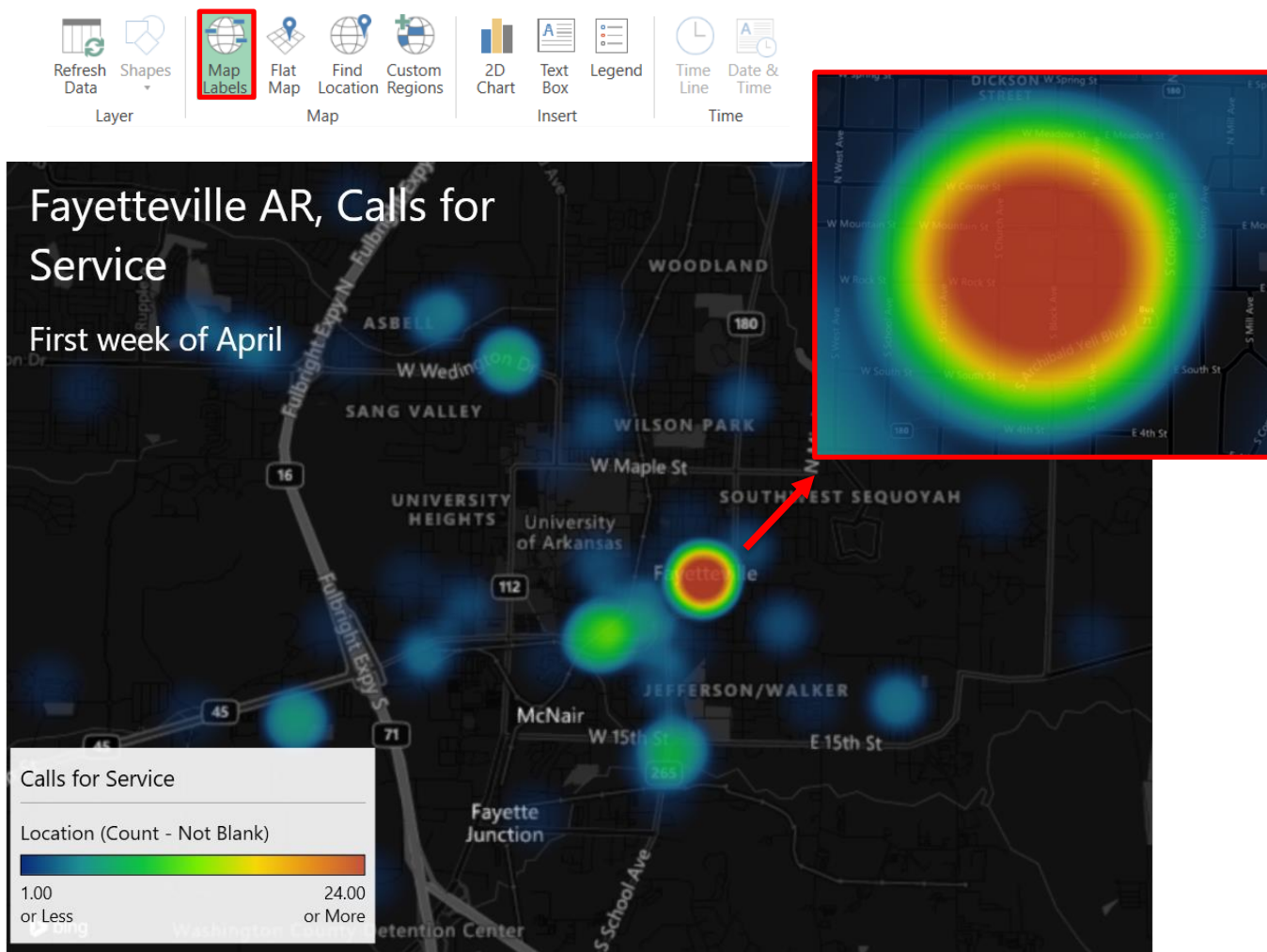
Location (Count - Not Blank)

1.00 or Less 24.00 or More

bing



9. You also have the option to turn map labels on to see street names and locations. Under the home pane click **Map Labels**. Now you can zoom in on your data and see which streets or areas have the most calls for service.



**You now know how to geocode and map your data!**