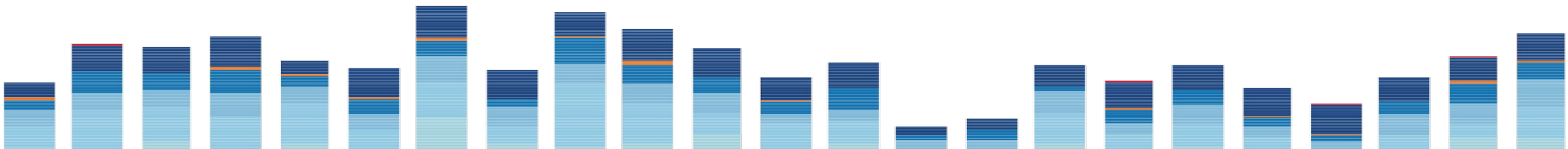


# CSE 91

## What Happened?

### Mapping



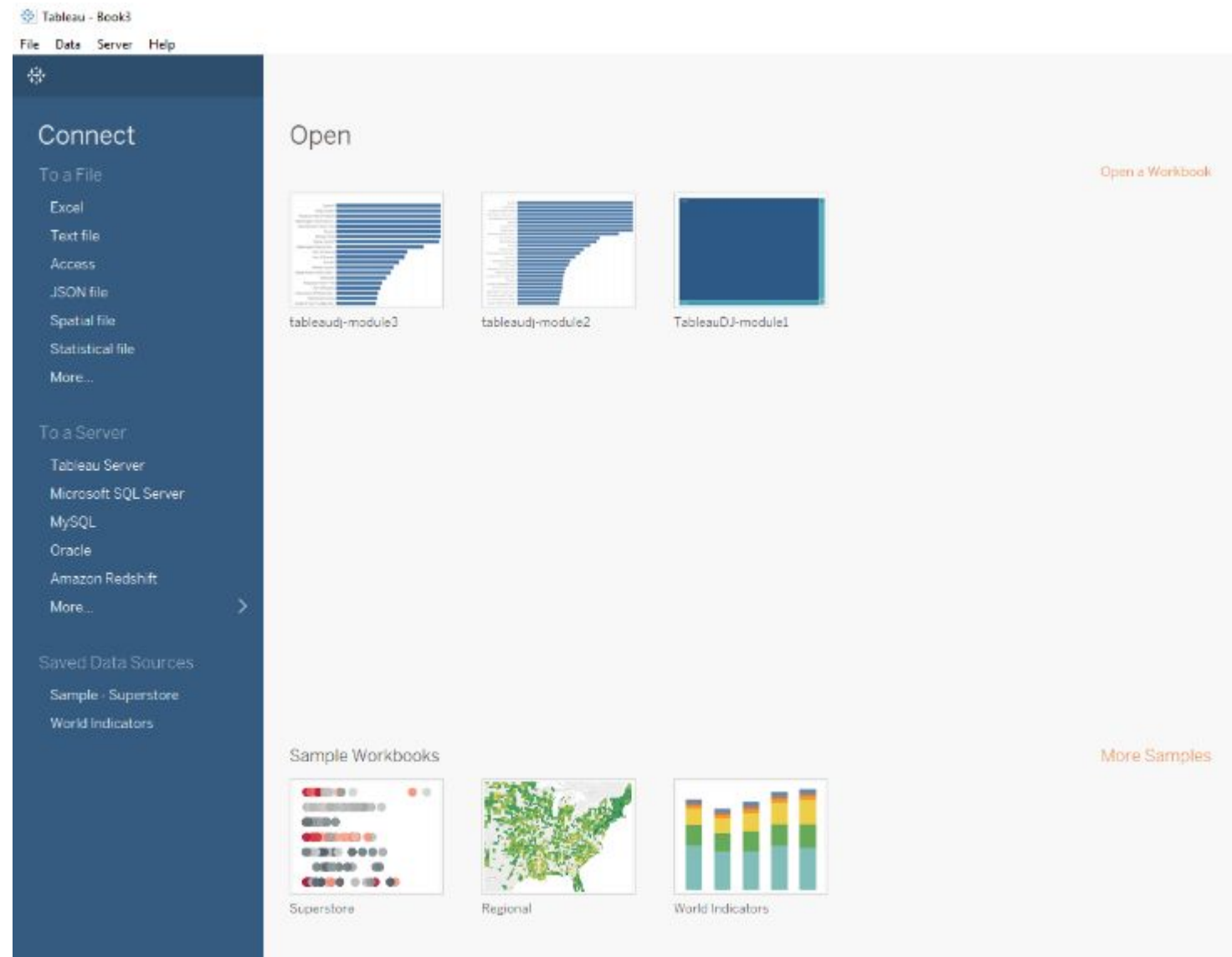
# Tableau basics

- More on Effective Chart Types
- Intro to effective mapping
- Using the Dashboard
- In-class exercise: design your own dashboard

# Mapping for understanding

In this module, we're going to go through an introduction to mapping and then explore how to visually explore data that has been mapped.

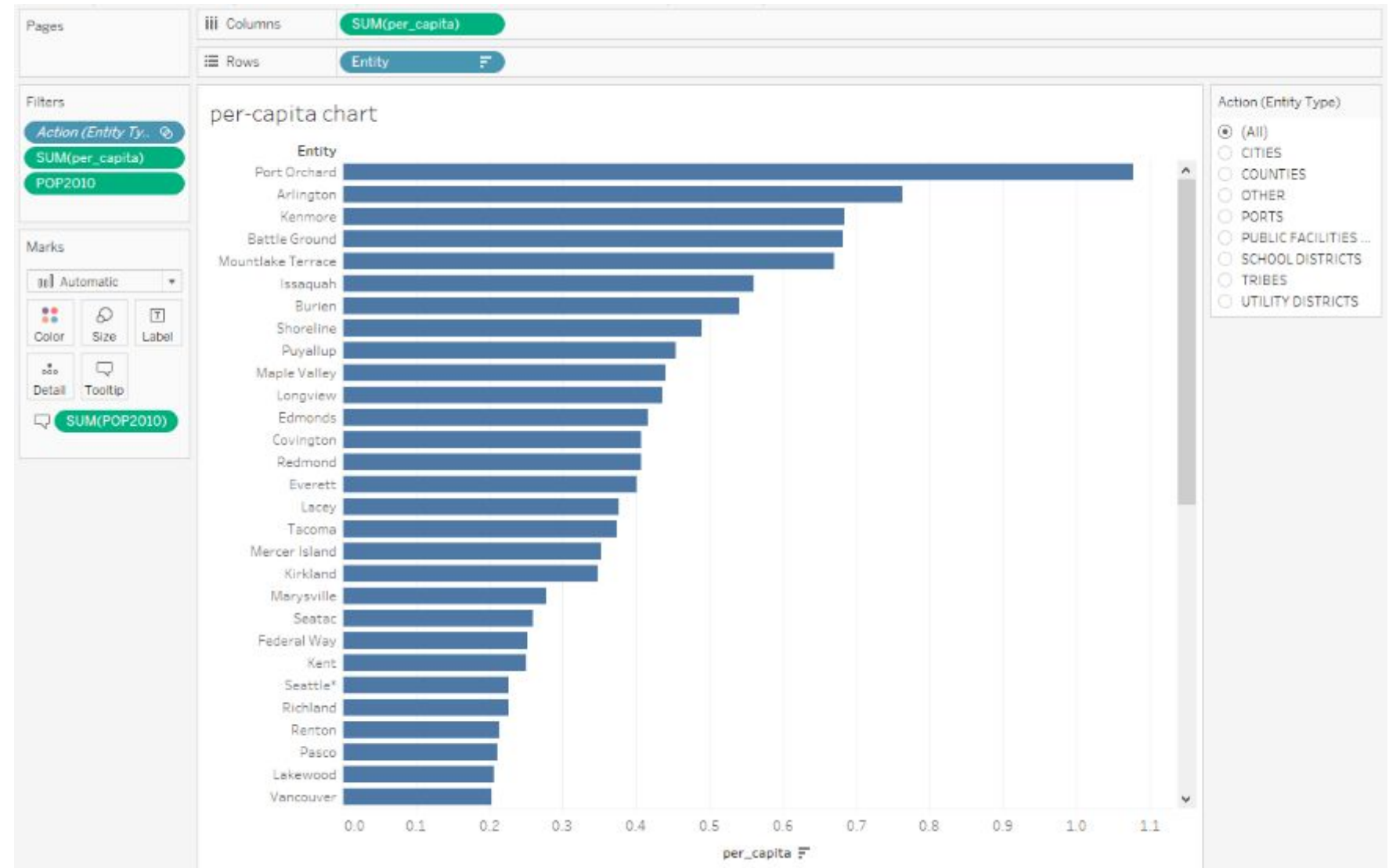
First, let's open our saved Tableau workbook from last time.



# Starting with maps

Last time, we built a bar chart with filters.

And in an earlier module, we also built a tree map with this data. Next, let's try to look at it geographically as well.



# Starting with maps

Tableau automatically will try to note which fields can be mapped.

You can tell these fields because they have a little globe next to them.

If you look at the dimensions and measures area in your workbook, you also will see at the bottom that Tableau generated a latitude and longitude based on the data that you imported. Under dimensions, several fields now have small globes next to them. Those are fields that Tableau considered geographic.

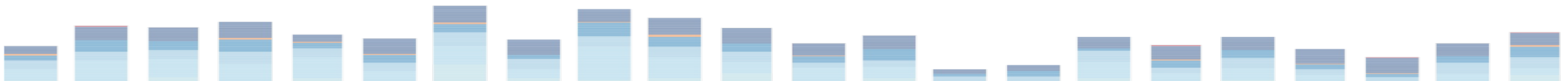


# Starting with maps

Take a closer look at the fields listed under Dimensions.

Are there any other fields that might be geographic – that we could map?

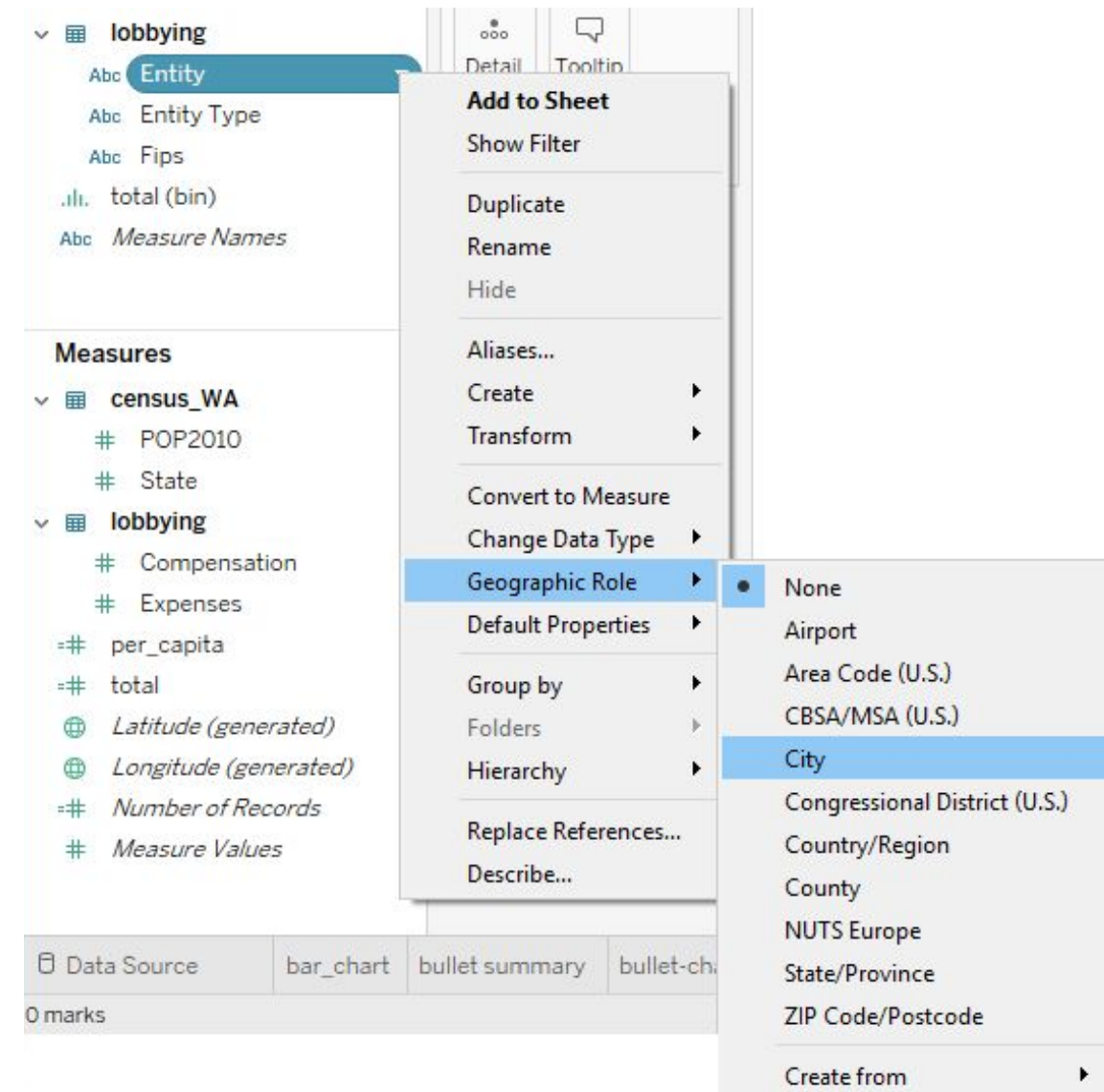
In the lobbying data – sheet 1 under dimensions, we could convert the entity field to a geographic role but we will inherit a few problems when we do that. Remember, it includes ports, tribes and associations and not all of those can be mapped. Still, it's useful to see how Tableau can deal with this problematic field that still has some geographies associated with it.





# Starting with maps

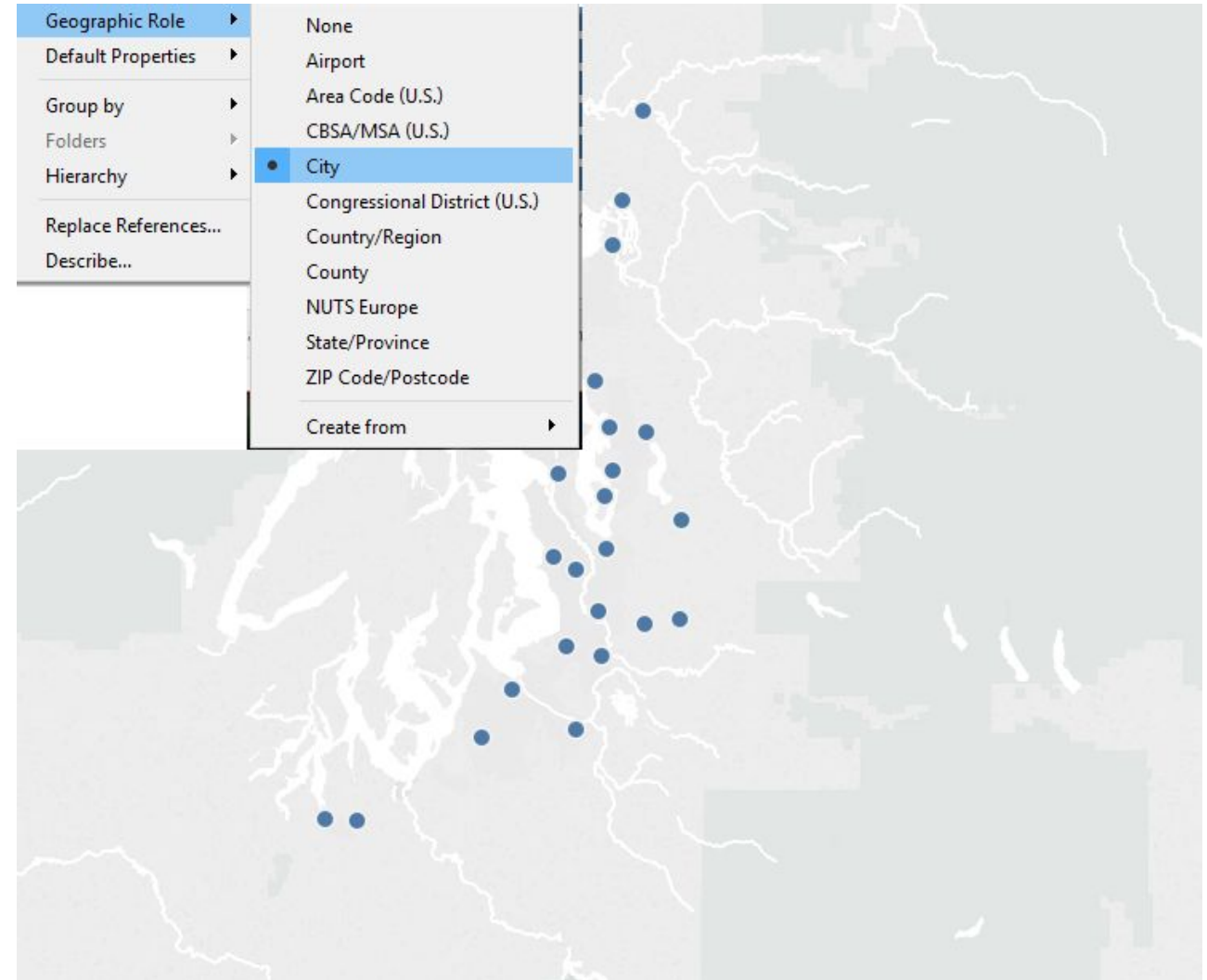
- Select the caret (down arrow) on the right of the pill for Entity.
- Go down to Geographic Role and then select City.



# Starting with maps

Now, you'll see that there is a little globe next to that field.

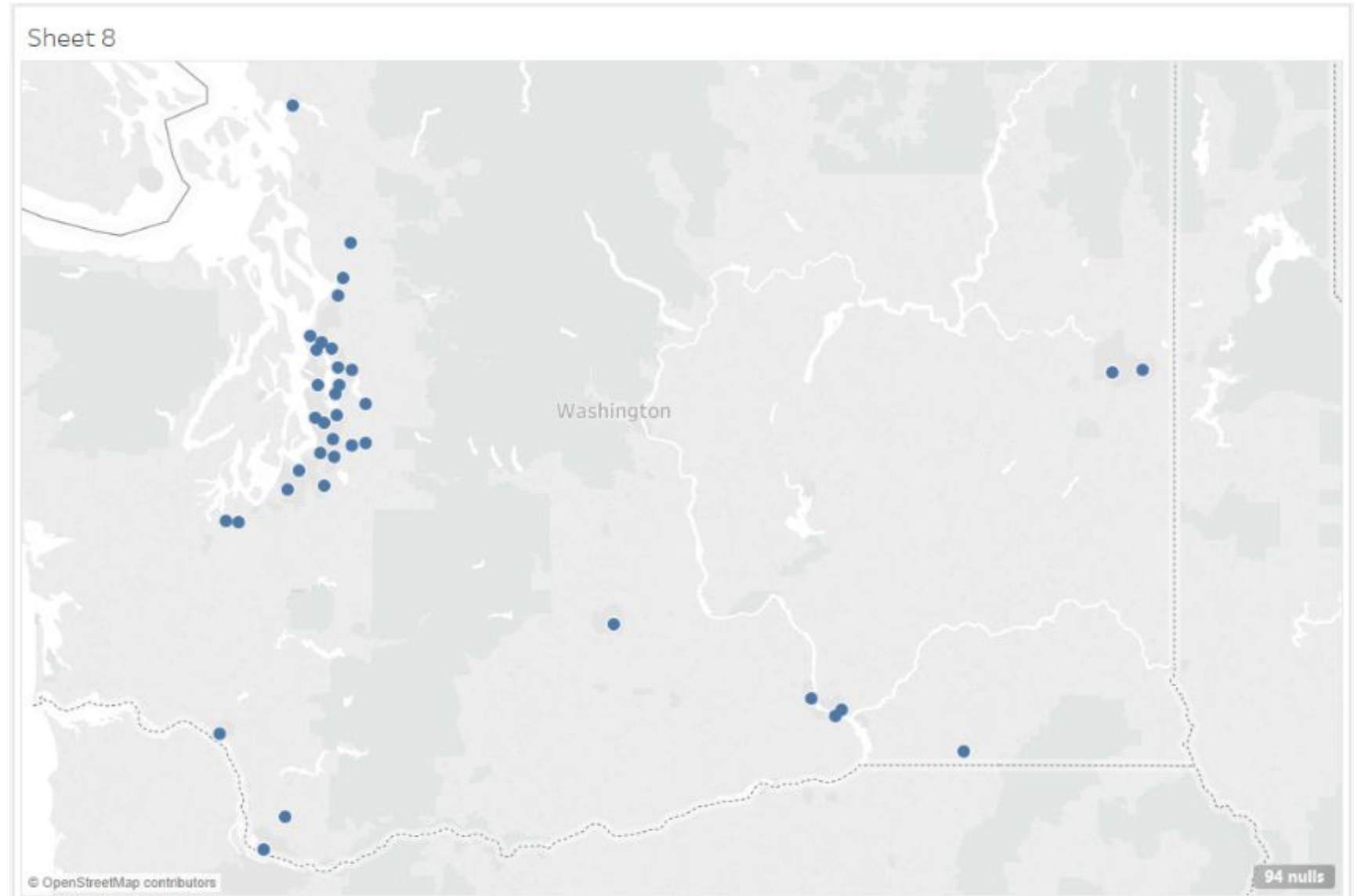
- Try double-clicking on **Entity** and let's see if we can build a map.





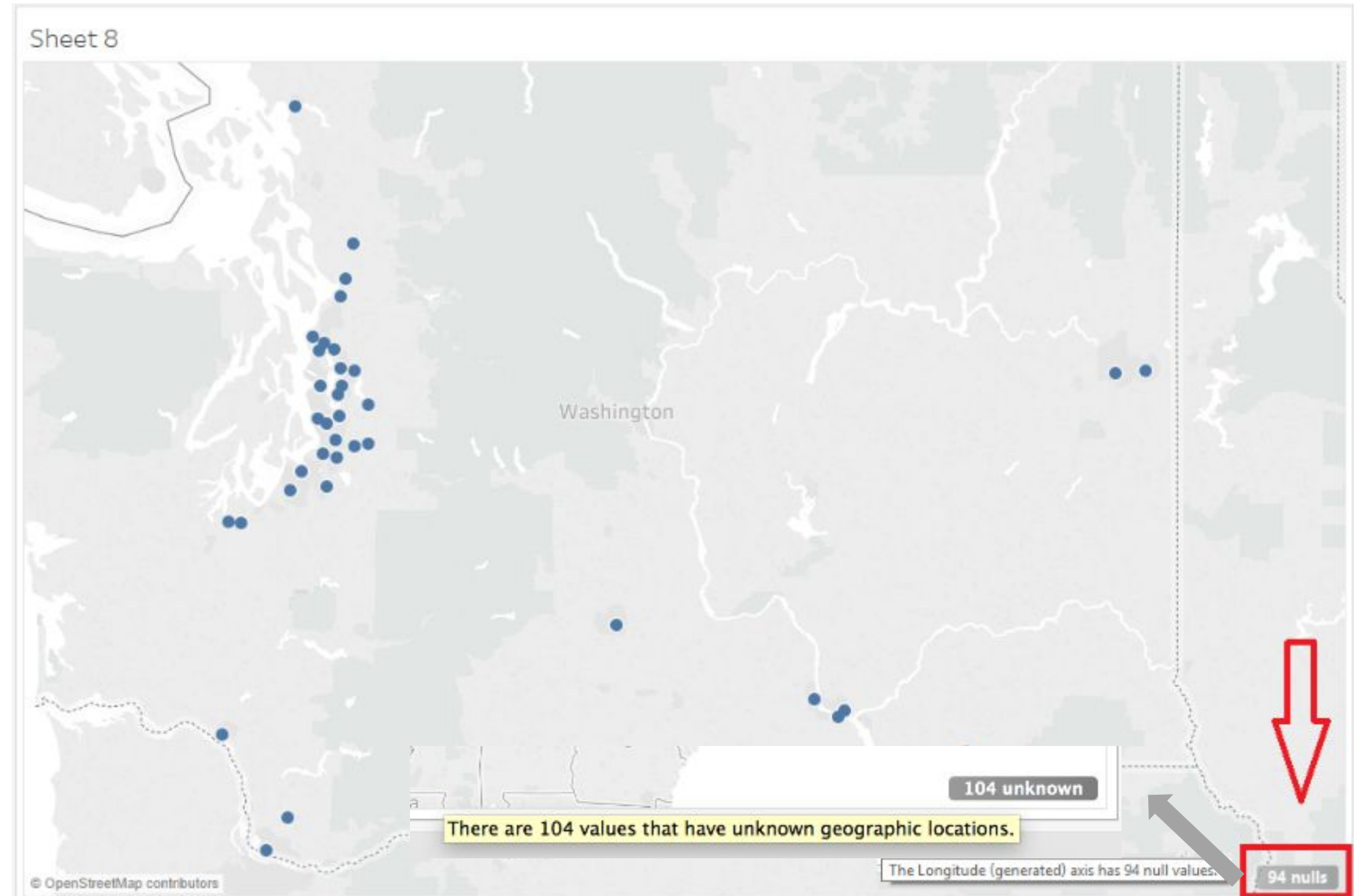
# Starting with maps

Anyone notice  
anything about this  
map that we should  
look at more closely?



# Starting with maps

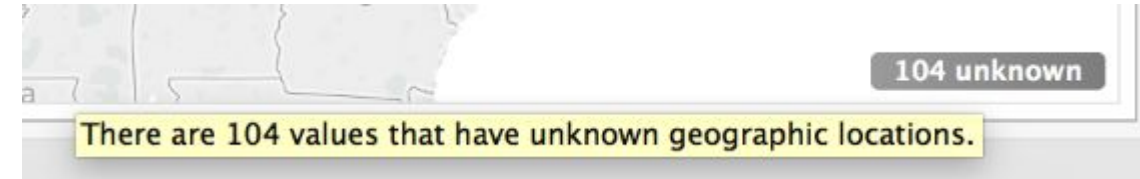
Anyone notice anything about this map that we should look at more closely?



# Starting with maps

- Click on that grey box that says **104 unknown**. A dialogue box will open.
- Select the **edit locations** option.

Tell me what you notice about the unrecognized locations.



The image shows a screenshot of a software window titled "Edit Locations". It contains several input fields and a table.

**Geographic roles**

- Country/Region: United States
- State/Province: Washington
- City: Entity-cleaned

**Match values to locations**

City

Your Data	Matching Location
Algona	Unrecognized
Asotin County	Unrecognized
Association Of Washington Cities	Unrecognized
Association Of Washington State Public ...	Unrecognized
Benton Public Utility District	Unrecognized
Central Puget Sound Regional Transit A...	Unrecognized
Chehalis Confederated Tribes	Unrecognized
Chelan Public Utility District	Unrecognized
Clark County	Unrecognized

☐ Show only unmatched locations in drop down list

Reset Matches Cancel OK

# Starting with maps

The ones that are unrecognized are either the fields that are not cities, or in some cases, they are smaller towns – and not included in Tableau’s designated cities. We can check that in a minute.

**Edit Locations**

Geographic roles

Country/Region: United States

State/Province: Washington

City: Entity ! 13 issues

Match values to locations

! City

Your Data	Matching Location
Algona	Unrecognized
College Place	Unrecognized
Fife	Unrecognized
Gig Harbor	Unrecognized
La Center	Unrecognized
Lake Stevens	Unrecognized
Omak	Unrecognized
Port Orchard	Unrecognized
Quincy	Unrecognized

☐ Show only unmatched locations in drop down list

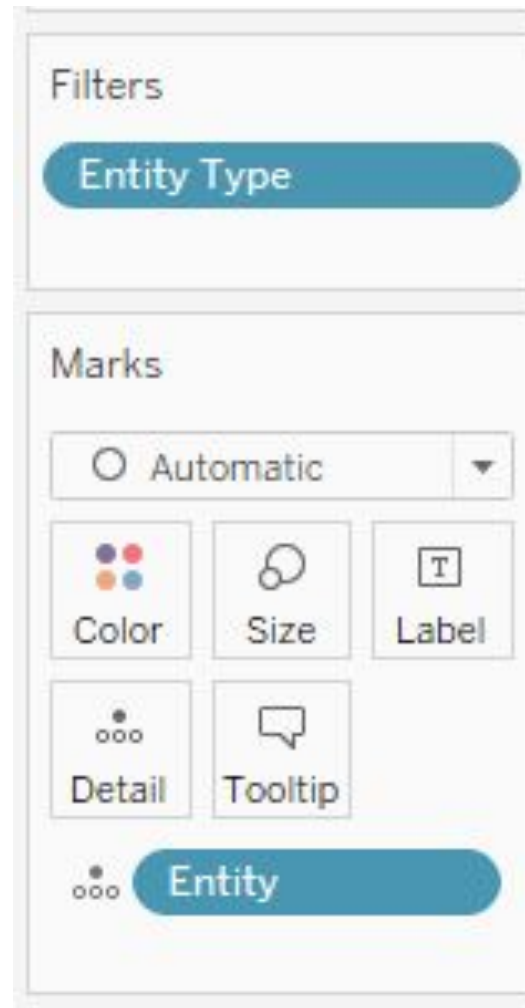
Reset Matches OK Cancel

# Maps and filtering

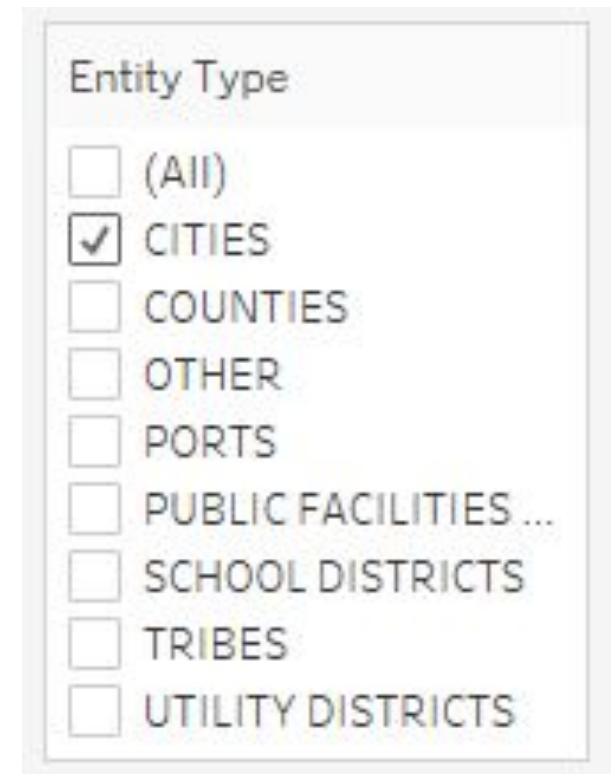
We have a few choices now. We can just choose to exclude all of the rows that Tableau doesn't recognize. But we don't want to make a mistake, so let's use filtering to understand a bit more of what Tableau is showing us.

1. Drag **entity\_type** onto filters.
2. Then select **Show Filter** and choose **Cities**.

1.



2.



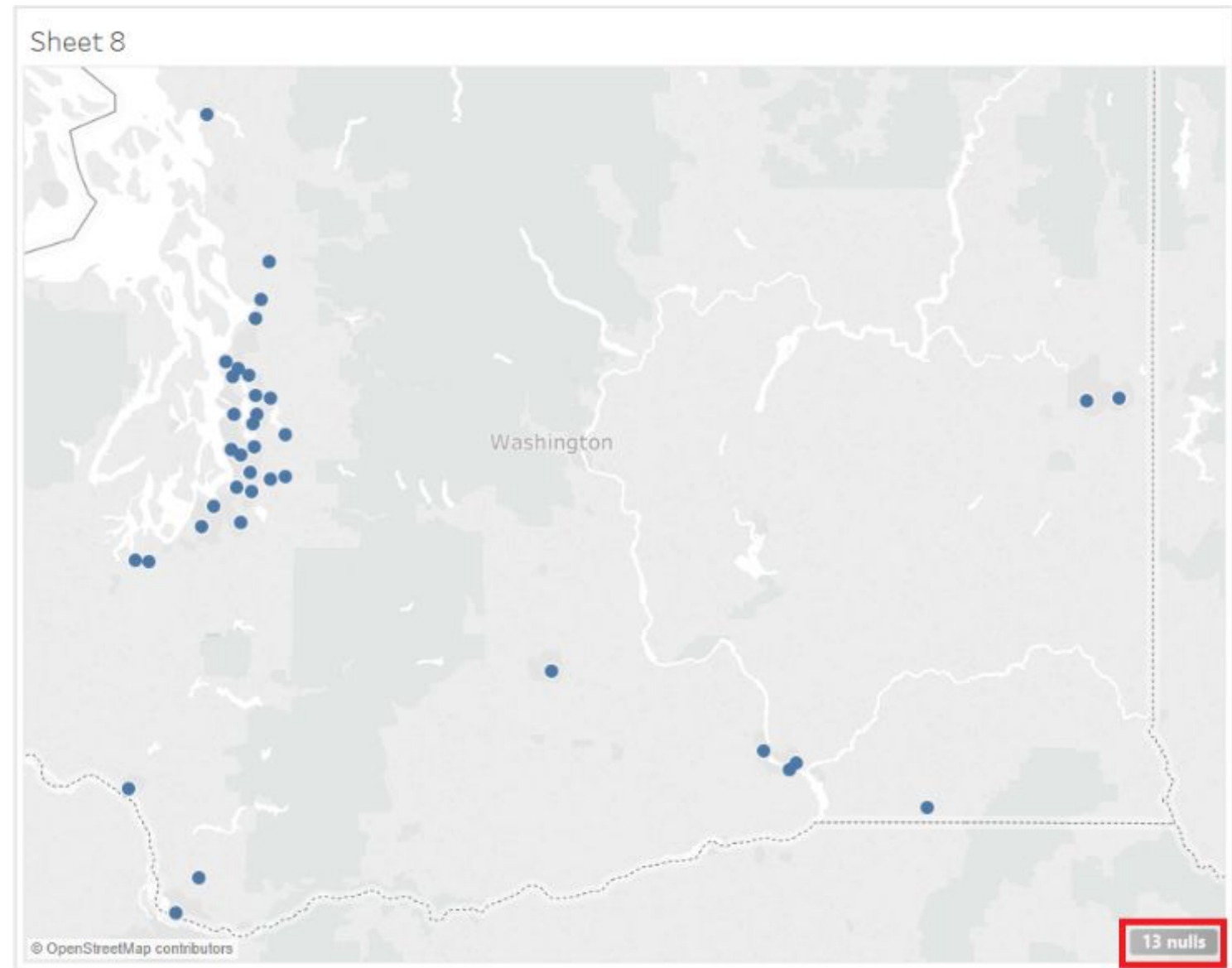


# Maps and filtering

Now, let's look at the map again. This time there are 13 unrecognized records.

Getting rid of all the entity types but cities accounted for most of those values.

Now, what's left?



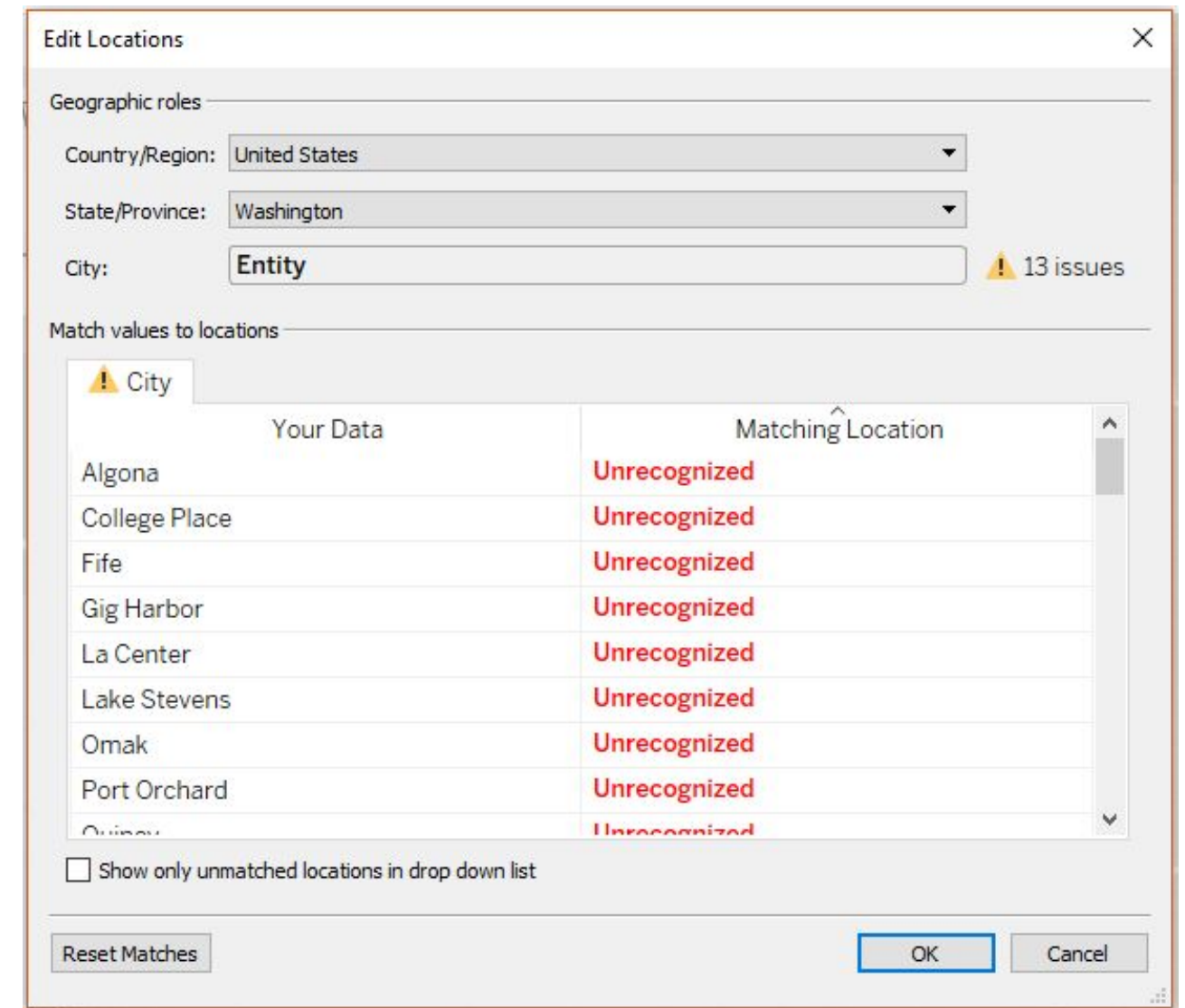


# Maps and filtering

Select the caret (down arrow) on the right of the pill for Entity. Go down to Geographic Role and then select City.

Now, let's look at the map again. This time there are 13 unrecognized records. Getting rid of all the entity types but cities accounted for most of those values. Now, what's left?

- Click on the 13 unknown and select edit locations. What do you see?

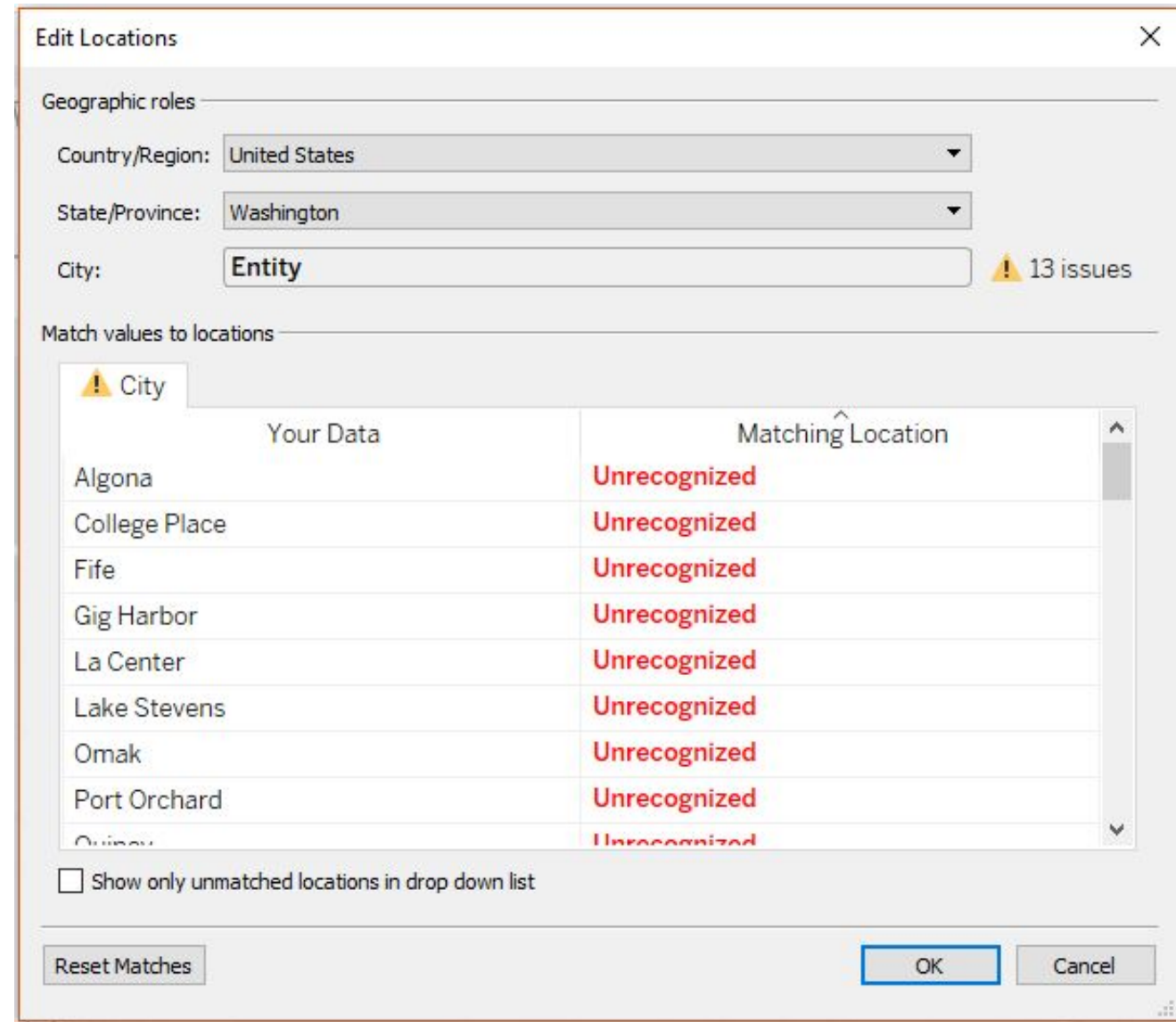


The screenshot shows the 'Edit Locations' dialog box. Under 'Geographic roles', 'Country/Region' is set to 'United States' and 'State/Province' is set to 'Washington'. The 'City' field contains 'Entity' and has a warning icon with '13 issues'. The 'Match values to locations' section shows a table with 'Your Data' and 'Matching Location' columns. The table lists several cities, all of which are marked as 'Unrecognized'. At the bottom, there is a checkbox for 'Show only unmatched locations in drop down list' and buttons for 'Reset Matches', 'OK', and 'Cancel'.

Your Data	Matching Location
Algona	Unrecognized
College Place	Unrecognized
Fife	Unrecognized
Gig Harbor	Unrecognized
La Center	Unrecognized
Lake Stevens	Unrecognized
Omak	Unrecognized
Port Orchard	Unrecognized
Quincy	Unrecognized

# Starting with maps

Okay, let's use the power of filtering again to check on whether these are small towns.



The 'Edit Locations' dialog box is shown with the following settings:

- Geographic roles:
  - Country/Region: United States
  - State/Province: Washington
  - City: Entity
- Match values to locations: 13 issues (indicated by a warning icon)

The 'City' tab is selected, showing a table with the following data:

Your Data	Matching Location
Algona	Unrecognized
College Place	Unrecognized
Fife	Unrecognized
Gig Harbor	Unrecognized
La Center	Unrecognized
Lake Stevens	Unrecognized
Omak	Unrecognized
Port Orchard	Unrecognized
Quincy	Unrecognized

At the bottom of the dialog, there is a checkbox labeled 'Show only unmatched locations in drop down list' which is currently unchecked. Below the table are three buttons: 'Reset Matches', 'OK', and 'Cancel'.

# Maps and filtering

We've gone from 13 unknown values to 2 unknown values, just by filtering out what we didn't need. But there are two cities that Tableau doesn't recognize that have a population of 10,000 or greater. We don't want to exclude them from our analysis or our reporting, so how do we get those cities on the map?

Edit Locations ✕

Geographic roles

Country/Region:

State/Province:

City:  ! 2 issues

Match values to locations

! City

Your Data	Matching Location
Lake Stevens	Unrecognized
Port Orchard	Unrecognized

# Maps and filtering

- Click on the caret to the right of the field under **Matching Location**.

You'll see that there is an option for entering the latitude and longitude. Let's do that.

- Do a Google search for the latitude and longitude and plug those numbers in.

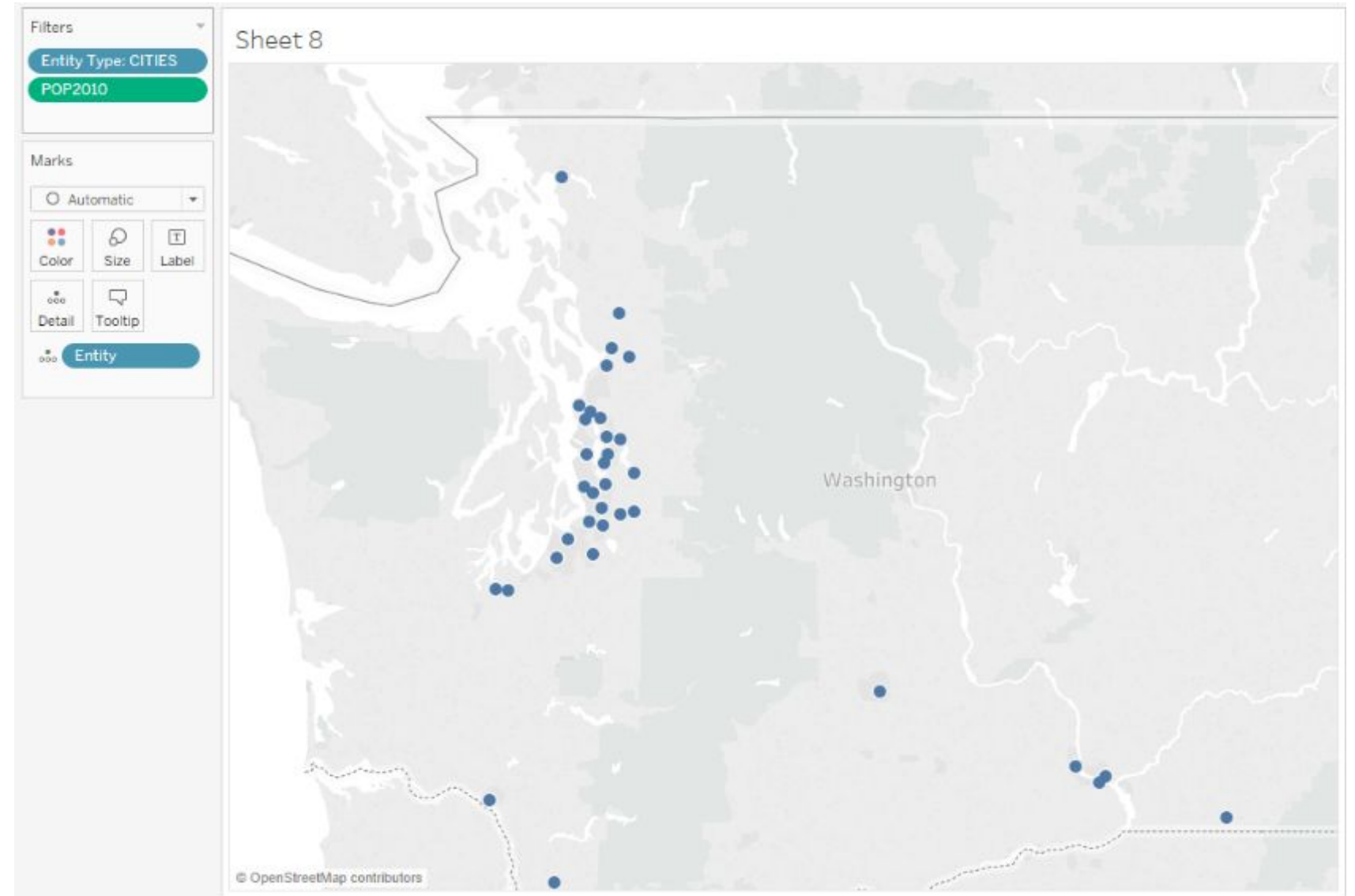
The screenshot shows a data entry interface. At the top, there is a 'City:' field with the value 'Entity' and a warning icon indicating '2 issues'. Below this is a section titled 'Match values to locations'. It contains a table with two columns: 'Your Data' and 'Location'. The 'Your Data' column lists several cities: Lake Stevens, Port Orchard, Arlington, Auburn, Battle Ground, and Bellevue. The 'Location' column is currently empty. A modal dialog box titled 'Enter Latitude and Longitude' is open over the table. It has two input fields: 'Latitude:' with the value '48.015098' and 'Longitude:' with the value '-122.0637425'. There are 'OK' and 'Cancel' buttons at the bottom of the modal.

Now, latitude and longitude can be expressed in degrees or in decimal form. We want the decimal form. Here's another hint: we are in the Western Hemisphere, so our longitude will be a negative decimal number.

# We have a map!

You now should have a map of cities with a population of 10,000 or more. Let's see how we can visually explore this data.

Try exploring both the total cities paid for lobbying at the legislature and the per capita rate.

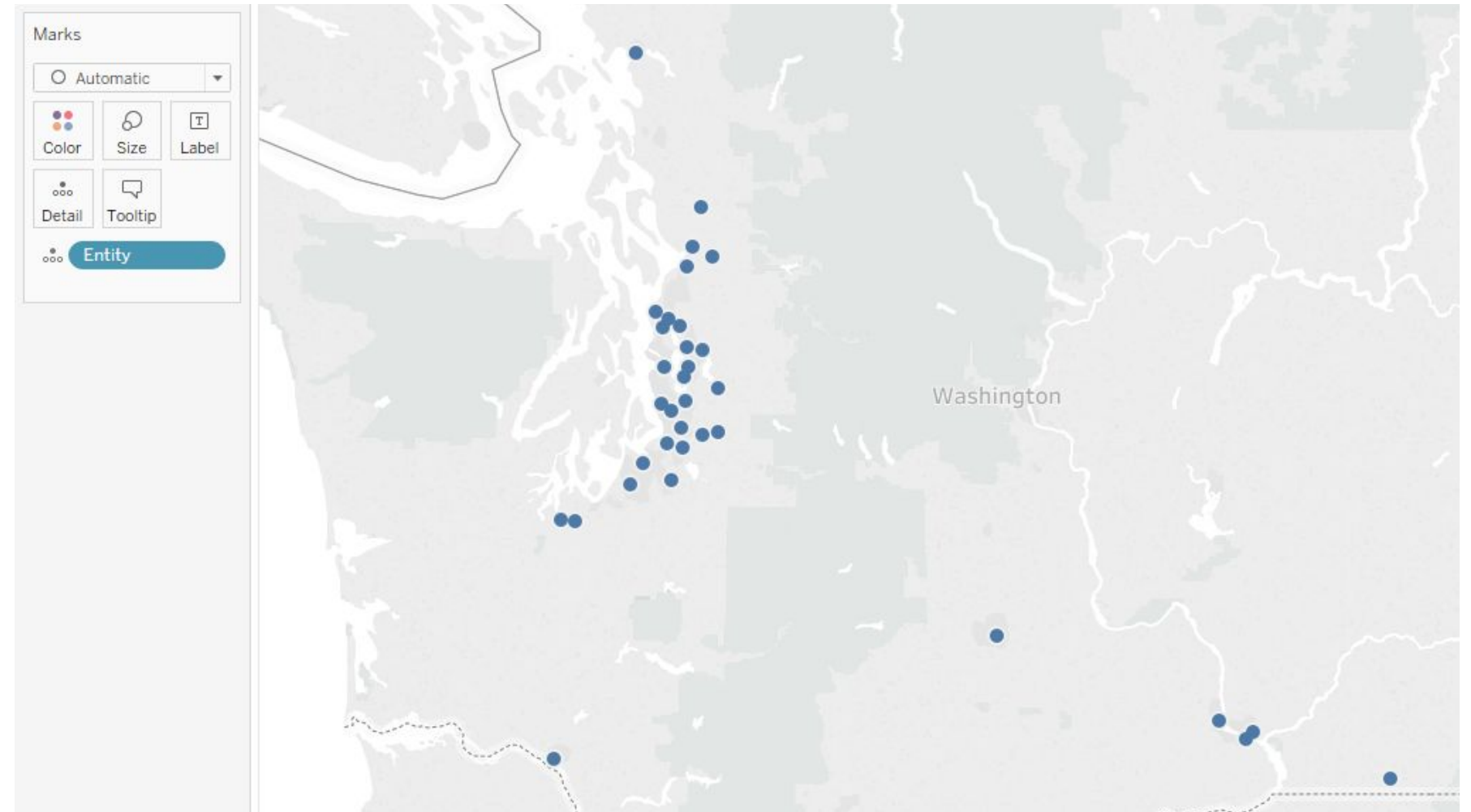




# Exploring with maps

Just looking at dots on a map is not particularly useful.

Try exploring both the total cities paid for lobbying at the legislature and the per capita rate.



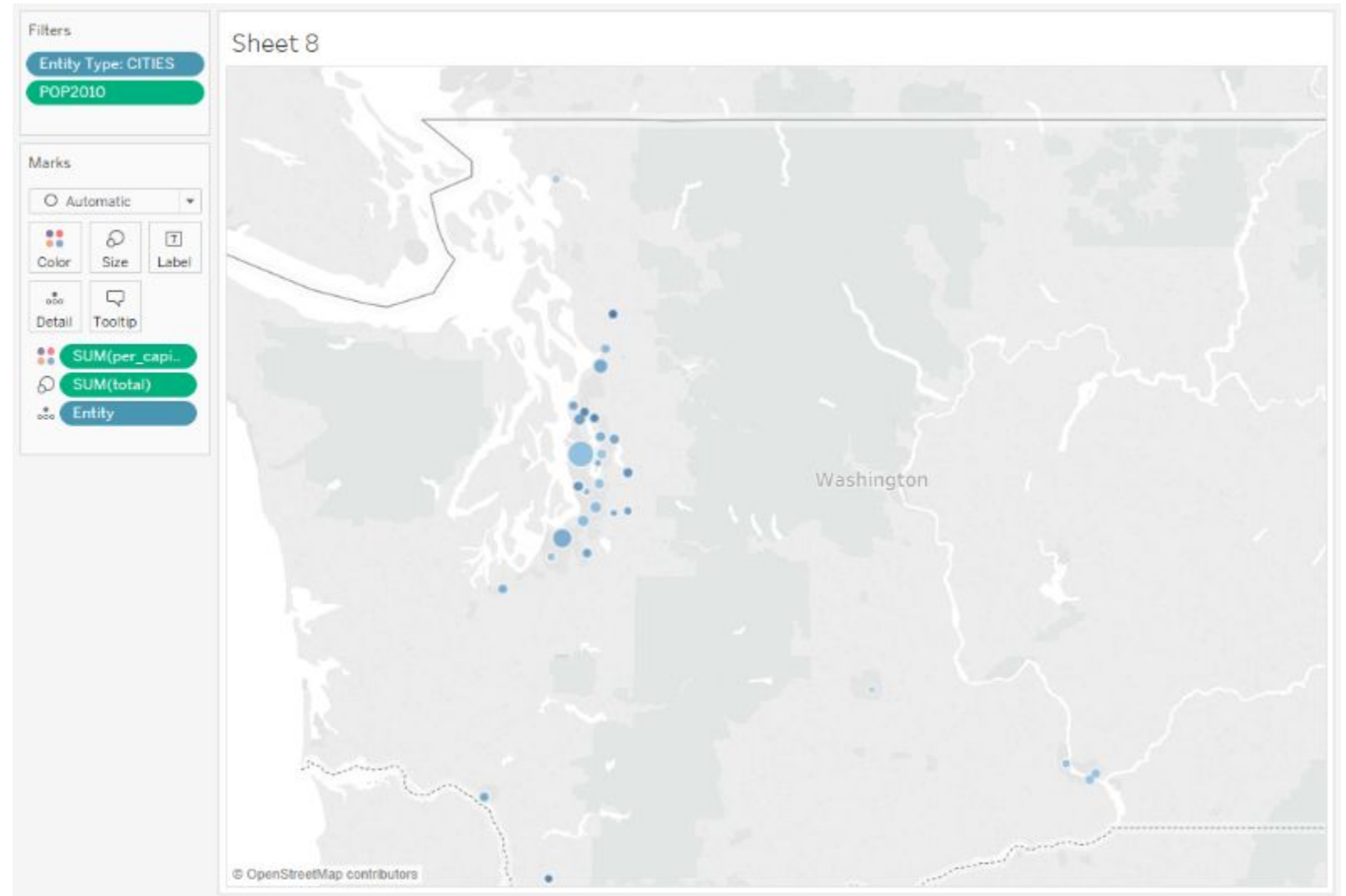


# Exploring with maps

Maps in Tableau are really another type of chart. And as with any chart, you can change the size and color of what you are exploring.

- Drag the per capita onto color.
- Next, drag total onto size.

Now, let's edit this a bit to make the patterns easier to see.



# Exploring with maps

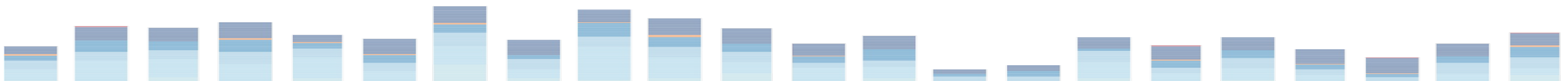
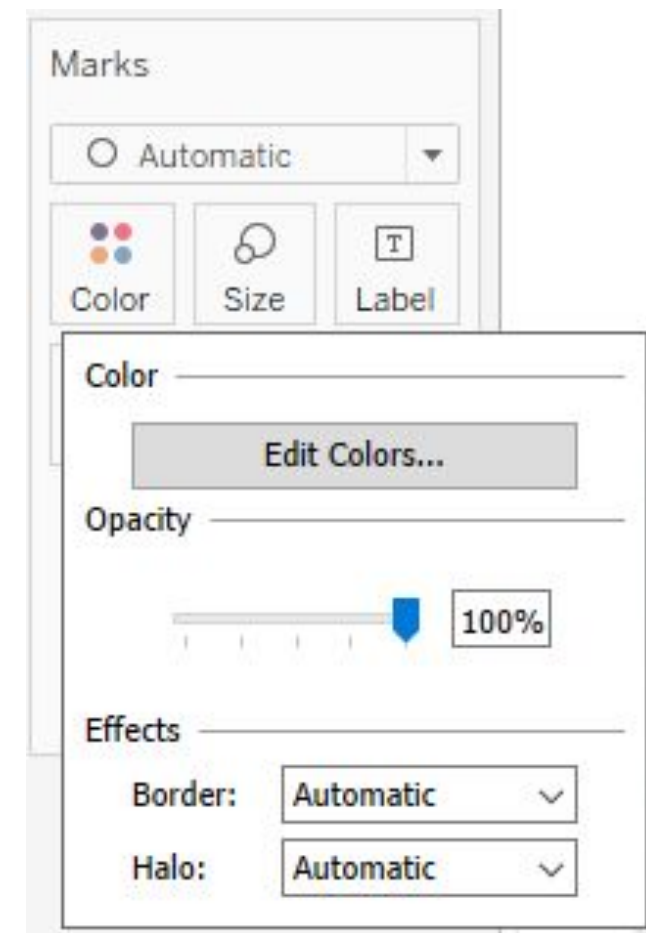
We can adjust our palette here. Let's first select stepped colors, which groups the total paid by each city government into bins.

- Click on **color** and then select **edit colors**.

That makes it easier to see different parts of the range. We can also select the number of bins.

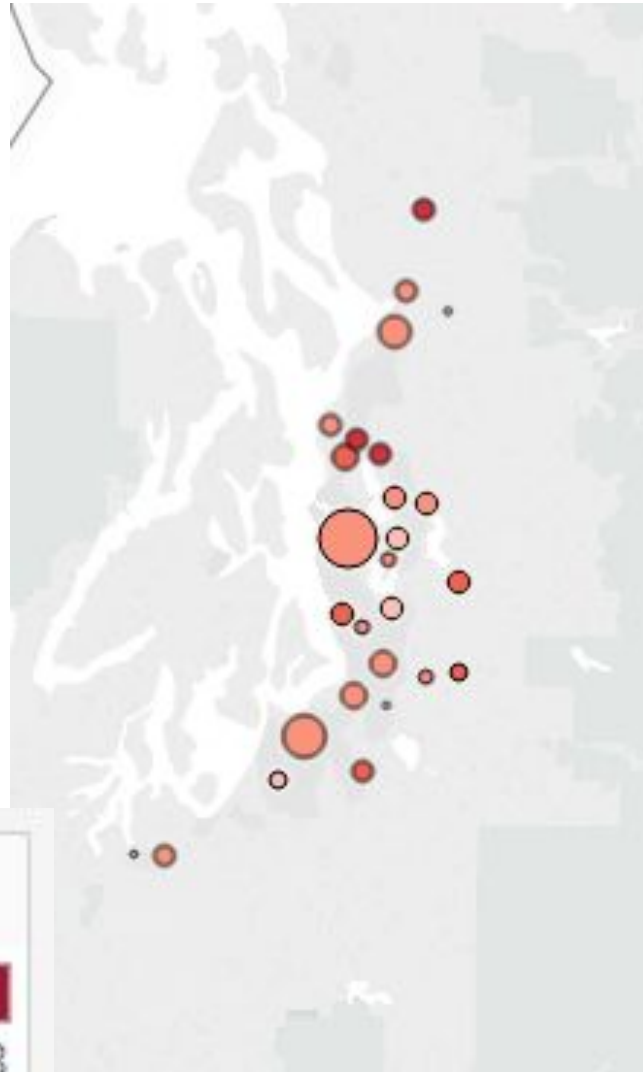
Our goal is to make it easier to see the various ranges and not let Seattle overwhelm the other cities. Play around with the bins and the range.

Try using the advanced settings to set the starting range at 0, which reduces the number of circles in the grey range. Now, try making that a negative number and see what happens.



# Exploring with maps

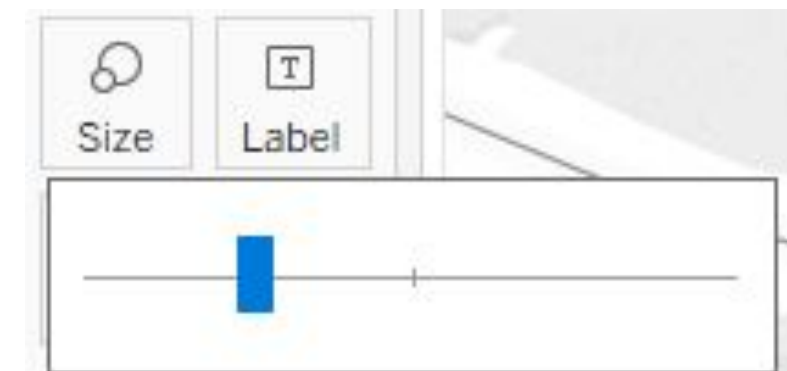
Here is an example, where the range was changed to begin at  $-.3$  and the color ramp is shades of red. The circles also have been given boundaries, which help to make them easier to see. Try doing all of those things as well.



We haven't edited the size ranges yet. Let's do that next.

- Click on the **size icon** and you can then adjust the size of the bubbles.

Again, our goal is clarity.



# In-Class Exercise

Map both the vehicle stop data and the collision data by joining each with `pd_beats_datasd.geojson`

Explore the results. At the end of the class we will share what we learned.

