# Creating GeoJSONs For Moonbase and ADA

A geoJSON is a collection of geographical features such as coordinate points. They have a wide variety of use cases within SWX. For example, we can link Stellantis vehicles to a geofence (which is just a geoJSON whose coordinate points create a closed shape on a map) so we can evaluate if those vehicles have breached the barrier of a certain geofence. Moonbase has this functionality for determining if vehicles are close to charging stations. Zonemapper also utilizes geofences. In this guide, you will learn how to properly create and process geoJSONs.

Making the GeoJSON:

First, navigate to geojson.io. Assuming you have the address of the area you want to set up a geofence, you can enter said address into the search bar on the top right of the screen. Otherwise, the interactive map can be manually adjusted to find the area you want. Once you have located your target area, look to the toolbox on the right side of the screen. You will see a variety of icons, but you want to use the polygon tools (shown in the figures below).
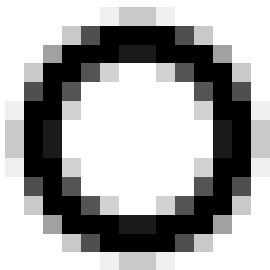

Circular Polygon Tool
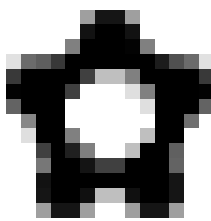
Draw Polygon Tool
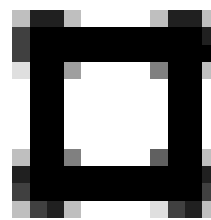
Rectangular Polygon Tool

These three tools will create a Polygon object, which is essentially just an array of tuples containing the latitude and longitude coordinates of each point you put on the map. You will want to use the polygon tools if you are creating a geofence that vehicles can enter and exit.

Additionally, there is another tool called "Draw LineString". While this seems like a more precise way to create your geofence, this actually creates an object called a LineString. LineStrings and Polygons are very different in application. You can breach the boundary of a polygon, but you cannot breach the boundary of a LineString. This is because a polygon generates a linear ring, which represents the boundary of the zone you created. LineStrings are good for making routes to follow, but not for making geofences. LineStrings **will not** work for creating a geofence, so use polygons instead.

When creating the polygon object, you will see an orange dotted line get created when you add the first point onto the map. Add as many points as you like on the map, but make sure the last point you add lands on top of the first point you made. Hitting enter will replace the dotted orange line with a green solid line and the area inside the polygon will turn green. This indicates that you have created a valid polygon object. The two screenshots below demonstrate this process.
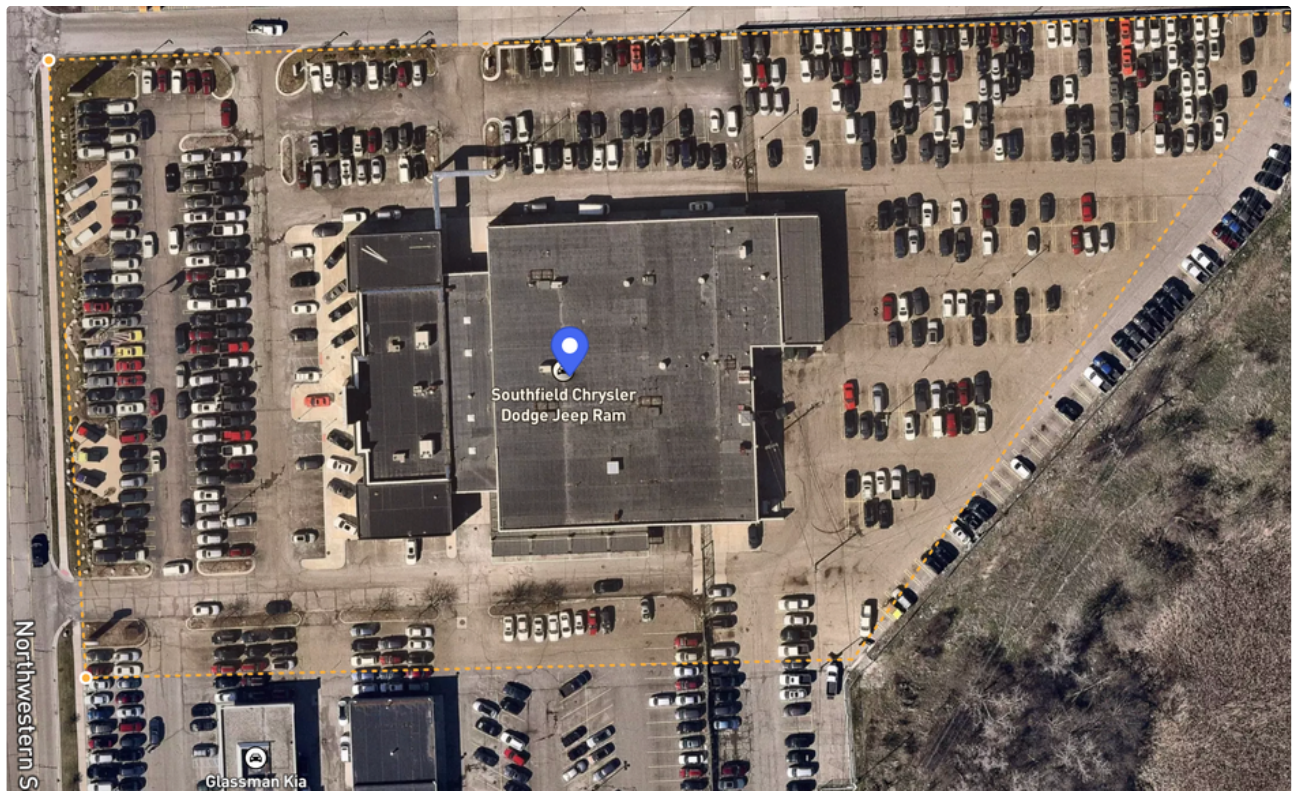
Polygon Outline In Dotted Orange

Closed Polygon Filled With Green

Processing The GeoJSON:

You will notice that after you have placed your polygon on the map there will be a geoJSON that appears in the box to the right of the map. Go ahead and copy that geoJSON and paste it into this whitespace remover tool. Remove all the whitespace from the geoJSON and copy the result. Then paste that into this JSON escape tool. Make sure you escape the geoJSON, not unescape it. After that, you have successfully created a usable GeoJSON!

Uploading the GeoJSON:

Now that you have your geoJSON processed, you are going to want to upload it to an ADA policy. In order to do this, you should go to the ADA environment your policy is in (most likely in dev). Use the navigation menu on the left side of the screen to find the policies tab and enter the policy ID in the field. In the policy plans, you should see a bit of JSON that looks similar to the code snippet below:

```
 1  "data": [
 2        {
 3            "name": "geofence_name",
 4            "operands": [
 5              {
 6                  "param": "Longitude",
 7                  "source": "location"
 8              },
 9              {
10                  "param": "Latitude",
11                  "source": "location"
12              }
13            ],
14            "source": "geo-fence",
15            "param": "{\"type\":\"FeatureCollection\",\"features\":[{\"type\":\"Feature\",\"properties\":{},\"geom
16        }]
```

Adding your geofence to the policy is easy. Each geofence needs every field you see above. You need to give your geofence a unique name, specify latitude and longitude fields, and the geoJSON that you made. You can copy everything inside data and paste it below the policy in ADA. Change the name of the geofence and the geoJSON in your geofence object. Congratulations, you have successfully created and added your geofence to your policy!