

Recipe to open a new restaurant in Madrid

The 'What': opening a new Ka'i in the city

I always wanted to open one of our Paraguayan restaurants in Madrid. We have been successful in other similar cities with our cuisine around the world. Since our country is rather not very well known and mostly undiscovered for many people, our exotic dishes in restaurant Ka'i (the monkey in Guaranian, our native language) are a sweet surprise for everyone.



Image: Ka'i ladrillo, typical dessert from Paraguay (source: Pinterest)

Chipa pirú, sopa paraguaya, chipaguazú, our awesome meats and of course desserts like alfajores and the unforgettable [ka'i ladrillo](#). All compelling and stunning new meals in Madrid. But then, having the 'what' we needed a 'where'

The 'Where'

When it turned out to choose a location for the restaurant, my brother and I met with Almudena Costa, a young consultant expert in new openings for food and drink businesses with a strong background in what she called ['location intelligence'](#) with her nice Spanish accent.

We have always pretty clear three guidelines for a new city's opening: proximity, luxury and family environment. I would say the ambient in our Ka'i restaurants is family exclusive luxury with the touch of our exotic, unknown culture from Paraguay.

Almudena talked about our three points as key elements within a wider decision making system she called 'multicriteria decision analysis' ([MCDA](#) or MCA). At first, when she referred to spatial term we got confused about NASA and astronauts choosing our location from outer space.

Nevertheless, she explained to us she meant to use a spatial analysis SaaS called [CARTO](#). Then we started to see some nice maps on her tablet screen.

- **Proximity.** Metro station network is very important for the shake of commuting and spatial proximity in urban restaurants, that factor has been reinforced with recent car circulation ban in central Madrid. Areas around stations which are reachable on foot (less than 250 meter far), combined with a relative low number of other restaurants are highly desirable
- **Luxury and familiar zones.** For that two guidelines, Almudena set rental prices in real estate and population density data as the variables we were about to work with. Since the concept of family is very open as a target, there were no age segmentation in the first approach, and high sqm rental values were a nice indicator for a high economy level in the potential areas about to choose.



Image: metro stations are critical in the allocation of businesses inside cities like Madrid (source: metromadrid.es)

So, we were about to chase potential places for our restaurant in a 250m area close to metro station, high rental prices and relatively high population density areas. How we proceeded? That is better explained below, in Almudena Costa's own words.

Creating an interactive map with carto

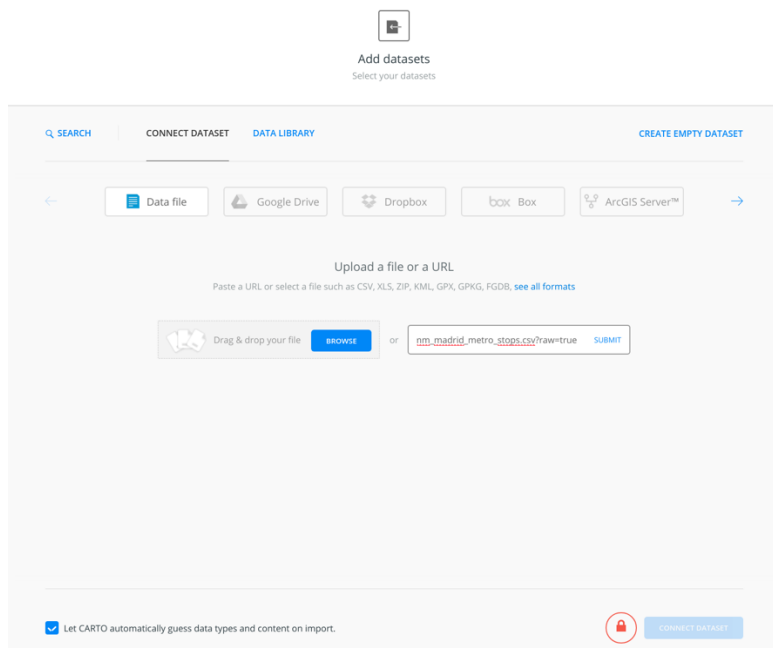
Import the datasets into your CARTO account

The first step is to import the required datasets into your CARTO account. Please, create trial account <https://carto.com/signup> as part of the hiring process.

There are 5 datasets you need to import:

1. **pmm_madrid_demographics.csv**
2. **pmm_madrid_metro_lines.csv**
3. **pmm_madrid_metro_stops.csv**
4. **pmm_madrid_pois.csv**
5. **pmm_madrid_real_estate.csv**

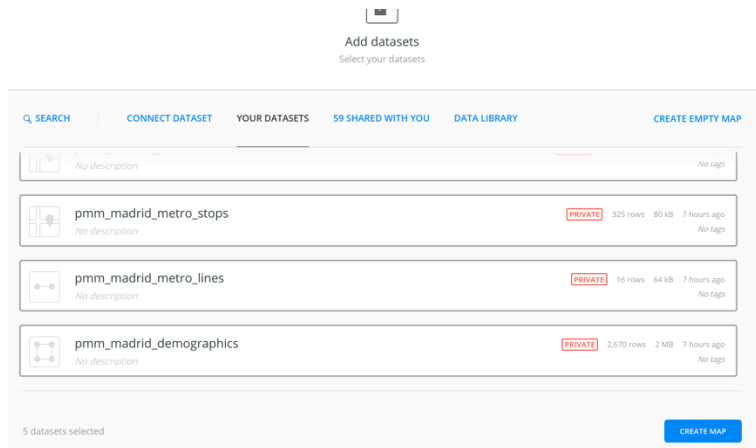
For each of them, copy the URL (or upload directly from the dataset in .zip provided in the platform) and use Builder's new dataset dialog to get the import done:



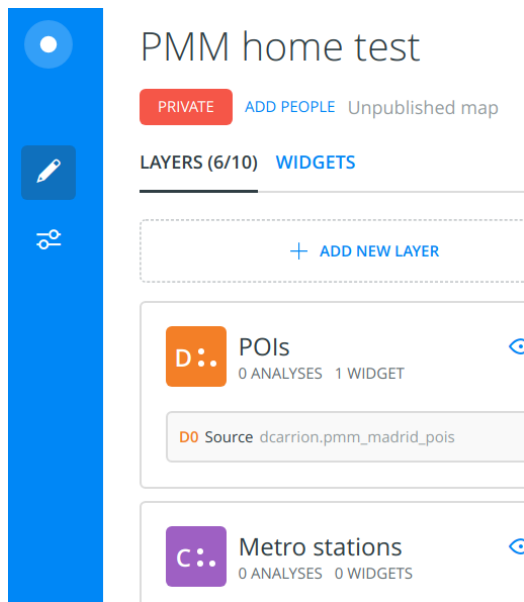
After one dataset is imported, it typically helps to preview it to verify everything looks good.

Create the map

Create a new map with the 5 datasets that were previously uploaded.



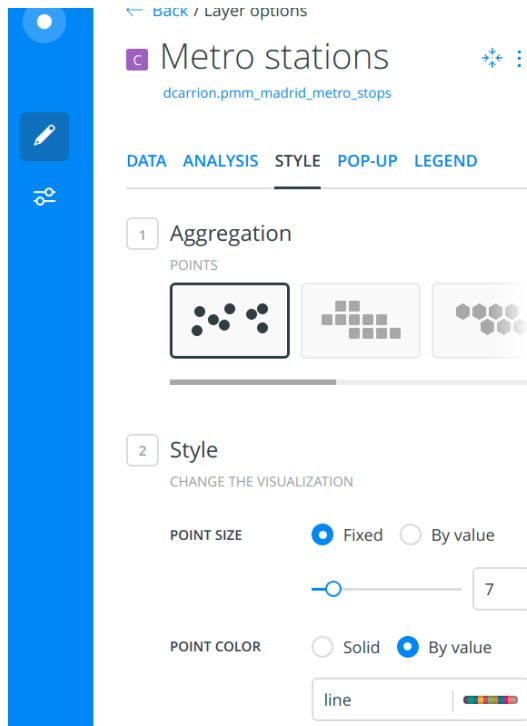
It is advisable to rename the map and the layers, for the sake of clarity.



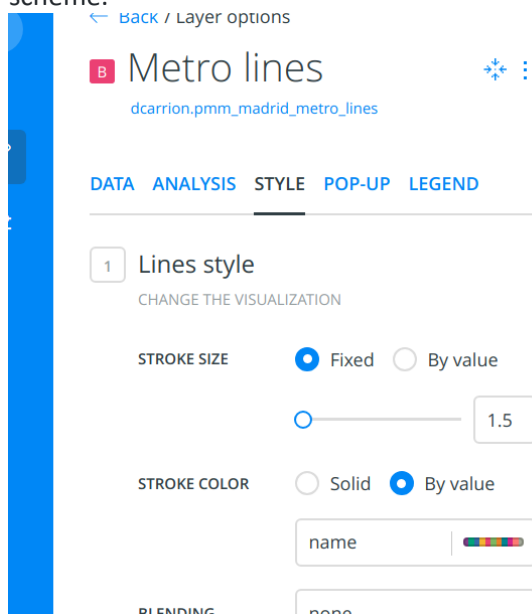
Style metro layers

Now it is time to start styling the layers. We will start with the metro stations and metro lines layers. We recommend you hide the rest of the layers while working on this.

In Builder, click on the metro stations layer and go to the STYLE tab. Select By value on the POINT COLOR subsection, using line as the column name, and pick a color scheme.



Repeat the same process for the metro lines layer, by Select By value on the STROKE COLOR section, using name as the column name, and make sure you pick the same color scheme.



Notice how the colors for the metro lines and the metro stations do not match. Why is that?

In order to have the same color in both layers, copy this CARTOCSS into the STYLE tab for the metro stations:

```
#layer {  
  marker-width: 7;  
  marker-fill: #FFB927;  
  marker-fill-opacity: 0.9;  
  marker-line-color: #FFF;  
  marker-line-width: 1;  
  marker-line-opacity: 1;  
  marker-type: ellipse;  
  marker-allow-overlap: true;  
}  
  
#layer[line='L1'] {  
  marker-fill: #30a3dc;  
}  
  
#layer[line='L2'] {  
  marker-fill: #cd031d;  
}  
  
#layer[line='L3'] {  
  marker-fill: #ffe114;  
}  
  
#layer[line='L4'] {  
  marker-fill: #944248;  
}  
  
#layer[line='L5'] {  
  marker-fill: #96bf0d;  
}  
  
#layer[line='L6'] {  
  marker-fill: #a0a5a7;  
}  
  
#layer[line='L7'] {  
  marker-fill: #faa64a;  
}  
  
#layer[line='L8'] {  
  marker-fill: #f27ca2;  
}  
  
#layer[line='L9'] {  
  marker-fill: #a93094;  
}  
  
#layer[line='L10'] {  
  marker-fill: #084594;  
}  
  
#layer[line='L11'] {  
  marker-fill: #008b43;  
}  
  
#layer[line='L12'] {  
  marker-fill: #a49a00;  
}  
  
#layer[line='L14'] {  
  marker-fill: #00aa66;  
}  
  
#layer[line='R'] {  
  marker-fill: #0e4a97;  
}  
  
#layer[line='ML1'] {  
  marker-fill: #0066ff;  
}
```

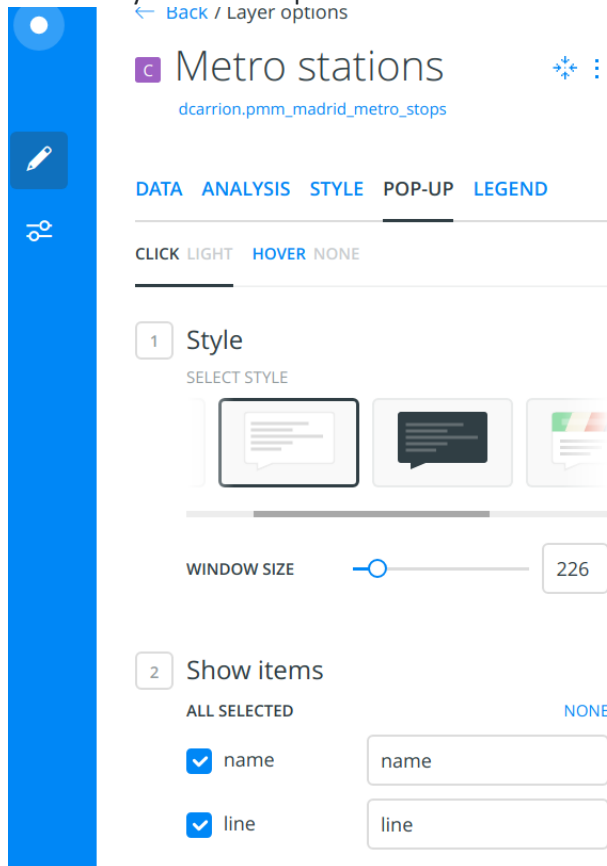
```
#layer[line='ML2'] {  
  marker-fill: #892ca0;  
}  
  
#layer[line='ML3'] {  
  marker-fill: #ff0000;  
}
```

And use this CARTOCSS for the metro lines layer:

```
#layer {  
  line-color: #fff;  
  line-width: 2;  
  line-opacity: 1;  
}  
  
#layer[name='L1'] {  
  line-color: #30a3dc;  
}  
  
#layer[name='L2'] {  
  line-color: #cd031d;  
}  
  
#layer[name='L3'] {  
  line-color: #ffe114;  
}  
  
#layer[name='L4'] {  
  line-color: #944248;  
}  
  
#layer[name='L5'] {  
  line-color: #96bf0d;  
}  
  
#layer[name='L6'] {  
  line-color: #a0a5a7;  
}  
  
#layer[name='L7'] {  
  line-color: #faa64a;  
}  
  
#layer[name='L8'] {  
  line-color: #f27ca2;  
}  
  
#layer[name='L9'] {  
  line-color: #a93094;  
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#layer[name='L10'] {  
  line-color: #084594;  
}  
  
#layer[name='L11'] {  
  line-color: #008b43;  
}  
  
#layer[name='L12'] {  
  line-color: #a49a00;  
}  
  
#layer[name='L14'] {  
  line-color: #00aa66;  
}  
  
#layer[name='R'] {  
  line-color: #0e4a97;  
}
```

```
#layer[name='ML1'] {  
  line-color: #0066ff;  
}  
  
#layer[name='ML2'] {  
  line-color: #892ca0;  
}  
  
#layer[name='ML3'] {  
  line-color: #ff0000;  
}
```

Finally, make the stations and lines clickable by adding pop-ups to both layers, using the name column for the metro lines layer and the name and line columns for the metro stations layer. For example:



Create catchment areas around metro stations

We are interested in studying the areas that are close to metro stations, as we acknowledge their commercial potential.

Ideally, we would be interested in defining the boundaries of those areas based on whether it takes less than a 5-minute walk to get there. Because of technical limitations on the trial CARTO accounts, it is safer to use plain distance in meters. So we would approximate those areas and use 250m-radius circles ("buffers") instead.

To do that, we need to run a Create Travel/Distance Buffers analysis on the metro stations layer:

← Back / Layer options

Metro stations

dcarrión.pmm_madrid_metro_stops

DATA ANALYSIS STYLE POP-UP LEGEND

+ ADD NEW ANALYSIS

C1 Create Travel or Distance Buffers INFO

1 Define your parameters

TUNE YOUR ANALYSIS

BASE LAYER C0 Source pmm_madri...

TYPE ☒ Distance ☐ Time

UNITS ☒ m ☐ km ☐ mi

RADIUS

TRACKS

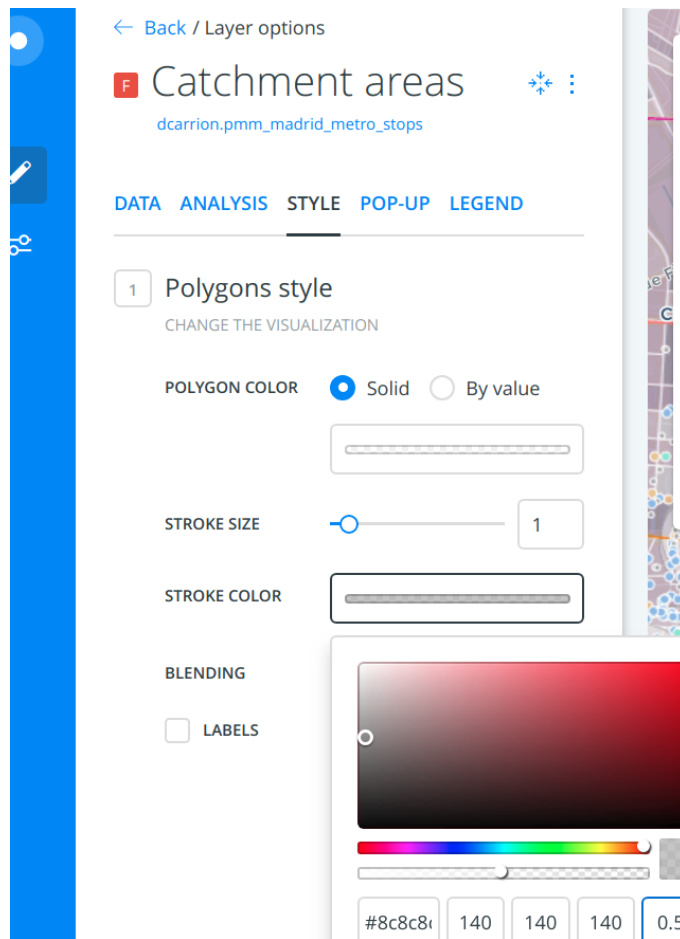
BOUNDARIES ☒ Intact ☐ Dissolved

Once the analysis has finished, we will drag and drop it from inside the metro stations layer so that it becomes an independent layer and we can recover the original stations. It is also a good idea to rename the new layer.

Metro stations
0 ANALYSES 0 WIDGETS
C0 Source dcarrión.pmm_madrid_metro_stops

Catchment areas
1 ANALYSIS 0 WIDGETS
F1 Create Travel or Distance Buffers
C0 Source Metro stations

Finally, let us style the layer:



POI data

We will group the POIs into 3 categories, using CARTOCS:

```
#layer {
  marker-width: 4;
  marker-fill: #a6a6a6;
  marker-fill-opacity: 0.9;
  marker-allow-overlap: true;
  marker-line-width: 1;
  marker-line-color: #FFF;
  marker-line-opacity: 1;
}

#layer {
  [amenity='bar'], [amenity='pub'], [amenity='nightclub'] {
    marker-width: 6;
    marker-fill: #88b6ea;
    marker-fill-opacity: 0.9;
    marker-allow-overlap: true;
    marker-line-width: 1;
    marker-line-color: #FFF;
    marker-line-opacity: 1;
  }
}

#layer {
  [amenity='cafe'], [amenity='fast_food'] {
    marker-width: 6;
    marker-fill: #eac688;
    marker-fill-opacity: 0.9;
    marker-allow-overlap: true;
  }
}
```

```
marker-line-width: 1;
marker-line-color: #FFF;
marker-line-opacity: 1;
}
}

#layer {
  [amenity='theatre'], [amenity='cinema'], [amenity='music_venue'] {
    marker-width: 6;
    marker-fill: #88ead0;
    marker-fill-opacity: 0.9;
    marker-allow-overlap: true;
    marker-line-width: 1;
    marker-line-color: #FFF;
    marker-line-opacity: 1;
  }
}
```

Feel free to add pop-ups to this layer too.

Real Estate

For the Real Estate layer, a simple color ramp on the sqm_rental column will be enough, probably using an alpha value of around 0.3.

Feel free to add pop-ups to this layer too.

Demographics

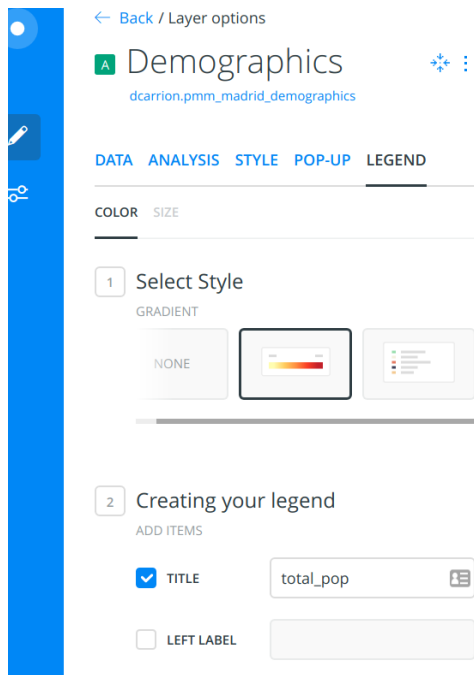
For this layer, a simple color ramp on the total_pop or total_pop_density column will be enough, probably using an alpha value of around 0.3 and avoid color collision with the Real Estate layer.

Feel free to add pop-ups to this layer too.

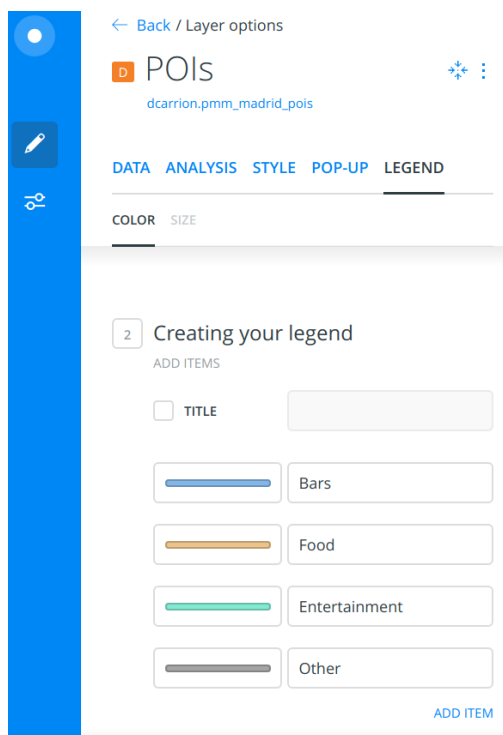
Final touches to the map

Let us re-order the layers in a way that make sense, Probably the POIs should go first. Metro stations, lines and catchment areas should go next, leaving the demographics and Real Estate layers at the bottom.

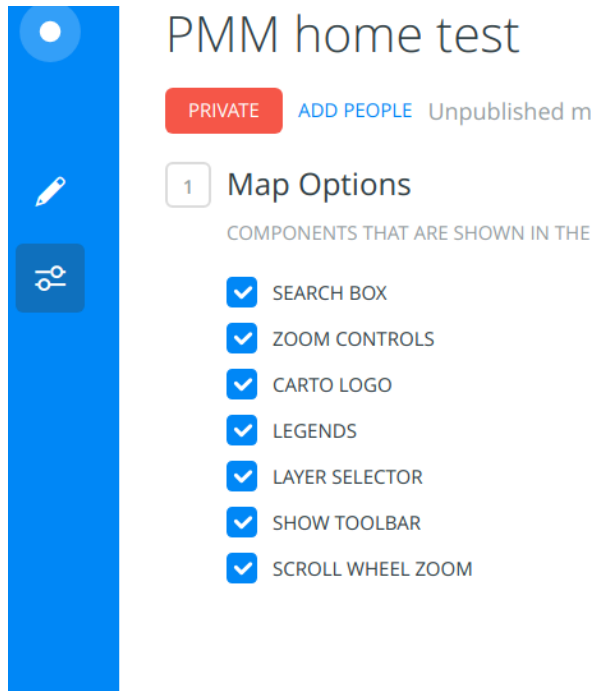
On the demographics and Real Estate layers, we will turn regular legends on. For example:



On the POI layer, we will manually copy the color values we used before to create a more custom layer:



Finally, let us add a layer selector so that the final user can switch layers on and off:



The screenshot shows the 'PMM home test' interface. On the left is a blue vertical sidebar with three icons: a circle, a pencil, and a gear. The main area has the title 'PMM home test' and a status bar with 'PRIVATE' in a red box, 'ADD PEOPLE' in blue, and 'Unpublished m'. Below this is a section titled '1 Map Options' with the subtitle 'COMPONENTS THAT ARE SHOWN IN THE'. A list of seven options follows, each with a checked checkbox: SEARCH BOX, ZOOM CONTROLS, CARTO LOGO, LEGENDS, LAYER SELECTOR, SHOW TOOLBAR, and SCROLL WHEEL ZOOM.

PMM home test

PRIVATE [ADD PEOPLE](#) Unpublished m

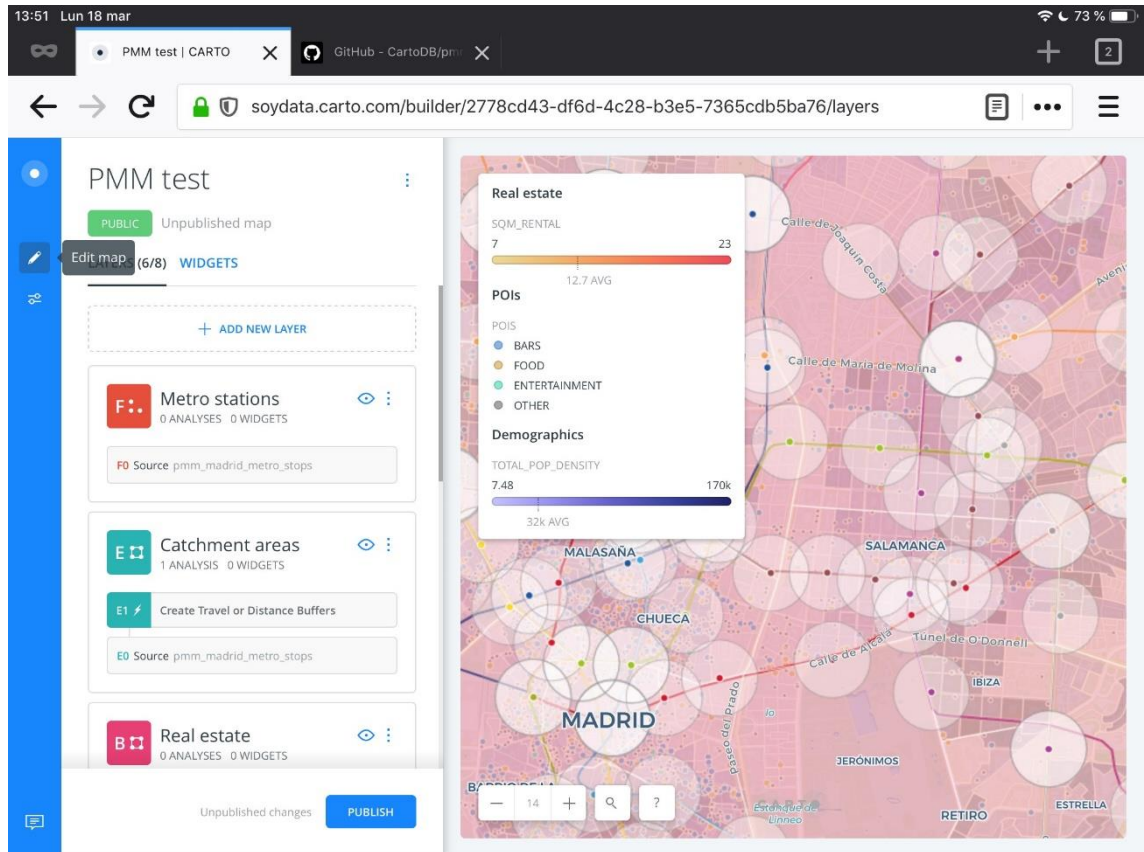
1 Map Options

COMPONENTS THAT ARE SHOWN IN THE

- ☒ SEARCH BOX
- ☒ ZOOM CONTROLS
- ☒ CARTO LOGO
- ☒ LEGENDS
- ☒ LAYER SELECTOR
- ☒ SHOW TOOLBAR
- ☒ SCROLL WHEEL ZOOM

The recipe of success: Multicriteria Decision Analysis (MCA)

We start with a map with metro lines, metro stations, POI's (points of interest), real estate and demographic layers.

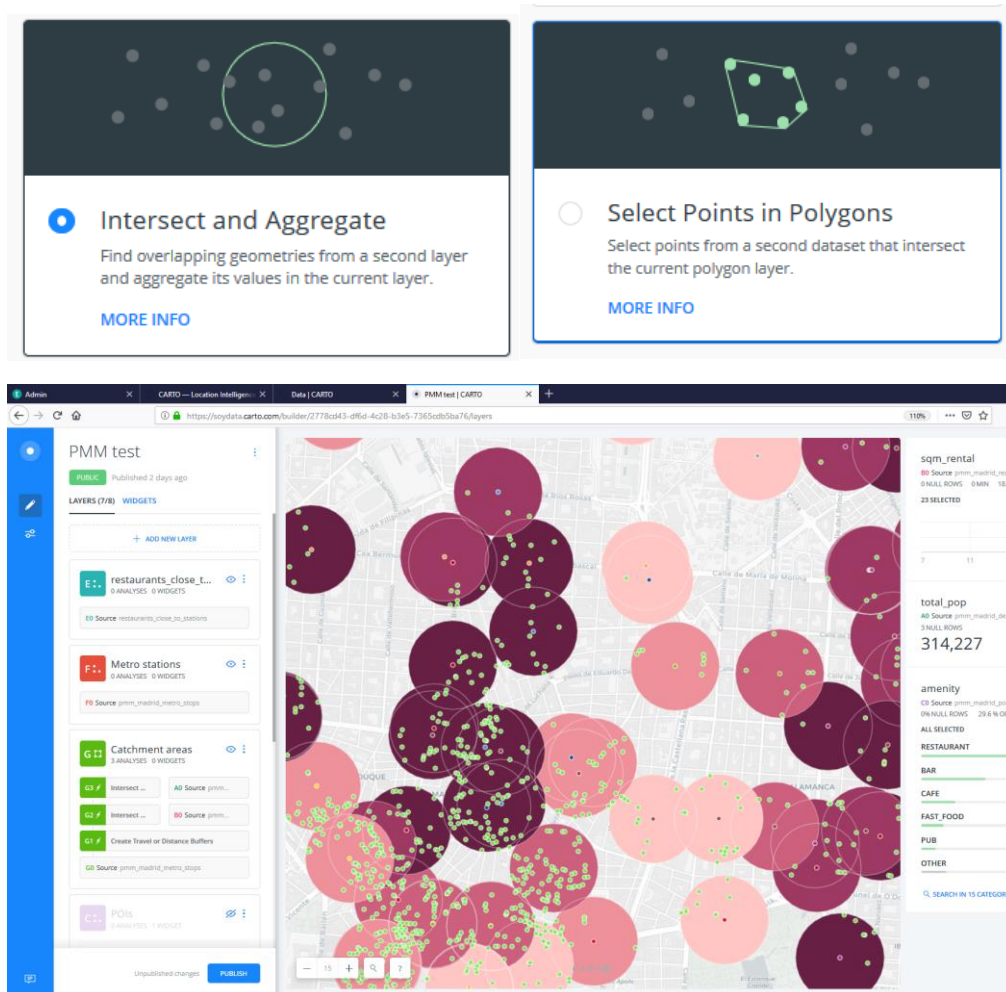


First thing we do is establishing the threshold of 250 meters around metro stations. With that spatial layer of polygons, we select from POIs all restaurants located inside the polygons (catchment areas). We process this in two steps:

-We run a query on POIs to get only restaurants (our hypothesis is other businesses like fast food or pubs are not influential with the Ka'i business)

```
1 SELECT * FROM pmm_madrid_pois WHERE amenity= 'restaurant'
```

-Then, we use the Intersect and Aggregate analysis tool in CARTO Builder to identify restaurants inside all catchment areas. Select Points in Polygons is also another choice



Now as we'd like to count how many restaurants are within any catchment area (purple circles in the image), we must add to the `restaurants_close_to_stations` datasheet (csv format) a new column with the number 1. If we want to add some weight to discriminate different types of restaurants, we could add different numbers here. We are doing the simplest way however, in this first MCA as first sprite in our project.

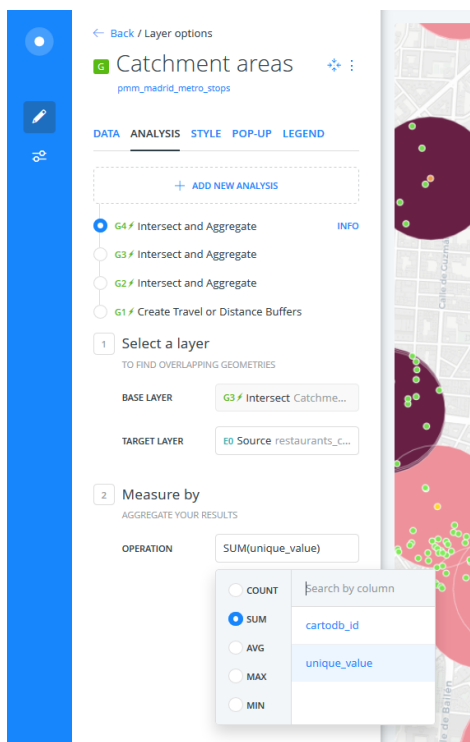
restaurants_close_to_stations
Updated a few seconds ago

cartodb_id	the_geom	name	amenity	unique_value
4	-3.7020018, 40.428732	Café Comercial	restaurant	
23	-3.709622, 40.4245836	Rey de Tallarines		
25	-3.7120848, 40.4257624	Bar Nino		
27	-3.7118533, 40.42514	Delhi		
28	-3.711541, 40.4260327	La Pomarada		
33	-3.7088306, 40.4162394	Brasa y Lefa		
44	-3.7102277, 40.4116272	El Viajero	restaurant	
115	-3.6978097, 40.4115676	Fuente de la Fama	restaurant	
148	-3.6965924, 40.4171806	El Secreto de Castilla	restaurant	
149	-3.6966034, 40.4173325	Acador Sagardi	restaurant	
151	-3.6971908, 40.416822	Vegetariano	restaurant	
161	-3.7009208, 40.4040925	La Amistad II	restaurant	
162	-3.7014847, 40.4047549	A Cañada	restaurant	
179	-3.6952969, 40.4050712	Restaurante Chino	restaurant	

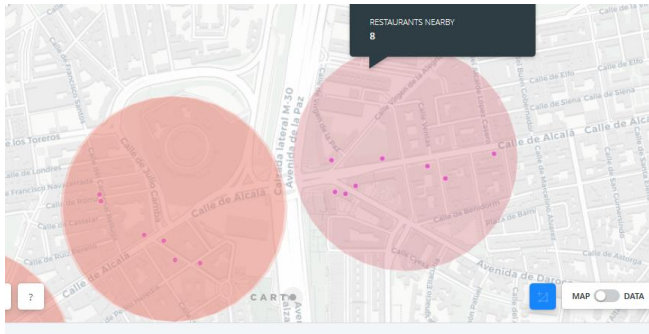
```
1 UPDATE restaurants_close_to_stations
2 SET unique_value= 1
```

METADATA ☒ SQL

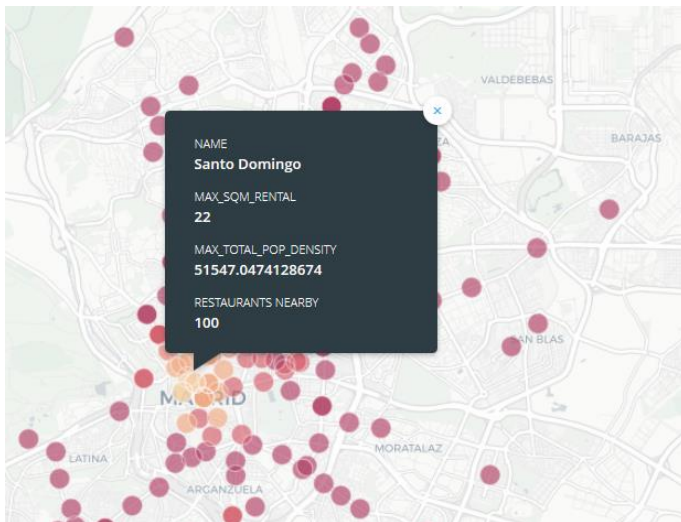
Now, with the new column `unique_value` created and filled with 1 (string data type) in every restaurant we can go further. We count the number of restaurants for every 250m circular zone around metro stations. We run again the analysis Intersect and Aggregate in the Builder, in this case with catchment areas as base layer and restaurants as target. In *measured by* section we choose SUM and select the field `unique_value` (column):



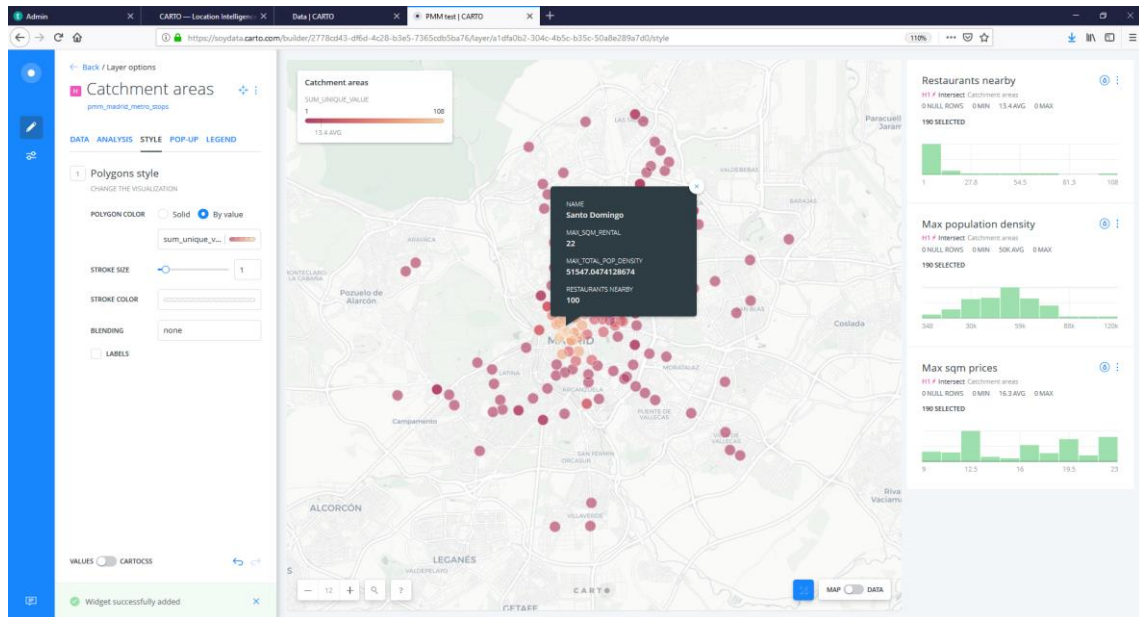
Now we can test directly in the map that values of SUM in catchment areas layers are right by matching them with the number of points inside every circle (buffer)



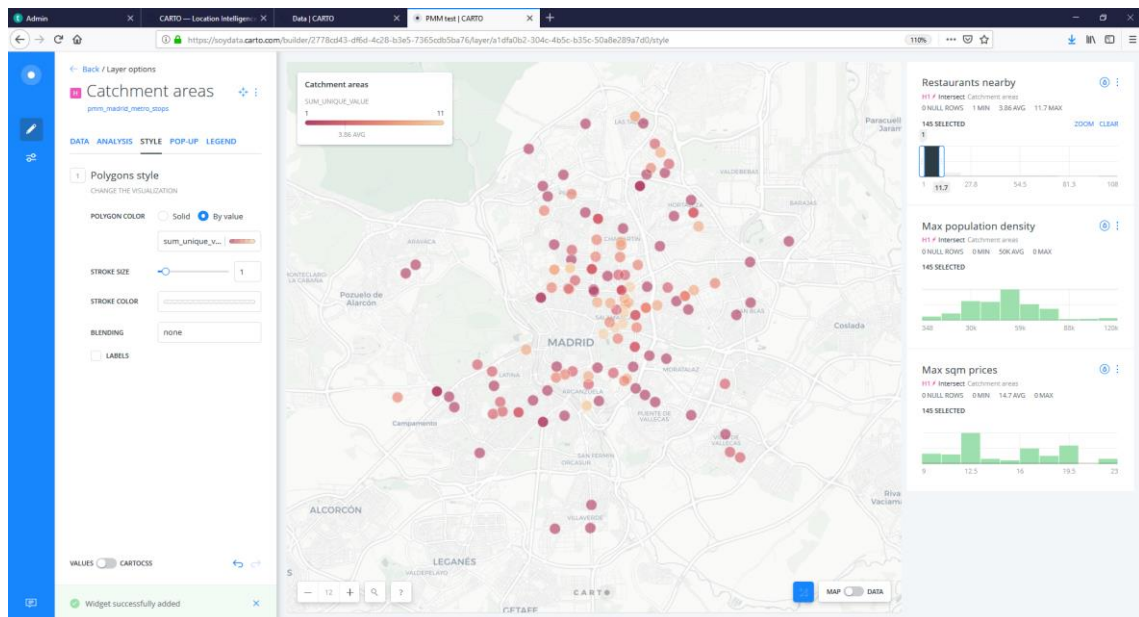
With that information we continue with population and rental price variables. We shall do the same analysis (Intersect and Aggregate), adding this time the maximum values of population density and sqm (square meter) rental on each of the catchment areas. Is more accurate to use density in population rather than absolute value, given the fact that some of the total population always relay outside the 250m circle around metro stations. Also, by choosing the maximum we just capture the high values we are looking for, although it is a first approach.

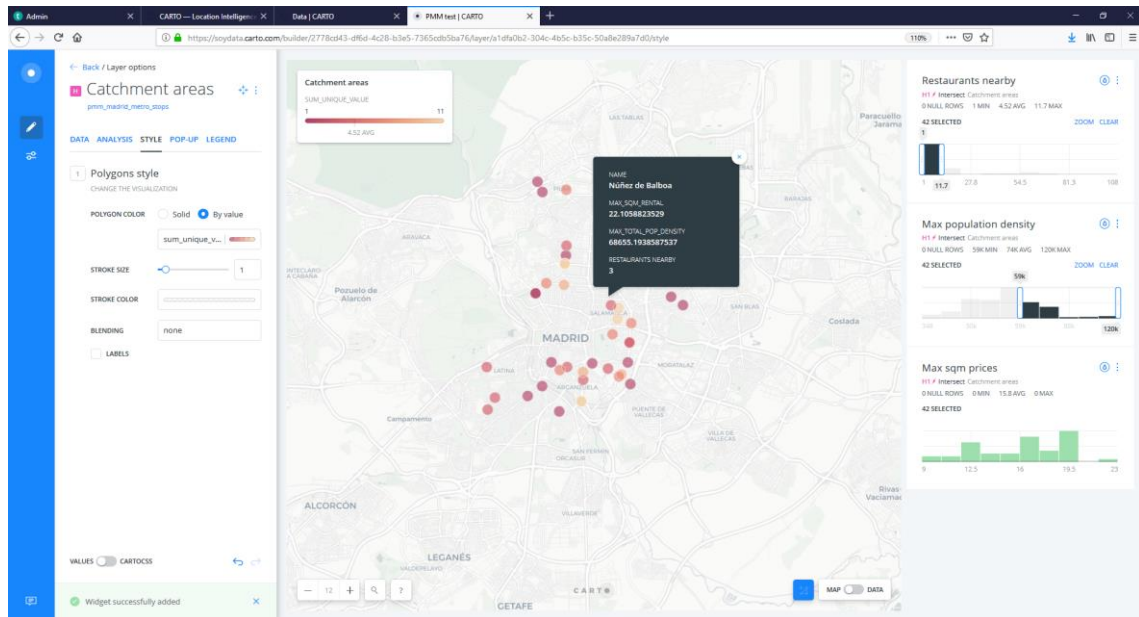


As you can see in the pop-up, we have in just one polygon layer of catchment areas information relative to population density, rental price and number of restaurants inside. Now we are going to choose the most suitable zones with the help of CARTO Builder widgets. We select three histogram widgets which are interactive with the map for each variable:

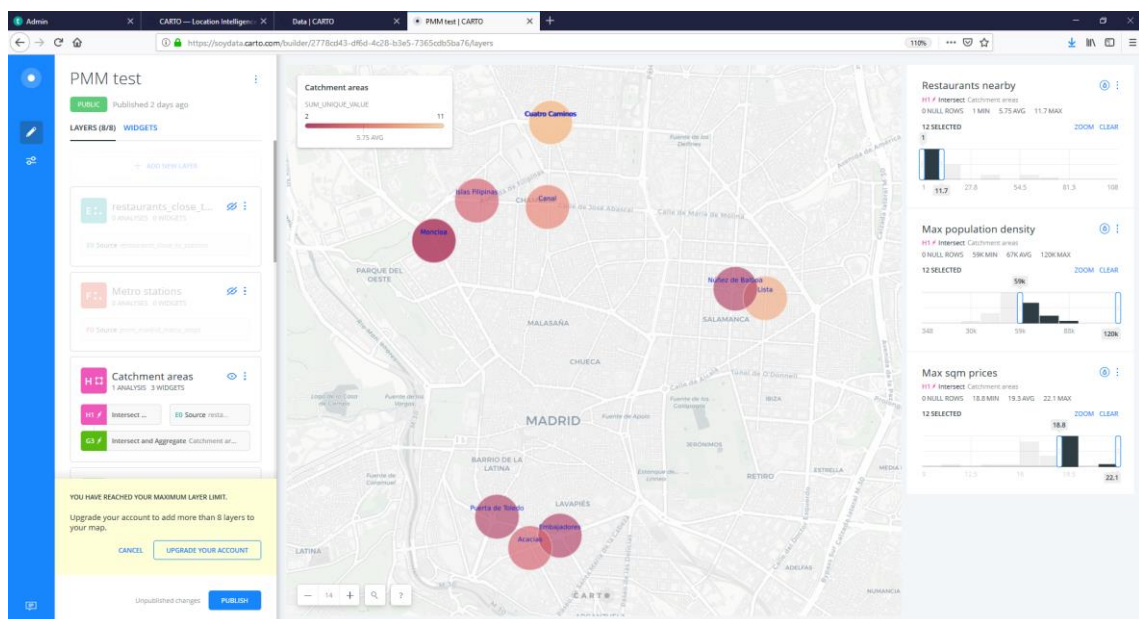


Now we are going to set ranges for values, starting with the number of restaurants nearby, in a sort of setting thresholds on each variable. Notice once we select a range of values on a given widget, the rest of histograms in the remain widgets will change. Thereby, the order of variable selection must be a sort of hierarchy. We propose restaurants, population and sqm rental.

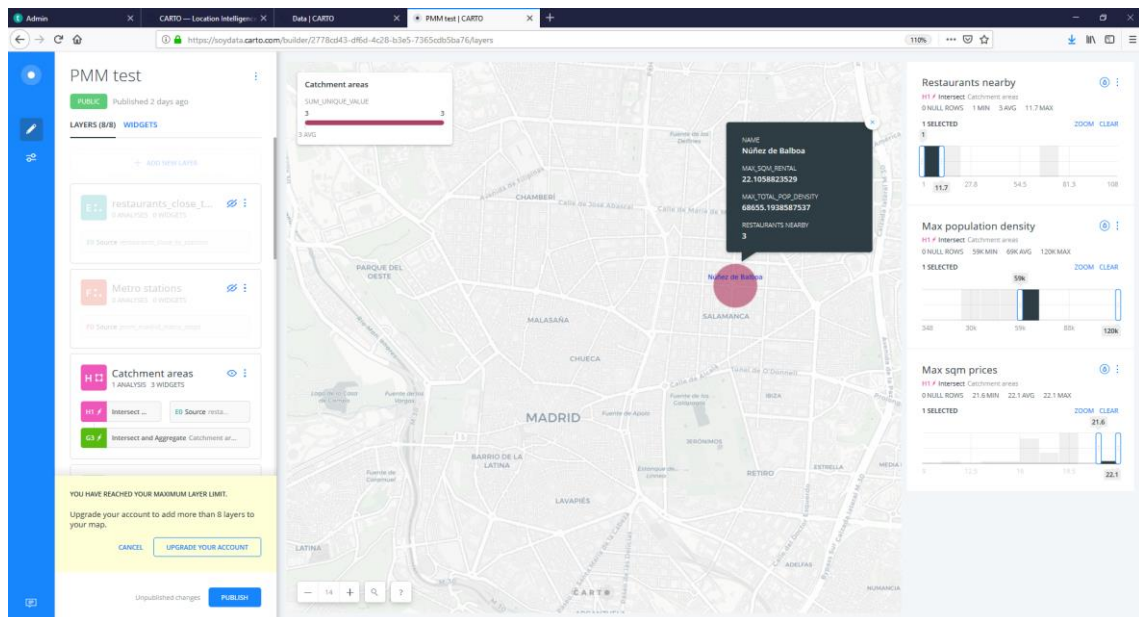




Notice that the number of potential zones decrease as we add selection criteria. Finally, with values of less than 12 restaurants nearby, population density between 59k and 120k and max sqm rental from 18.8 to 22.1 we have twelve candidate zones, labeled in the dashboard below:



Now we sharpen our threshold in real estate to select a winner, and the surroundings of Núñez de Balboa metro station, located in Salamanca district turns out to be the right place to start the new restaurant business in Madrid.



As you can see, with few competitors nearby (only three restaurants), being close to a metro station in a centric, populated and luxury zone of Madrid Núñez de Balboa shows optimal conditions.

<https://soydata.carto.com/builder/2778cd43-df6d-4c28-b3e5-7365cdb5ba76/embed>

```
<iframe width="100%" height="520" frameborder="0"
src="https://soydata.carto.com/builder/2778cd43-df6d-4c28-b3e5-7365cdb5ba76/embed"
allowfullscreen webkitallowfullscreen mozallowfullscreen oallowfullscreen
msallowfullscreen></iframe>
```

(iframe code to show final dashboard in the blog post)

Acknowledging the cook

When we asked Almudena how you can choose the right tool in this kind of analysis she answered, rather inspired:

“We always visualize results, but processes underneath is hard to be seen. Is not only a viewer, there’s a strong difference having geoprocessing and dashboard tools in a cloud-based service like CARTO Builder.”

After that successful meeting I wonder, as I remember Almudena’s self-assurance and classy style...can we even map love?

-If you enjoyed the above fictional business case about how to use CARTO Builder and want to go deeper on MCDA you can gather more information [here](#)