

# Mastering Big Data Visualization & Storytelling Workshop I: Analyzing real estate listings in Madrid

Madrid's real estate market showcases a dynamic array of properties, reflecting the city's diverse neighborhoods and economic shifts. These listings, enriched with geographic and property-specific data, provide a comprehensive view of the housing market. In this workshop, we will explore the **idealista18** dataset, which contains over **90,000 real estate listings** from the city of Madrid in 2018. The dataset includes valuable information like property prices, indoor characteristics (e.g., size, number of rooms), and geographical features such as proximity to urban points of interest.

In this tutorial, we will focus on visualizing and analyzing this data to gain insights into the real estate market in Madrid. Specifically, we'll visualize how property prices vary across different neighborhoods and how key factors such as proximity to the city center, property size, and building quality impact listing prices. You can access the map [here](#).

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## Your CARTO account

For this session, you'll need a CARTO account!

If you don't have one, you can set up a free 14-day trial at [app.carto.com](https://app.carto.com). This should only take a couple of minutes to do, but we do recommend setting this up before coming to the workshops so you can dive right in!

**!** There is a maximum of one CARTO account per email address. If you have previously set up a free trial with your email, we recommend using an alternative email address for this session. If you run into any issues setting up an account, please contact [support@carto.com](mailto:support@carto.com).

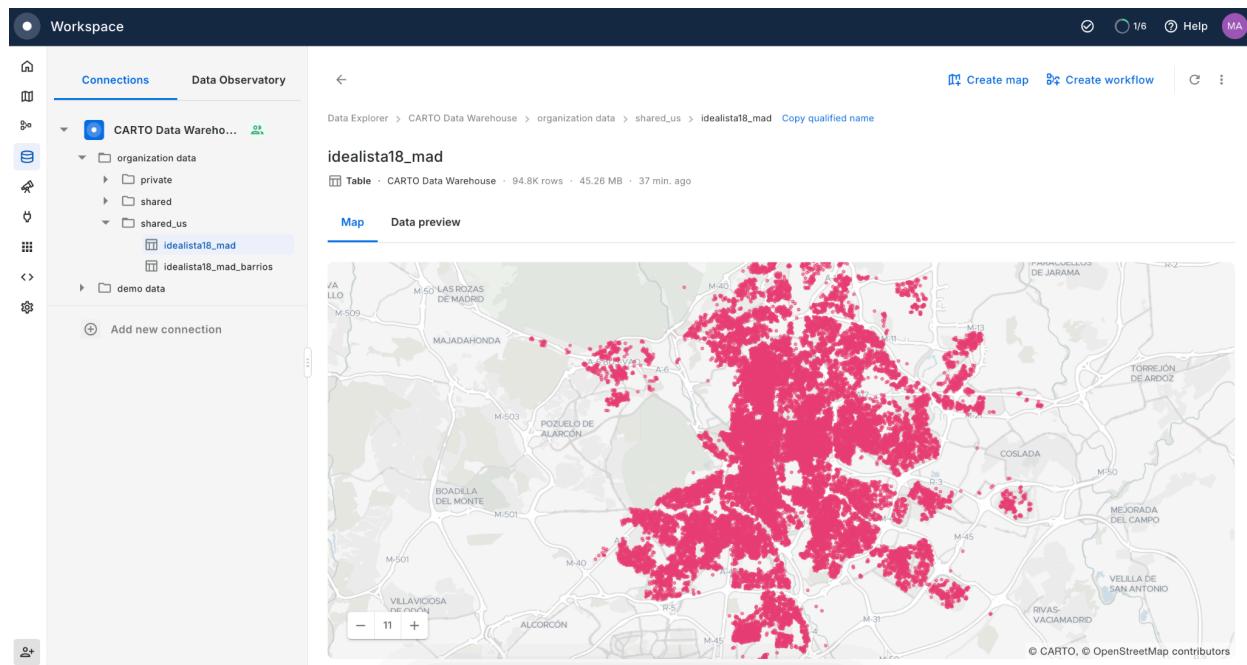
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# Let's visualize some data!

## Let's find our data

In this workshop, we'll be using a table that contains information about real estate assets in Madrid. These [data](#) were originally published on the idealista.com real estate website in 2018. We have processed it and uploaded it to our CARTO account so that it is easily accessible.

1. In the [CARTO workspace](#), head to the **Data Explorer > CARTO Data Warehouse organization data > shared\_us > idealista18\_mad**
2. Take a look at the **Map** and the **Data preview** sections to see which information is available
3. Click on **Create map**. This will load your data into a new **CARTO Builder** map so that you can customize it!



# Styling your maps

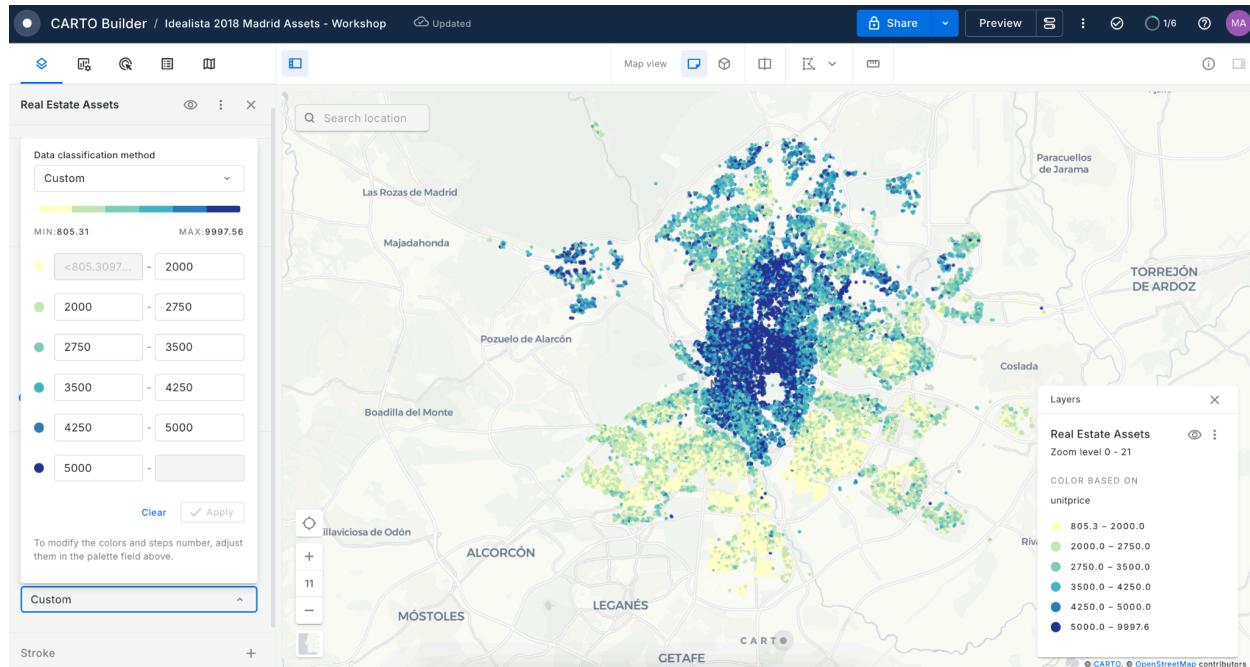
Let's improve this map a little:

1. **Rename the map** to "Idealista 2018 Madrid Assets" at the top-left of the screen
2. **Rename the layer** to "Real Estate Assets" by clicking the 3 dots next to **Layer 1**

## Layers

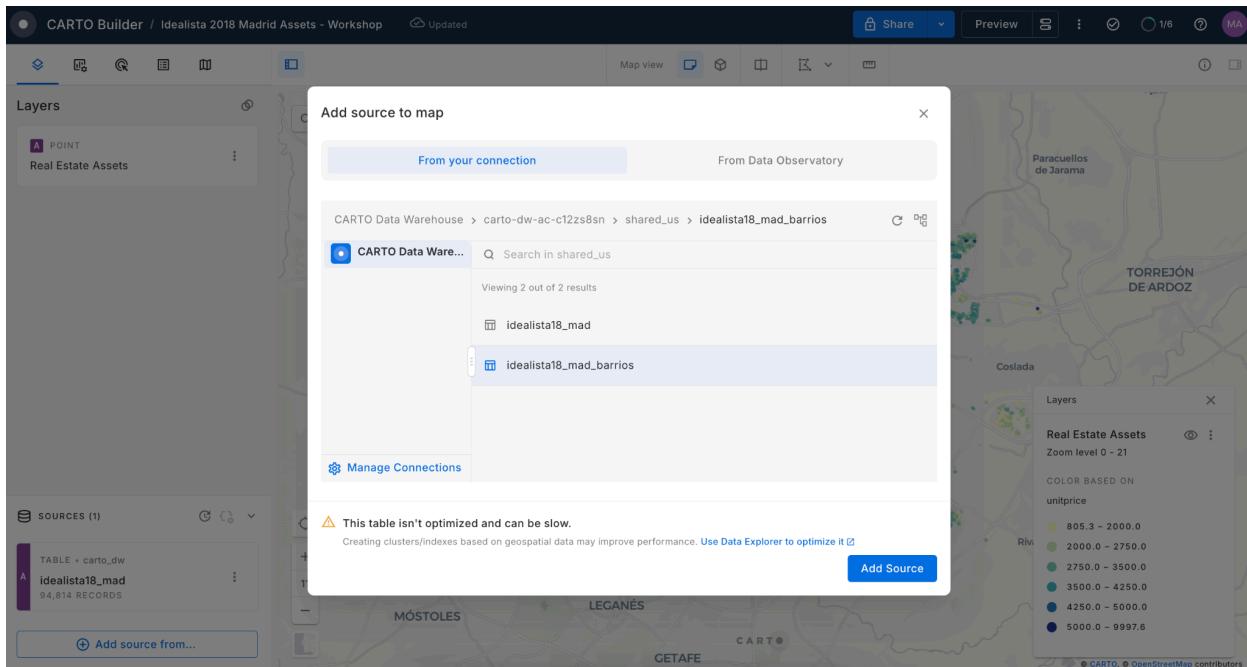
**Style the layer** by clicking on the layer name - you can change the fill, stroke, radius and more!

1. We will **Fill** in the dots by **unitprice** and customize the palette a bit (both the color and the buckets).
2. You can play with the colors and the opacity to make your map look nicer.



You can easily add more layers to make your map more interesting! Let's load some aggregated data at the Neighborhood Level that shows the average asset unit price for each neighbour in Madrid. To do so:

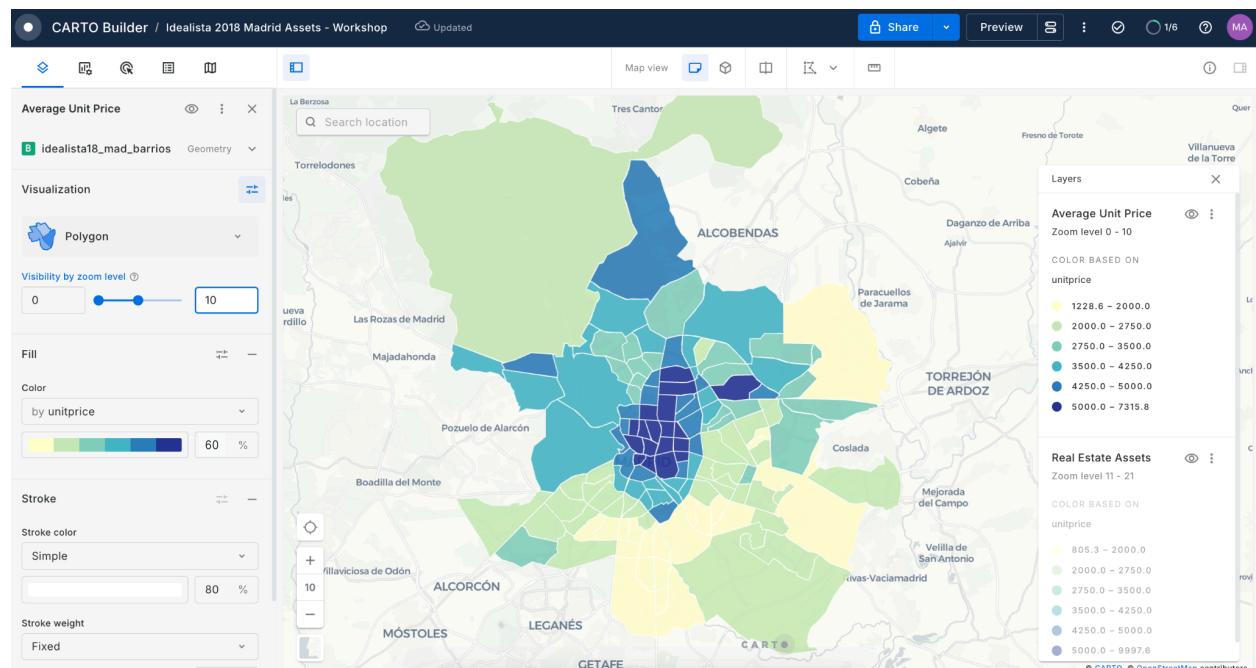
1. Click on **Add source from...** > **Data Explorer** > **organization data** > **shared\_us** > **idealista18\_mad\_barrios** below the sources section
2. Then click on **Add Source** and style your new layer!



To make this a bit fancier, let's adjust the **Visibility by zoom level** of each layer. What we want is to see average prices for each neighborhood at low zoom levels, and observe the actual asset unit prices once we zoom in in the map:

1. Go to the neighbours layer and change the visibility from 0 to 10
2. Go to the assets layer and change the visibility from 11 to 21

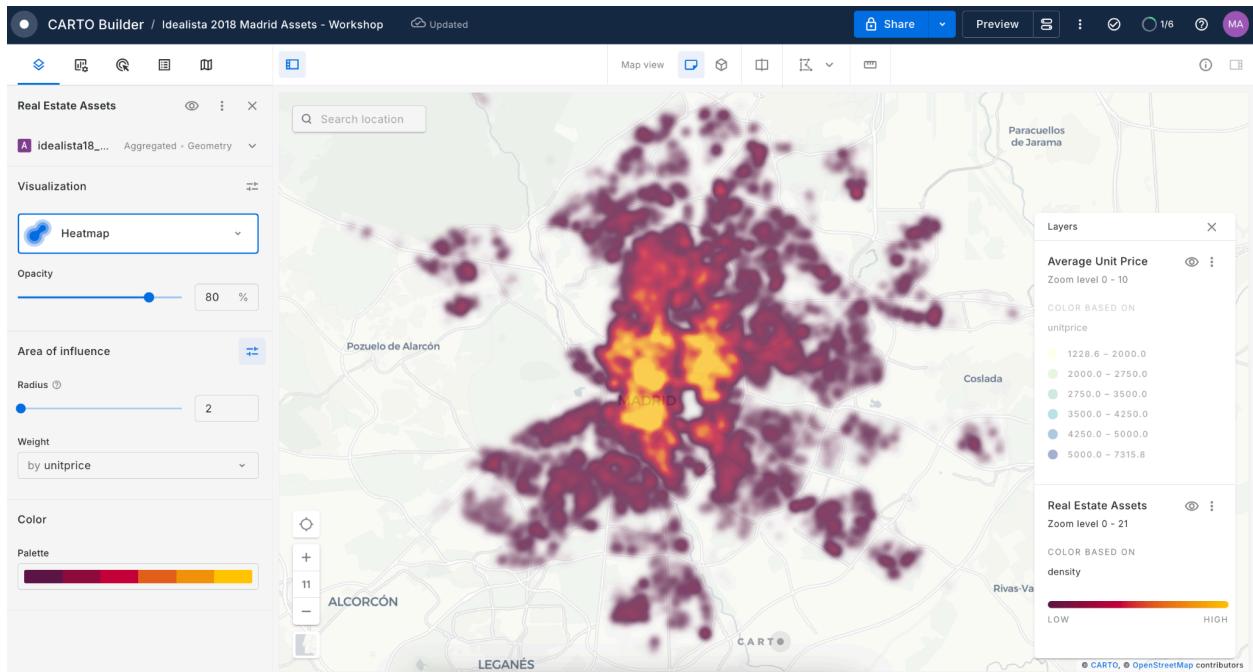
Now, navigate through the map and see how it behaves.



**#ProTip:** In some cases, you may want to change the visualization type of your layer. For instance, you may want to aggregate some point data into Spatial indexes or visualize a heatmap to look for hotspots! See how cool this looks if we:

1. Go to the assets layer and select **Heatmap** as the visualization method
2. **Weight** the points by unit price

You can try different methods to see how this affects the visualization.

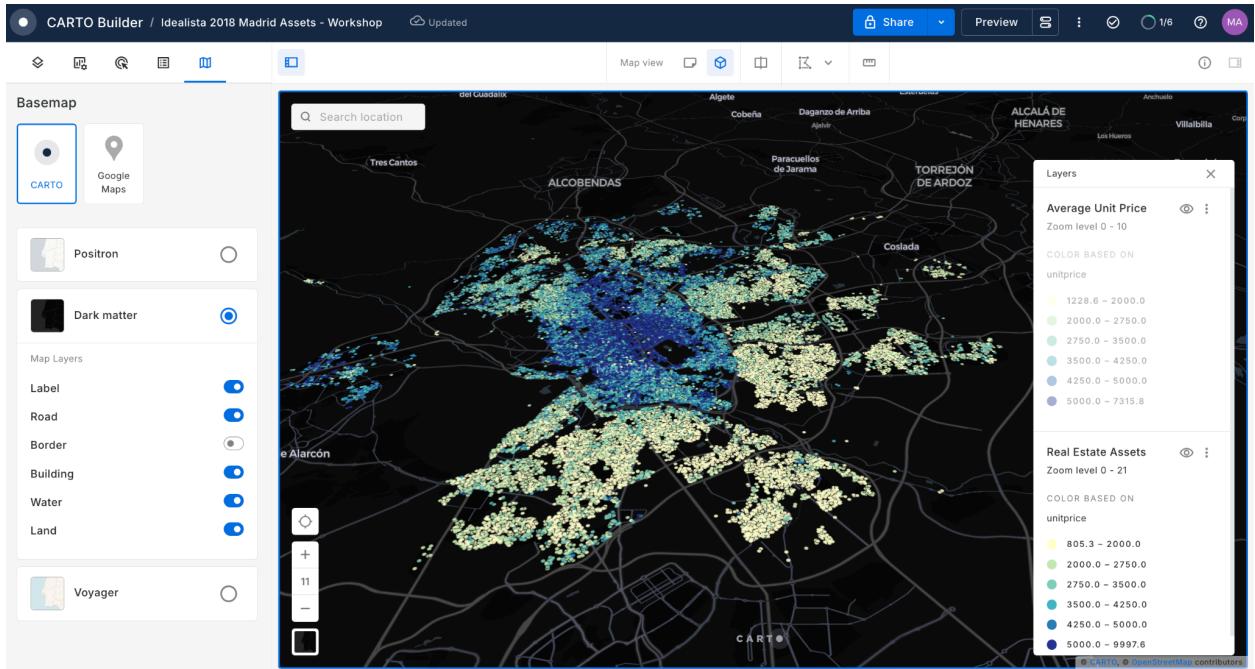


## Basemaps & Map view

Let's now explore more styling options:

1. Go to the Basemap section of the left-side menu and select the **Dark matter** basemap
2. You can play with the different options to customize the visualization depending on whether you want -or not- to see some details: country labels, roads, water bodies...

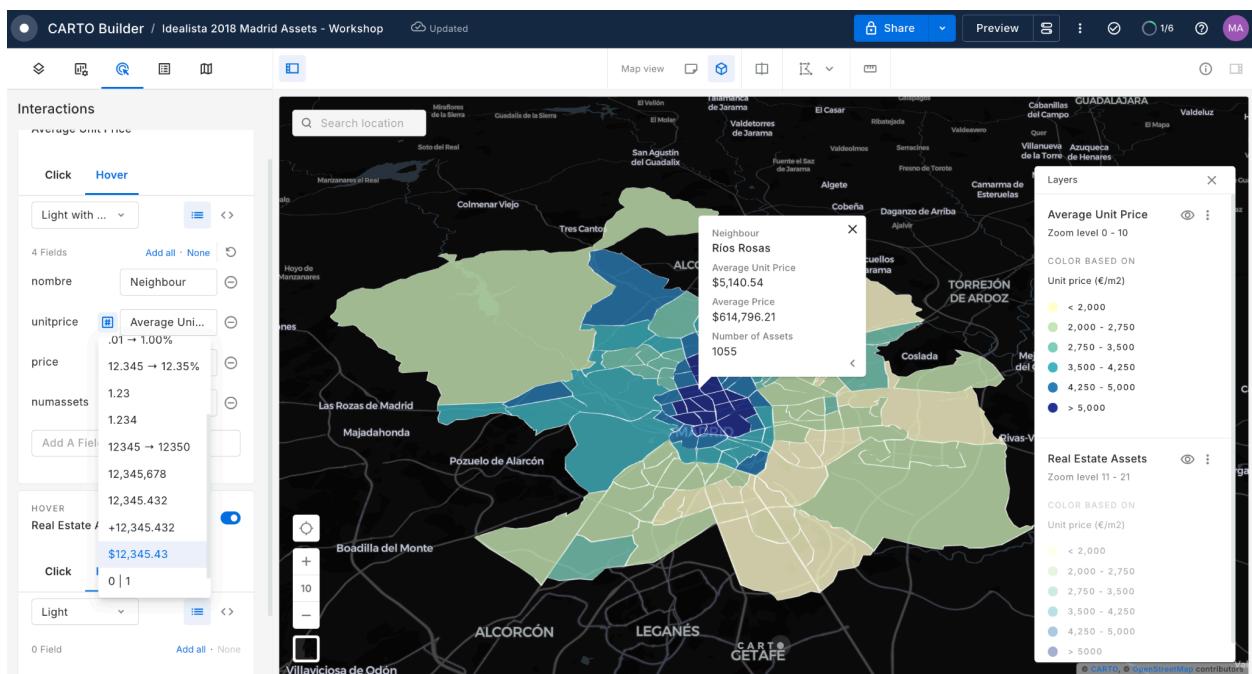
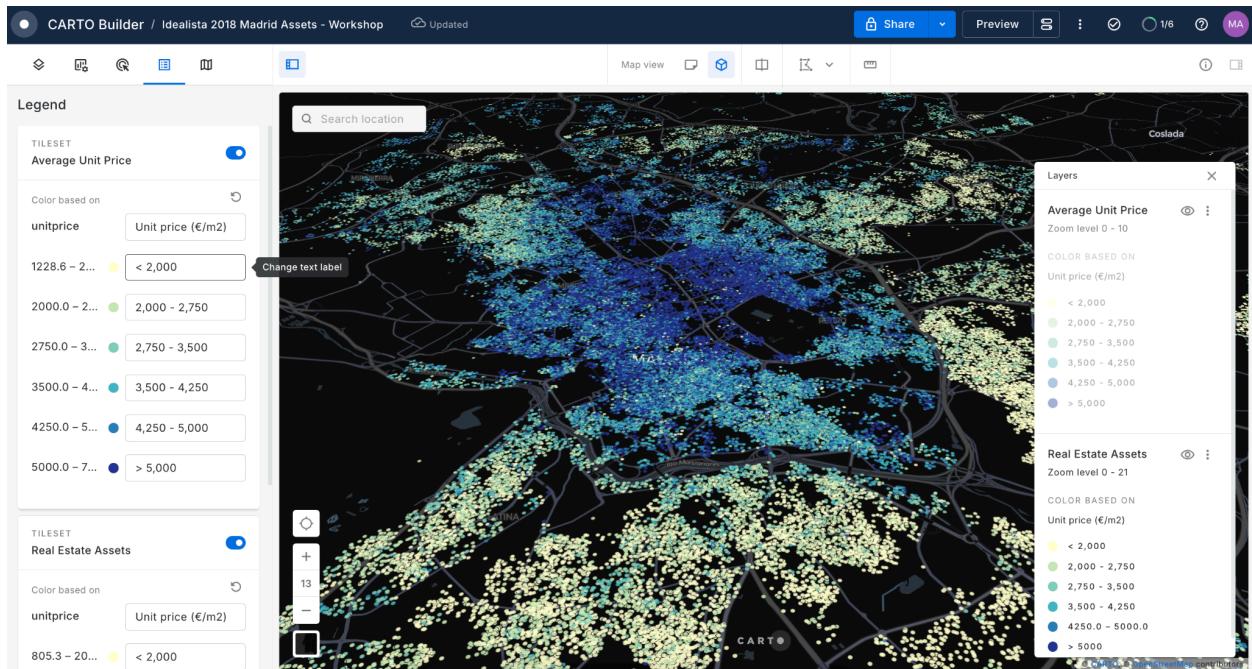
**#ProTip:** Just above the map, you can see some icons. These allow you to create two windows in case you want to compare two different layers simultaneously, or even change the visualizations from 2D to 3D! You can change the angle of the 3D visualization by pressing Shift + click & move the mouse on the screen.



## Legend & Interactions

What is a map without a legend? Let's style the legend and add some tooltips to make our map much more informative.

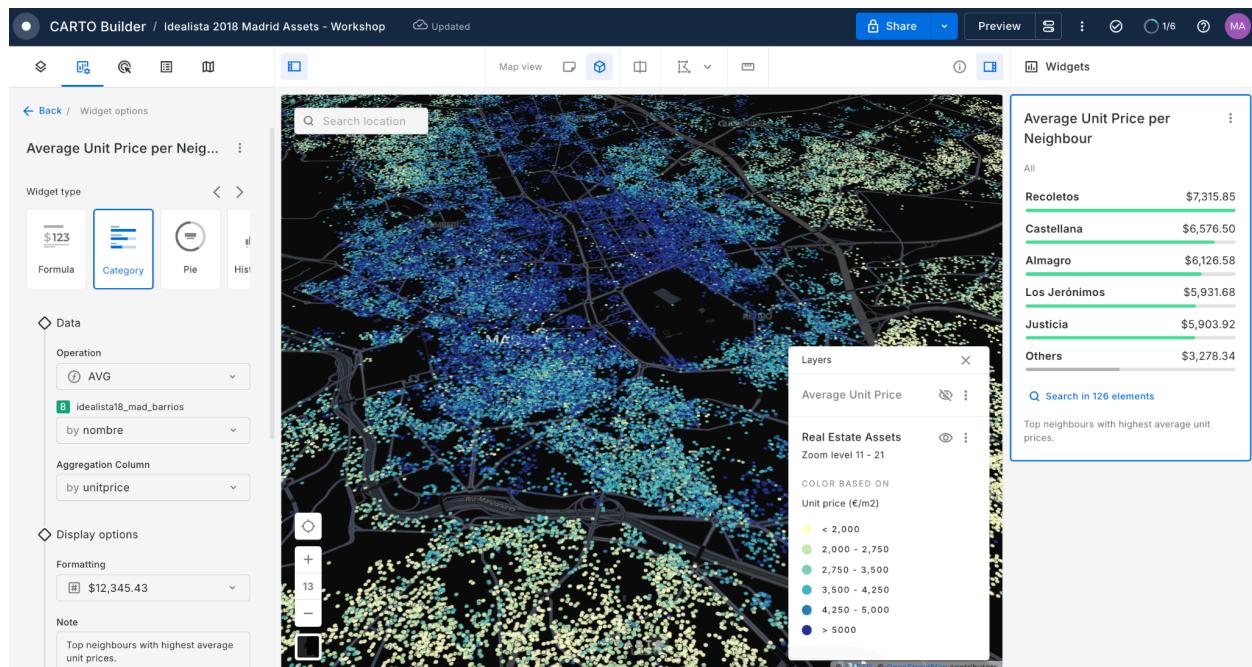
1. Go to the **Legend** menu and include the units of the variable we are representing: "Unit price (€/m<sup>2</sup>)". You can also change the text within each label to make it more readable
2. Go to the **Interactions** menu and set up the tooltips for each layer. Click on **Hover > Light with highlighted 1st value** and add the variables you want to include. Do not forget to change their format to be more legible



# Widgets

Our map looks pretty good now! It is time to introduce Widgets, which will help us analyze our data in more detail, as they provide advanced functionality for exploring and filtering the information in our layers.

1. Go to the **Widgets** section and click on **New widget** and select the source of the data you want to apply filters to. Lets start with the neighbours data
2. Rename your widget to “Average Unit Price per Neighbour” by clicking on the three dots nearby Widget 1, then select **Rename**
3. We want to let the user see the top neighbours with higher average unit price. Select the **Category** widget, **Operation AVG**, **Field nombre** & **Aggregation Column** `unitprice`. Then, format the data and add any notes that may help the user understand the purpose of the widget if needed



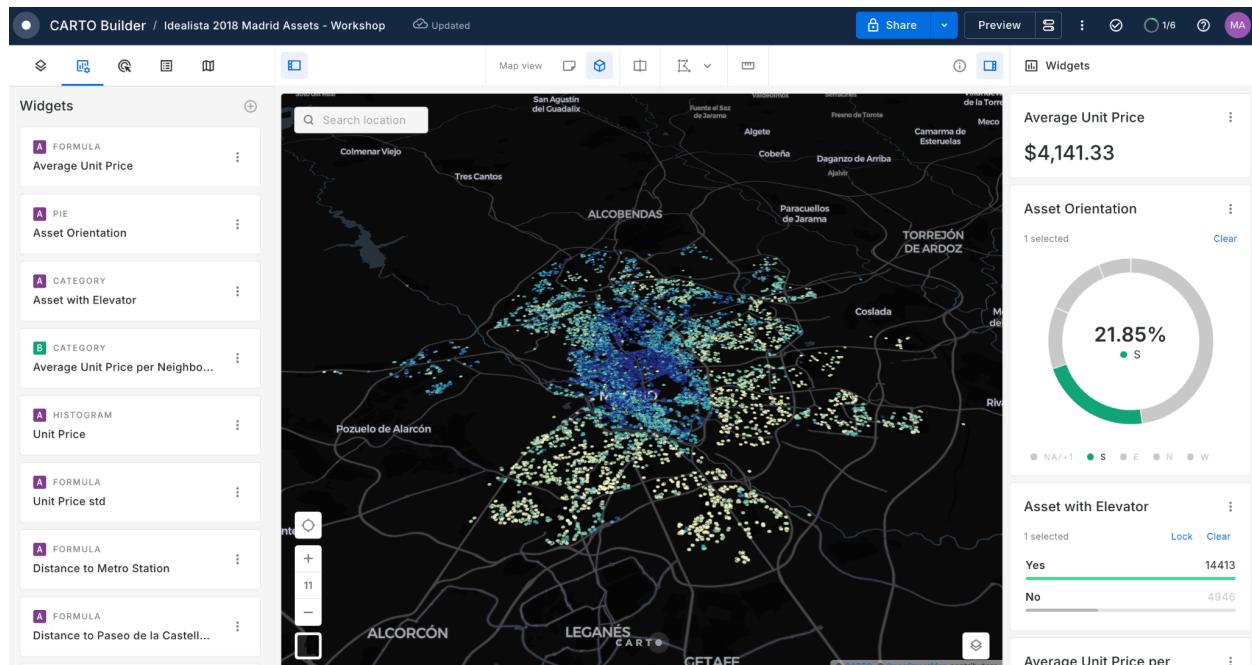
To add more widgets, go back to the **Widget** section, click on the **+** sign and select the assets source. Let's add widgets to filter and analyze the assets data. Here are some ideas:

1. Get the “Average Unit Price” and the “Unit Price Standard Deviation” using the **Formula** widget. Notice that you can create custom formulas by selecting the **Custom aggregation** option (i.e. `STDDEV_SAMP(unitprice)`)
2. Visualize the “Unit Price”, “Asset Size” & “Number of rooms” distributions using the **Histogram** widget
3. Analyze the “Asset Orientation” through a **Pie** widget
4. Filter the map to see which assets have terraces, elevators or A/C using the **Category** widget
5. Measure the correlation between the unit price and the distance to the closest metro station and to the Paseo de la Castellana (i.e. `CORR(distance_to_metro, unitprice)`) using the **Formula** widget

Notice that you can enable the **Filter by viewport** option if you want the widgets to dynamically change as you navigate the map.

Once you have your widgets ready, you can filter your map and analyse what you see! Here are some examples:

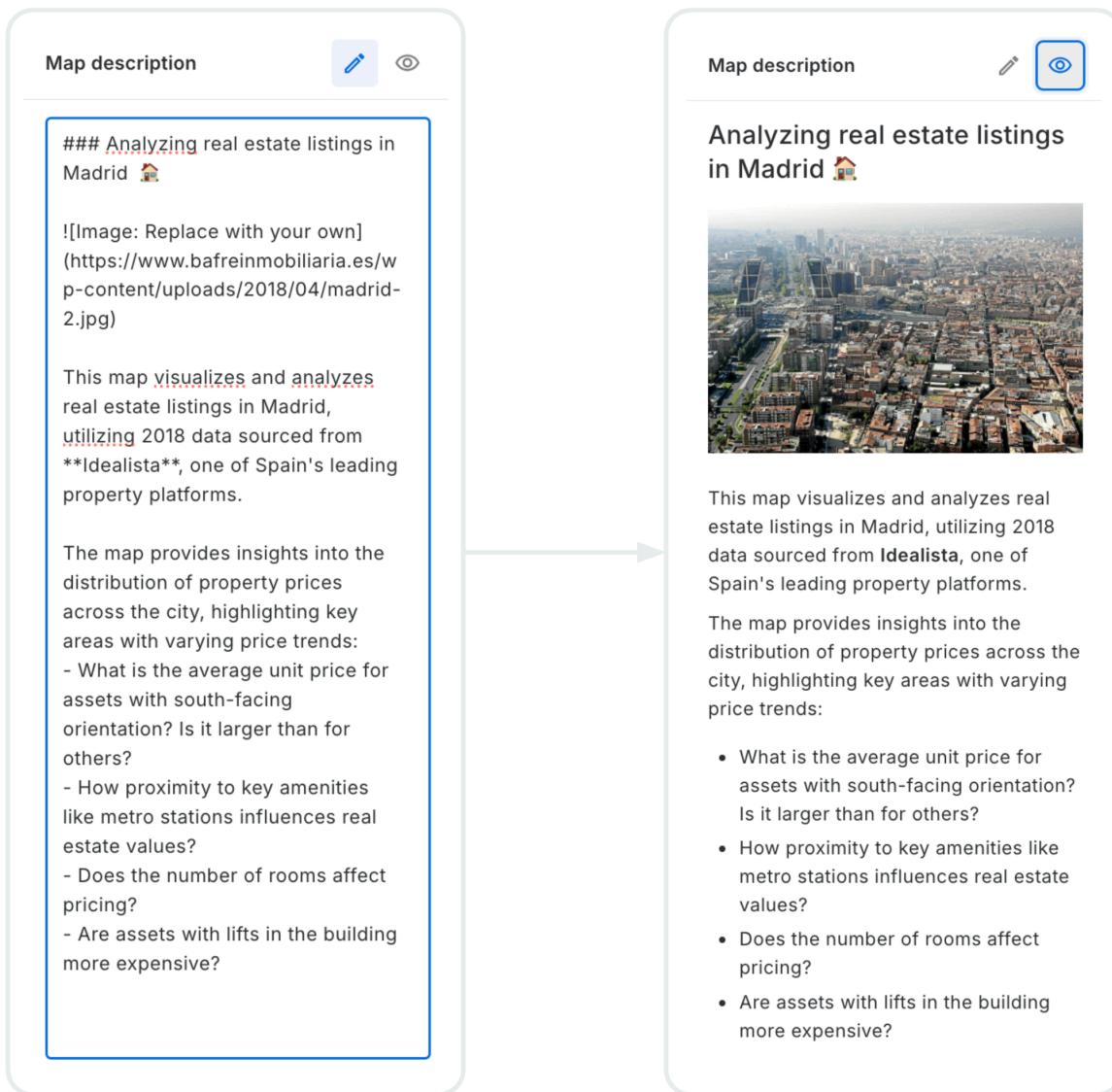
- What is the average unit price for assets with south-facing orientation? Is it larger than for others?
- How proximity to key amenities like metro stations influences real estate values?
- Does the number of rooms affect pricing?
- Are assets with lifts in the building more expensive?



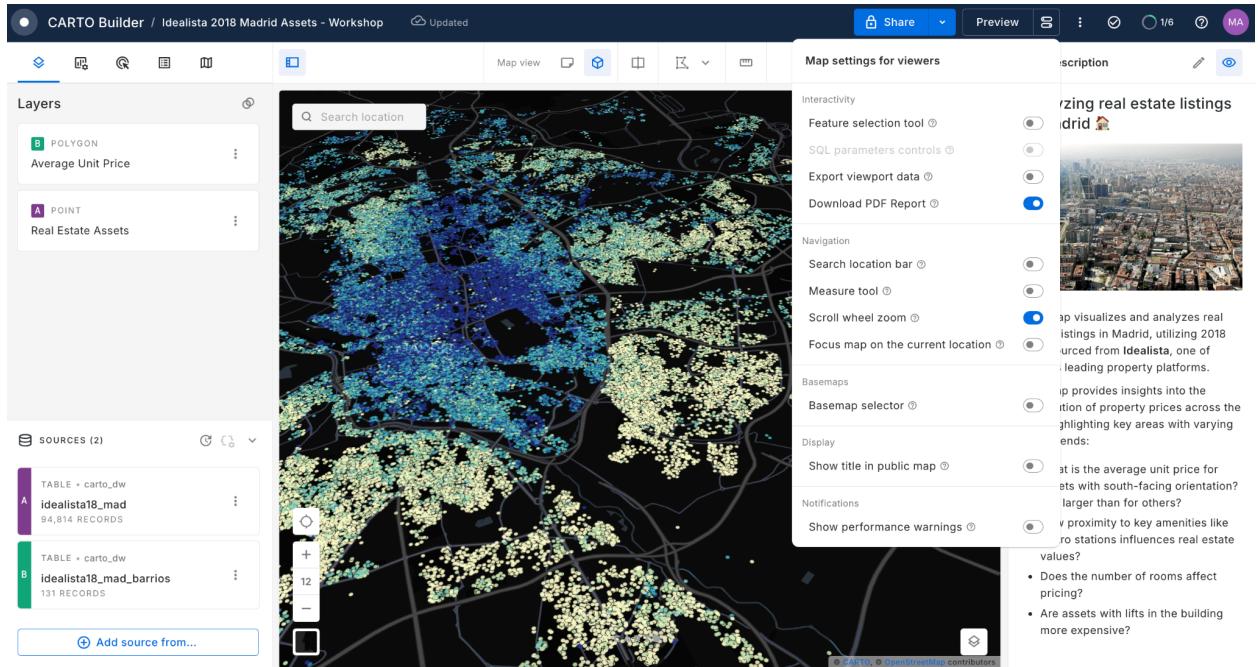
## Final touches

Our map is almost ready! There is one more thing we can do before sharing it with others. Let's add a description so that everyone can understand what this map is and what its purpose is!

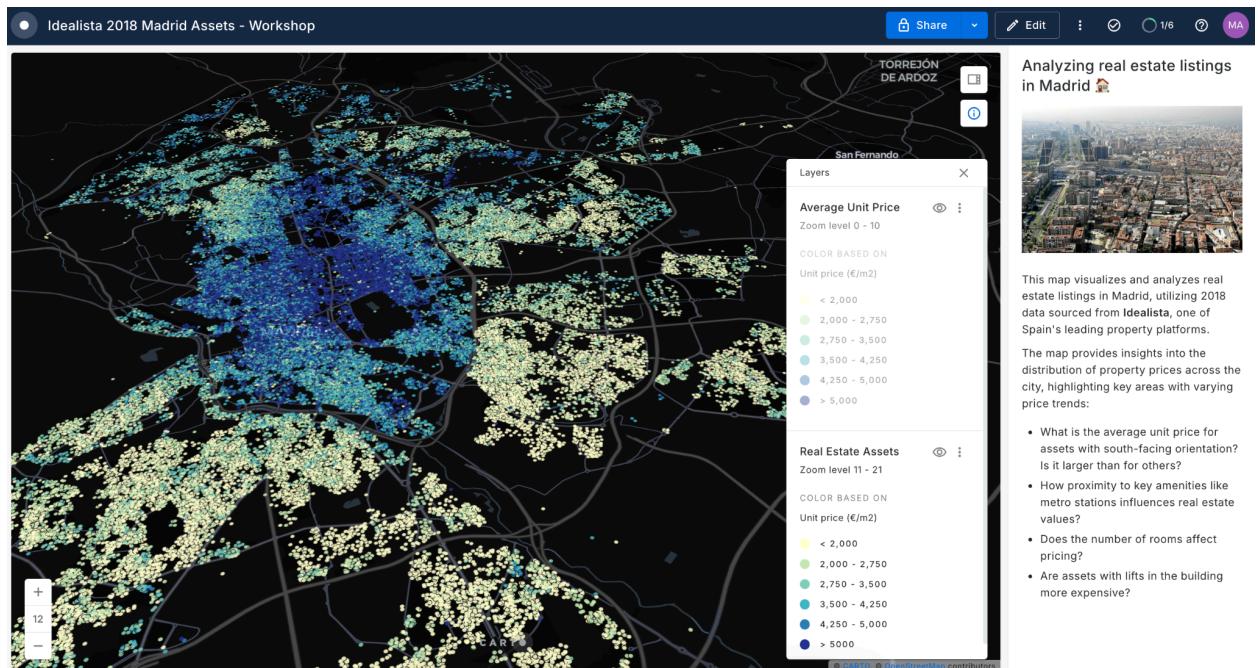
To do this, go to the ⓘ icon near the widgets, on the right-side of the map and insert your description using [markdown syntax](#). You can include images too



Now, near the **Preview** button, you can change the map settings for viewers, like allowing them to download the data in the map, download a PDF report, or change the basemap.



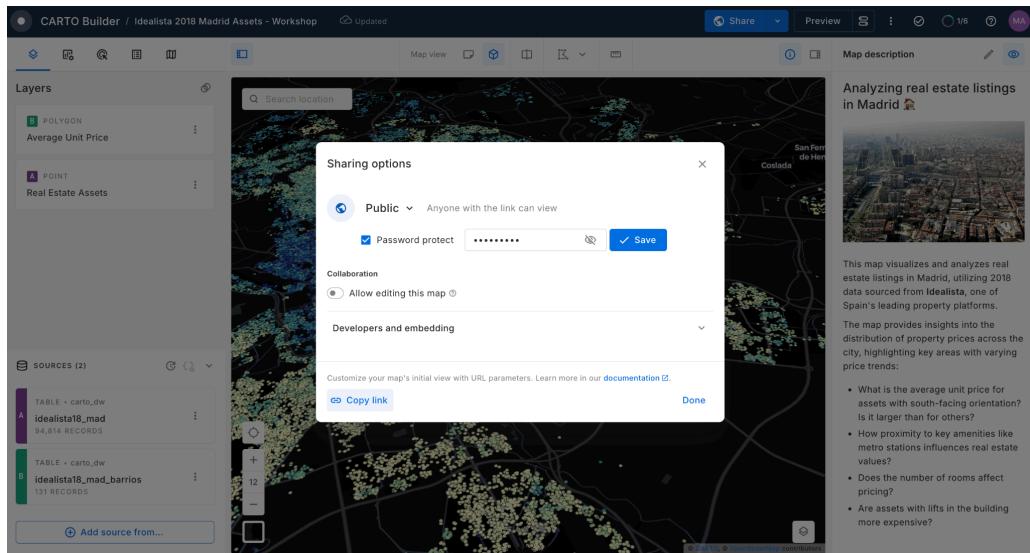
Then, click on **Preview** to see how your final map looks and make sure everything is nice and clean. Now, you are ready to share your first map!



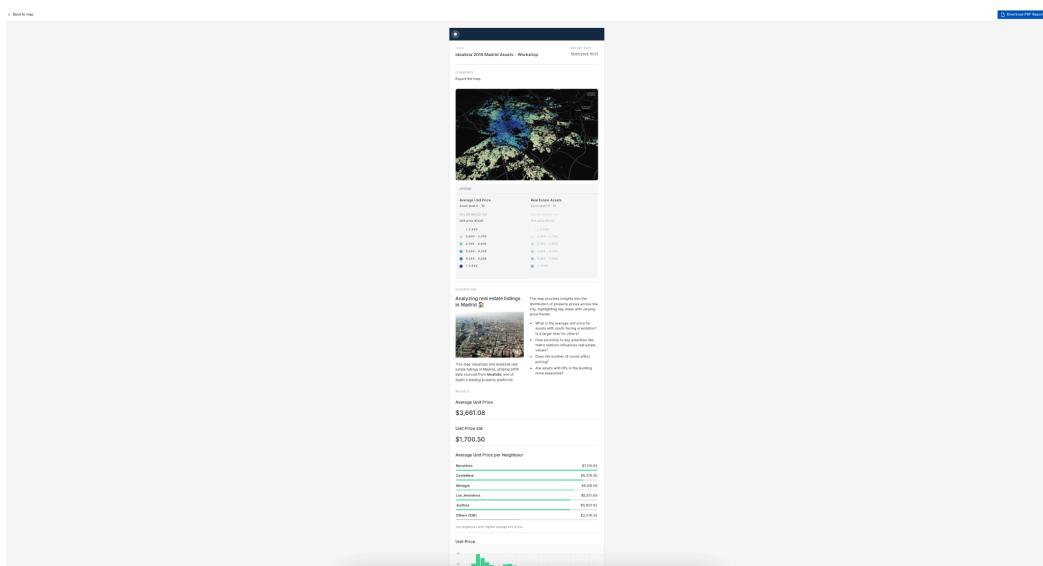
# Sharing & exporting your maps

Lastly, you can share your map with others in two ways:

1. To share the map's URL link, open the **Share** menu (top right of the window) and change your map to be publicly available. You can come back here to republish any future changes. Copy the link and share!



2. To share a quick report, make sure you have selected the **Download PDF Report** option in the map viewer settings. Then, click on **Preview** and look for the icon in the upper left corner of the map. Click on it, download your PDF and share!



Congratulations - **you've completed the workshop!**