Chapter 8

An Overview of Tableau Public Visualizations

Summary: Tableau Public is a free, cloud-based version of the Tableau Desktop application widely used for enterprise visualization and analysis of data that is constantly being updated. It is capable of extremely sophisticated, multi-panel visualizations and can be extensively customized.

As is the case with many cloud-based programs, Tableau has a free or "Public" version, and a desktop version that comes with a price tag. Though the desk version has many advantages, the public version will do just fine for most of the visualizations that journalists use employing relatively small datasets.

Tableau Public is available in a PC and a Mac version. We will demonstrate using the PC version, but the differences are minimal, beyond the normal operating-system-driven differences.

The advantage of Tableau is its interactivity; that is, it's ability to use dashboards that can house a few tables, or maps that are interactive. Tableau has a wonderful website with many examples with easy-to-follow tutorials.

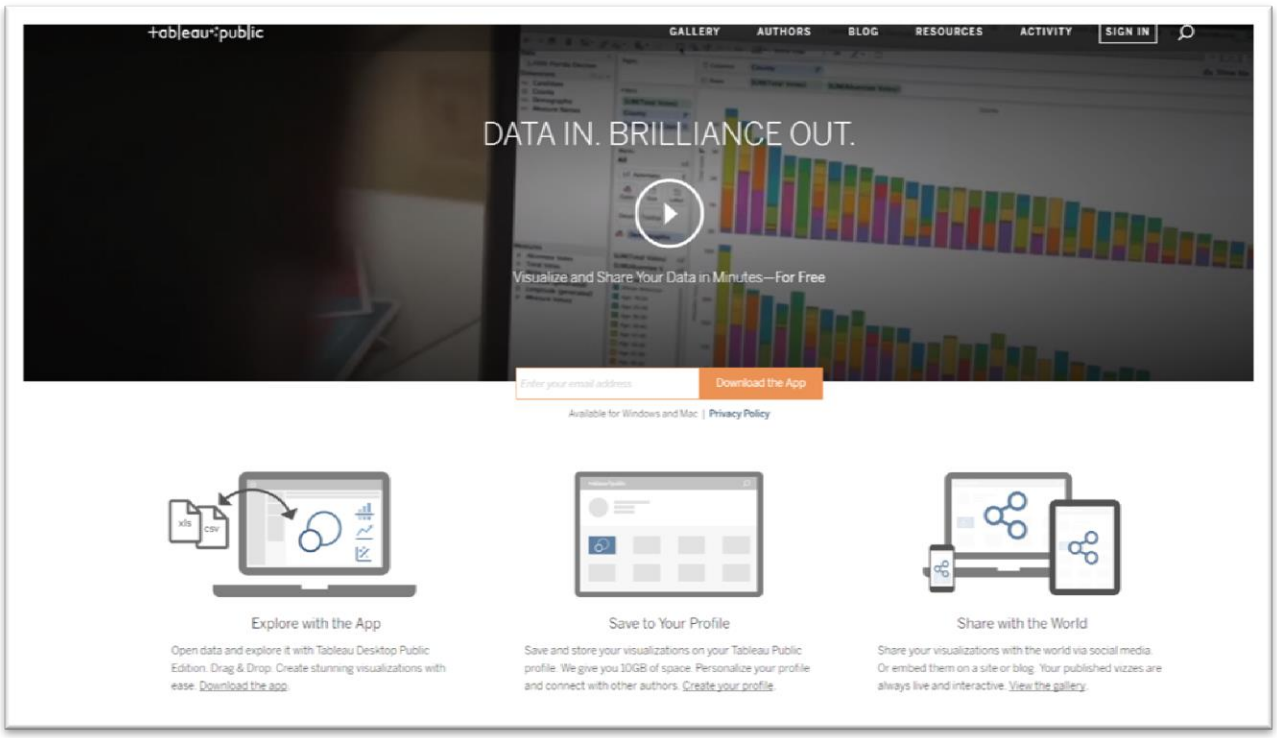
For this exercise, we will use Statistics Canada's crime data that breaks down offences for Canada as a whole, the provinces and major cities. (NOTE: To get a more detailed breakdown, you'd have to contact Statistics Canada. But avoid doing so on deadline.)

What you will learn:

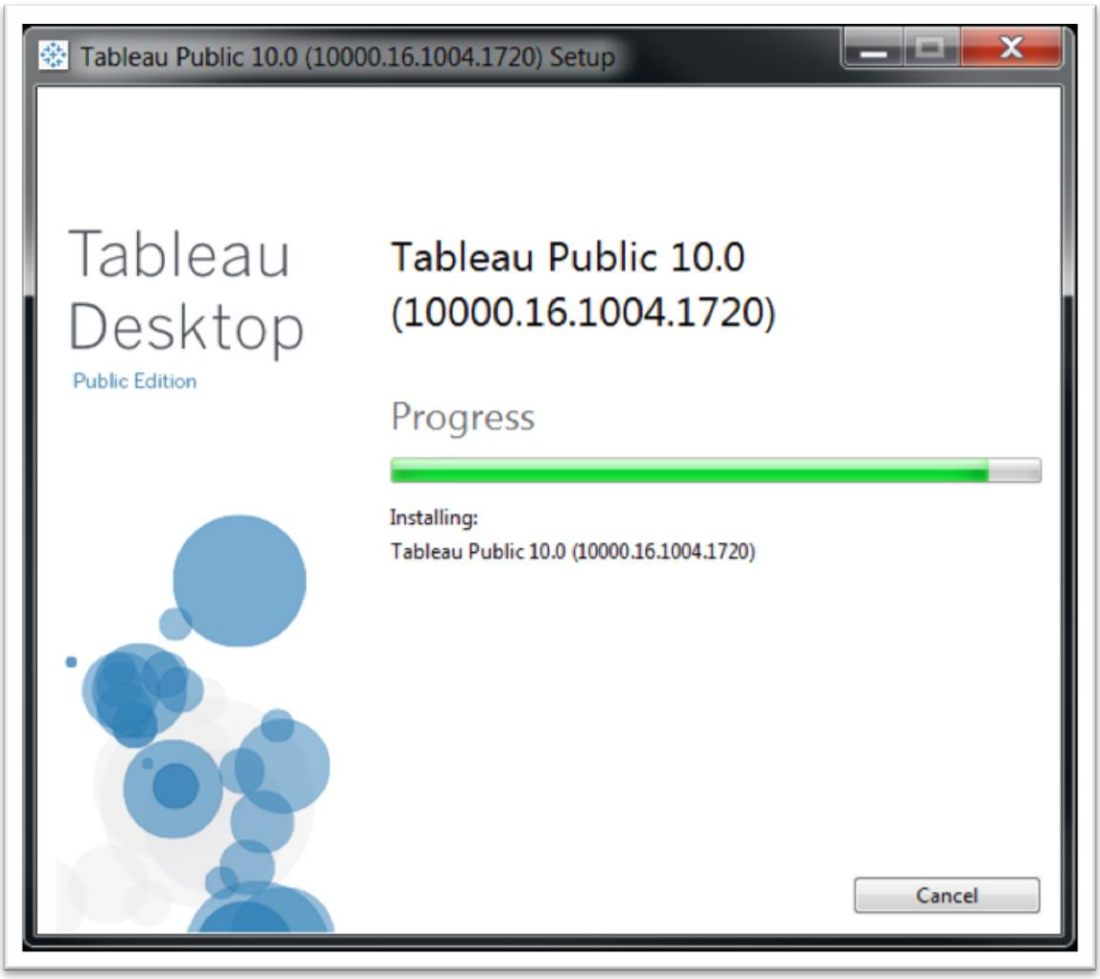
1. Uploading tables to Tableau Public.
2. Reshaping the table to prepare it for analysis.
3. Creating worksheets and a dashboard.
4. Saving and embedding the visualization in your blog post.

Task 1: Uploading tables to Tableau Public.

When you open the program for the first time, you'll see a screen that should look something like this:



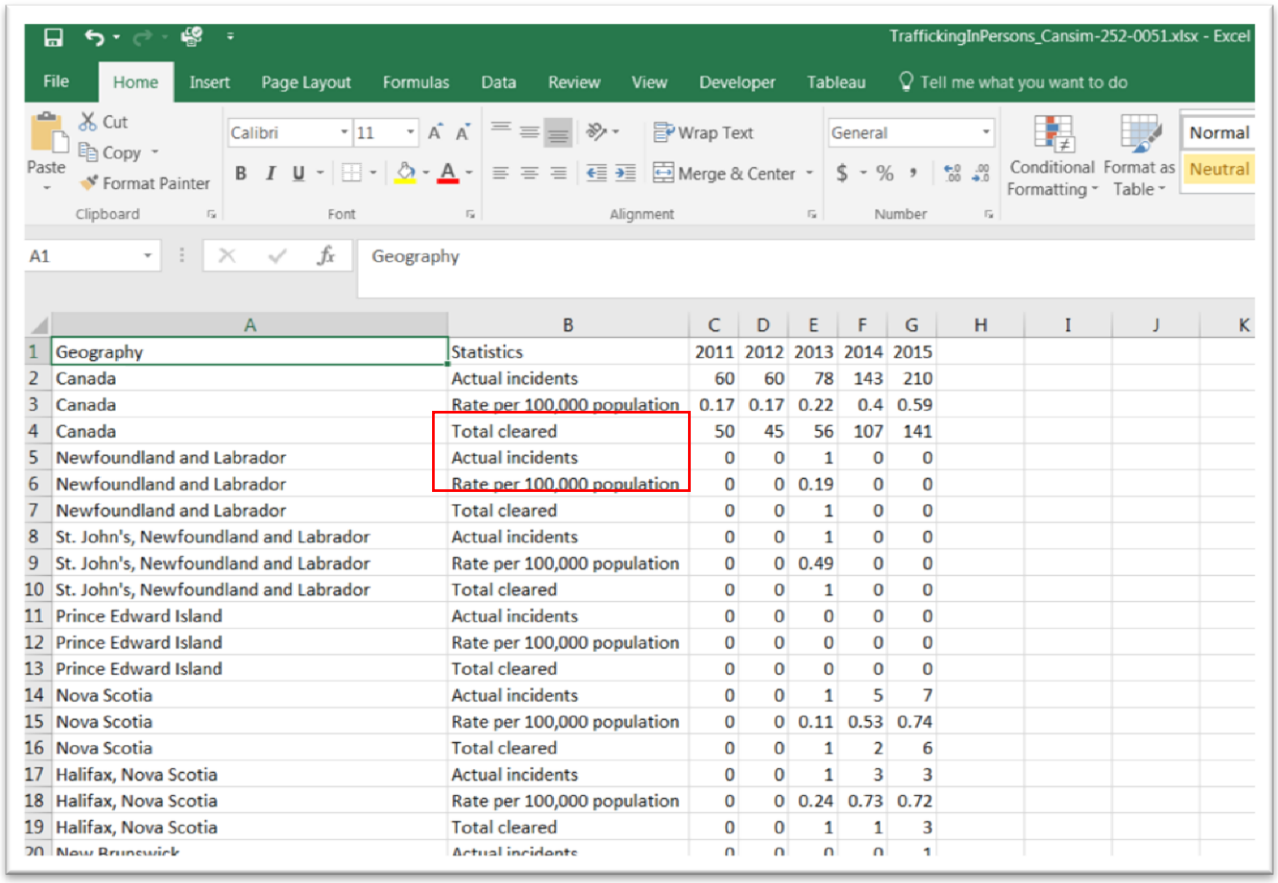
If you don't already have an account, you can save some money and use the most recent version of the public version downloading the App and signing up.



Once you've done so, you'll be able to connect directly to your data, which can be in an Excel workbook, a Text file, or in Access, which was covered in Chapter 5.

The table we'll be using for this tutorial is located in an Excel workbook that you can download by clicking here.

But before we do so, a quick word about the data that Tableau uses to visualize. It's best if the data is in raw format with one record per row. Below is the dataset we'll be using, which is a filtered table from Statistics Canada's "Incident-based crime statistics" dataset, a compilation of the dozens of violations (from murder to assault to fraud and break-and-enter) broken down national, by province and territory and the largest cities in each of those jurisdictions. Below you'll see incidents of human trafficking, an offence, which has become a serious problem in surprising areas of the country.



TraffickingInPersons_Cansim-252-0051.xlsx - Excel

File Home Insert Page Layout Formulas Data Review View Developer Tableau Tell me what you want to do

Cut Copy Format Painter Paste Clipboard

Calibri 11 Font

Wrap Text Merge & Center Alignment

General Number

Conditional Formatting Format as Table Normal Neutral

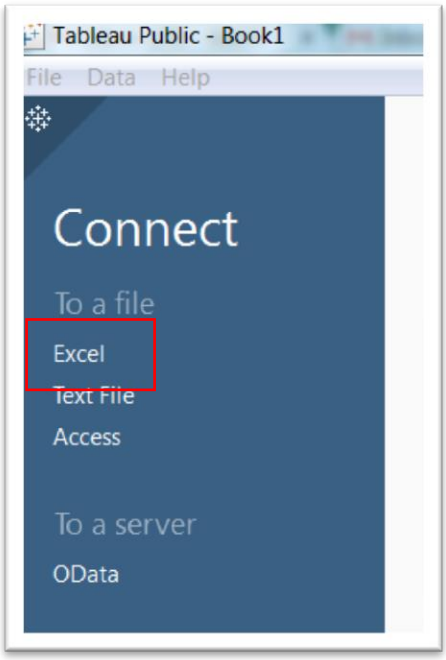
A1 Geography

	A	B	C	D	E	F	G
1	Geography	Statistics	2011	2012	2013	2014	2015
2	Canada	Actual incidents	60	60	78	143	210
3	Canada	Rate per 100,000 population	0.17	0.17	0.22	0.4	0.59
4	Canada	Total cleared	50	45	56	107	141
5	Newfoundland and Labrador	Actual incidents	0	0	1	0	0
6	Newfoundland and Labrador	Rate per 100,000 population	0	0	0.19	0	0
7	Newfoundland and Labrador	Total cleared	0	0	1	0	0
8	St. John's, Newfoundland and Labrador	Actual incidents	0	0	1	0	0
9	St. John's, Newfoundland and Labrador	Rate per 100,000 population	0	0	0.49	0	0
10	St. John's, Newfoundland and Labrador	Total cleared	0	0	1	0	0
11	Prince Edward Island	Actual incidents	0	0	0	0	0
12	Prince Edward Island	Rate per 100,000 population	0	0	0	0	0
13	Prince Edward Island	Total cleared	0	0	0	0	0
14	Nova Scotia	Actual incidents	0	0	1	5	7
15	Nova Scotia	Rate per 100,000 population	0	0	0.11	0.53	0.74
16	Nova Scotia	Total cleared	0	0	1	2	6
17	Halifax, Nova Scotia	Actual incidents	0	0	1	3	3
18	Halifax, Nova Scotia	Rate per 100,000 population	0	0	0.24	0.73	0.72
19	Halifax, Nova Scotia	Total cleared	0	0	1	1	3
20	New Brunswick	Actual incidents	0	0	0	0	1

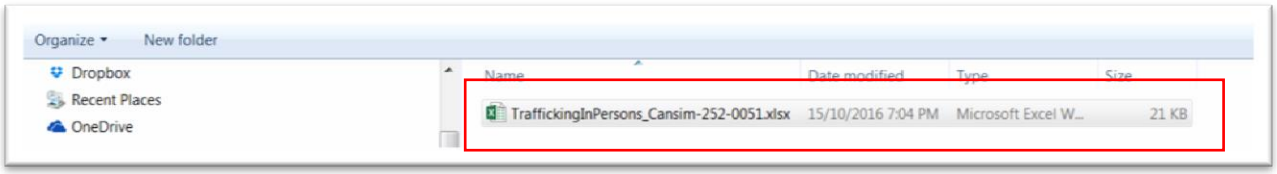
This is a cleaned-up version of the original data that's on the first worksheet in this Excel workbook. For this visualization, we cleaned up the names by removing the numbers beside them, deleted the "Violations" column, as we know that we're dealing with human trafficking. As for the statistics themselves, we filtered for three of them, which you can see in column B: the actual incidents; the rate (covered in Chapter 4); and the total cleared. Our visualization will display at least two of them on one worksheet called a dashboard.

Though Tableau is adept at cleaning, you want to do as much of it in your spreadsheet as possible.

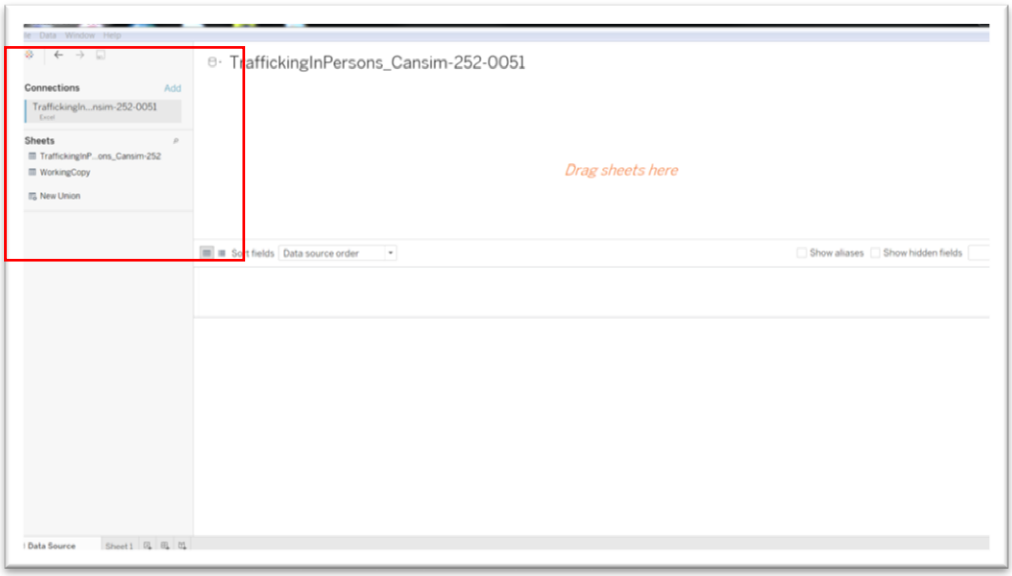
Now that you've got the Tableau icon saved on your desktop, open it.



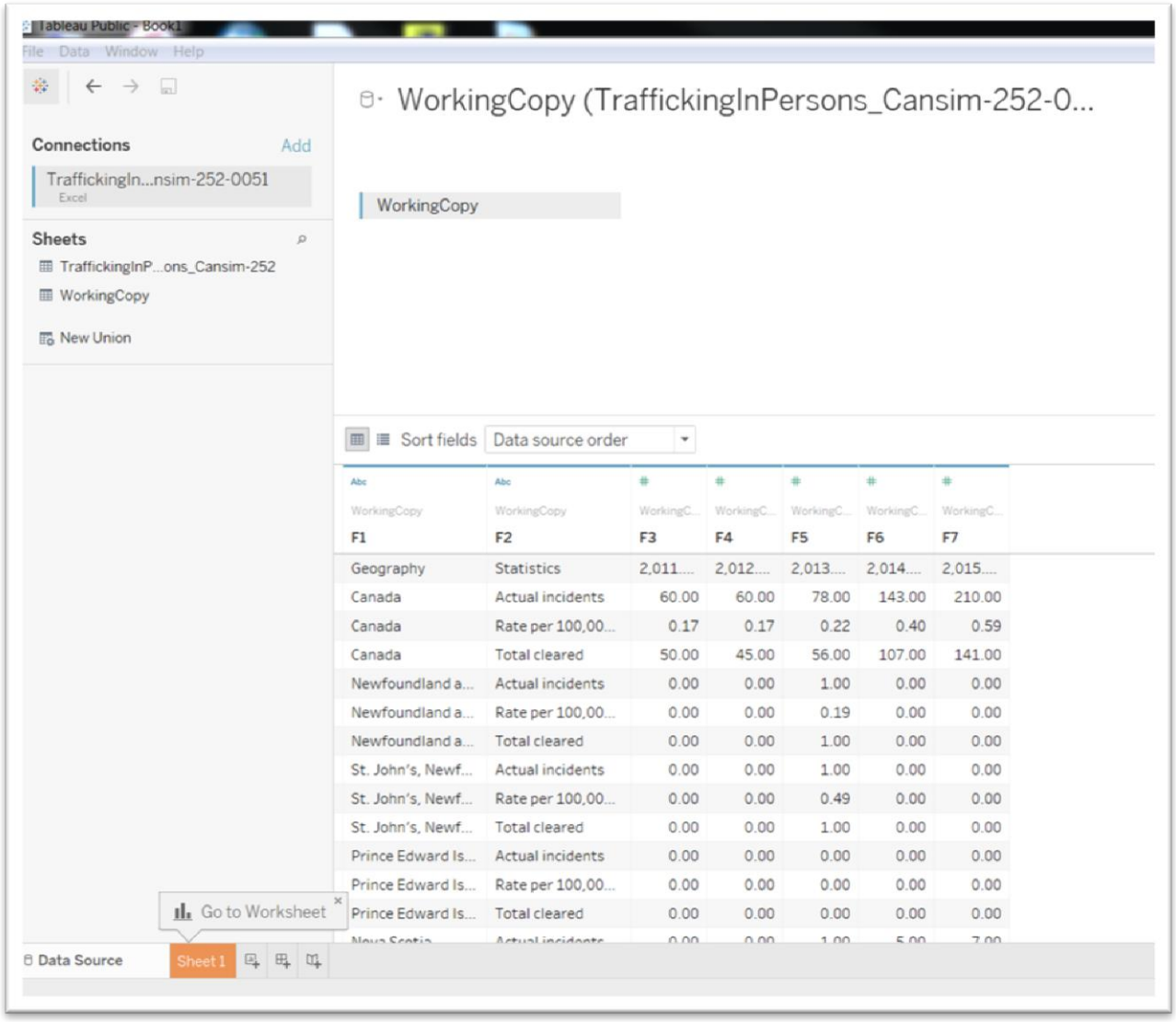
In this case, we want to connect to an Excel file. Click the word Excel, which allows you to browse for the file.



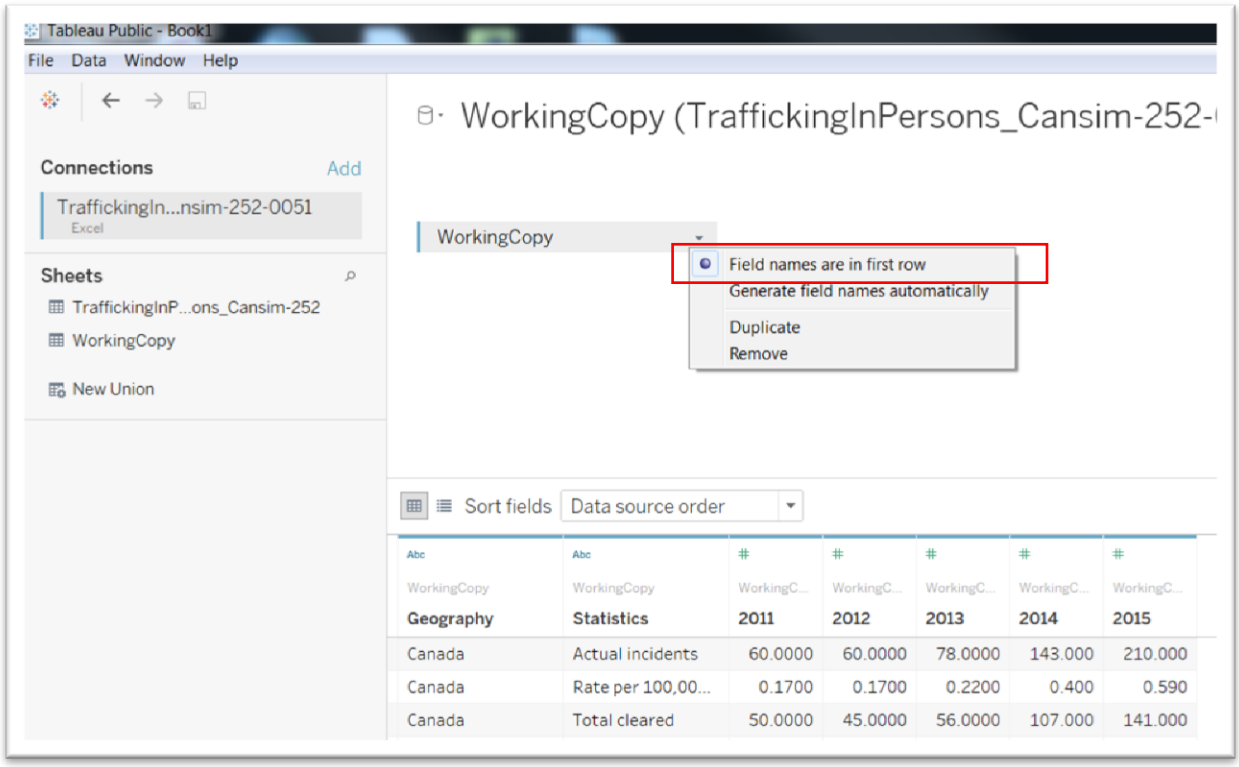
Once you select the file, you'll be taken to a screen that looks like this:



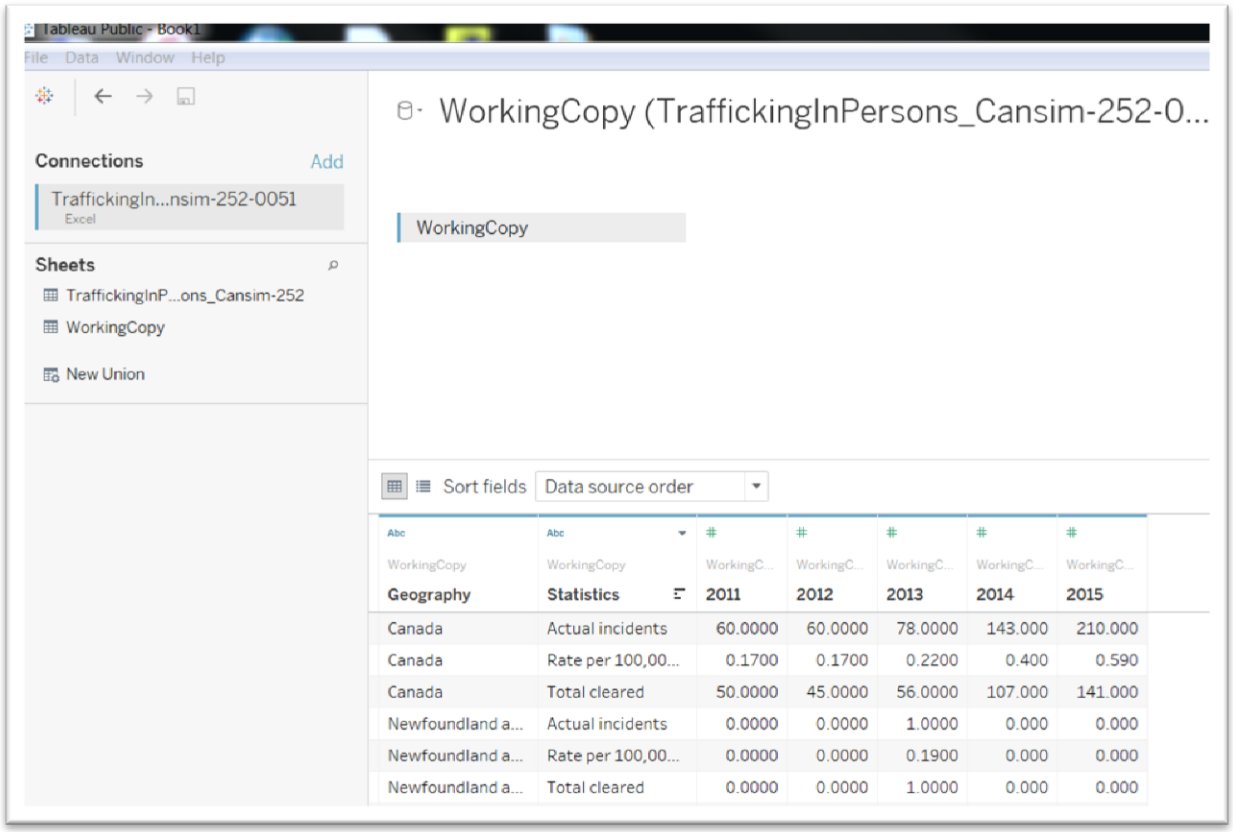
On your left, you'll see the Excel workbook's two worksheets: the original table, and the cleaned-up version. Drag the "WorkingCopy" tab into the "Drag sheets here" area to the right.



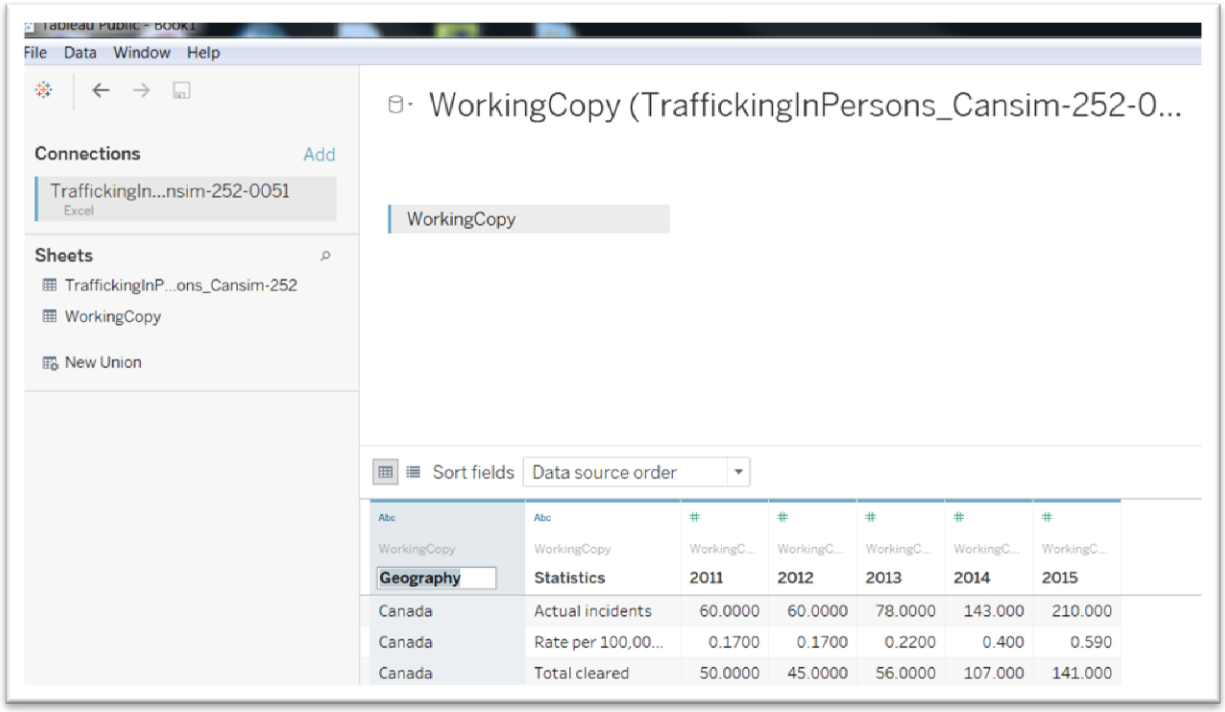
In the area below, is a preview of our dataset. We must eliminate the generic column names. To do so, click to the right of the "WorkingCopy" tab to obtain a drop-down menu.

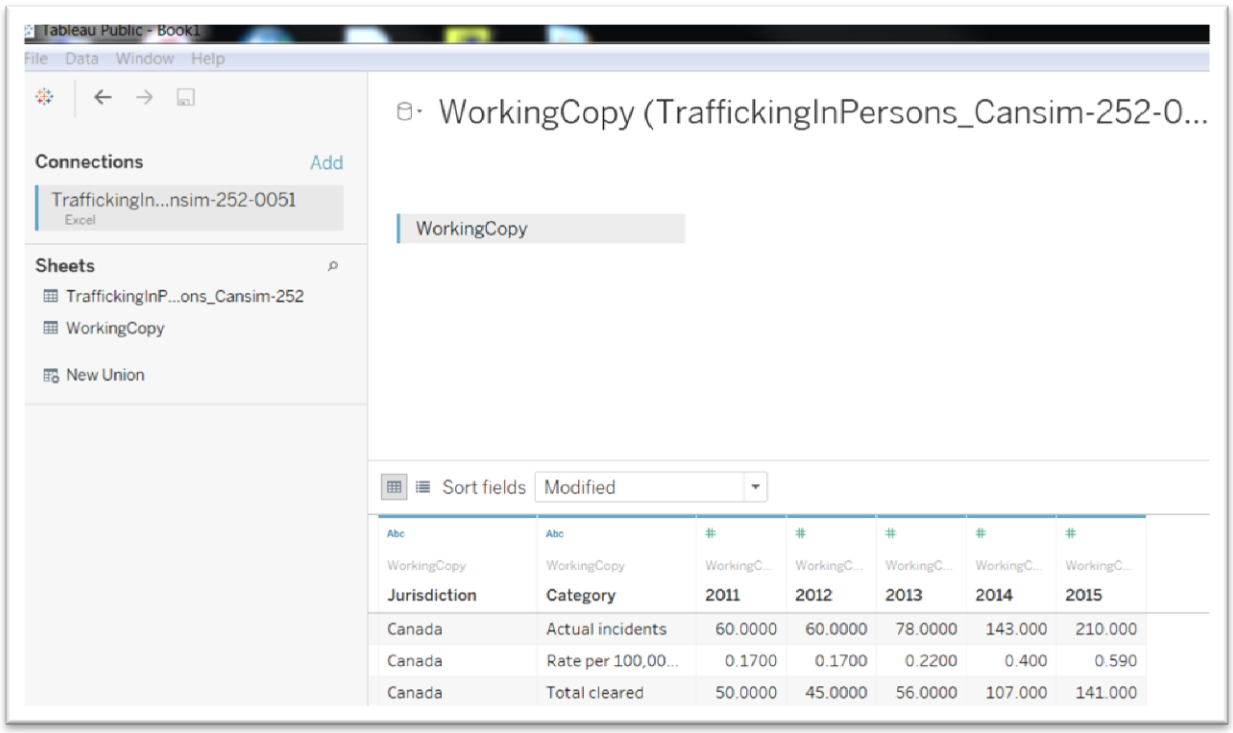


Select the first option.



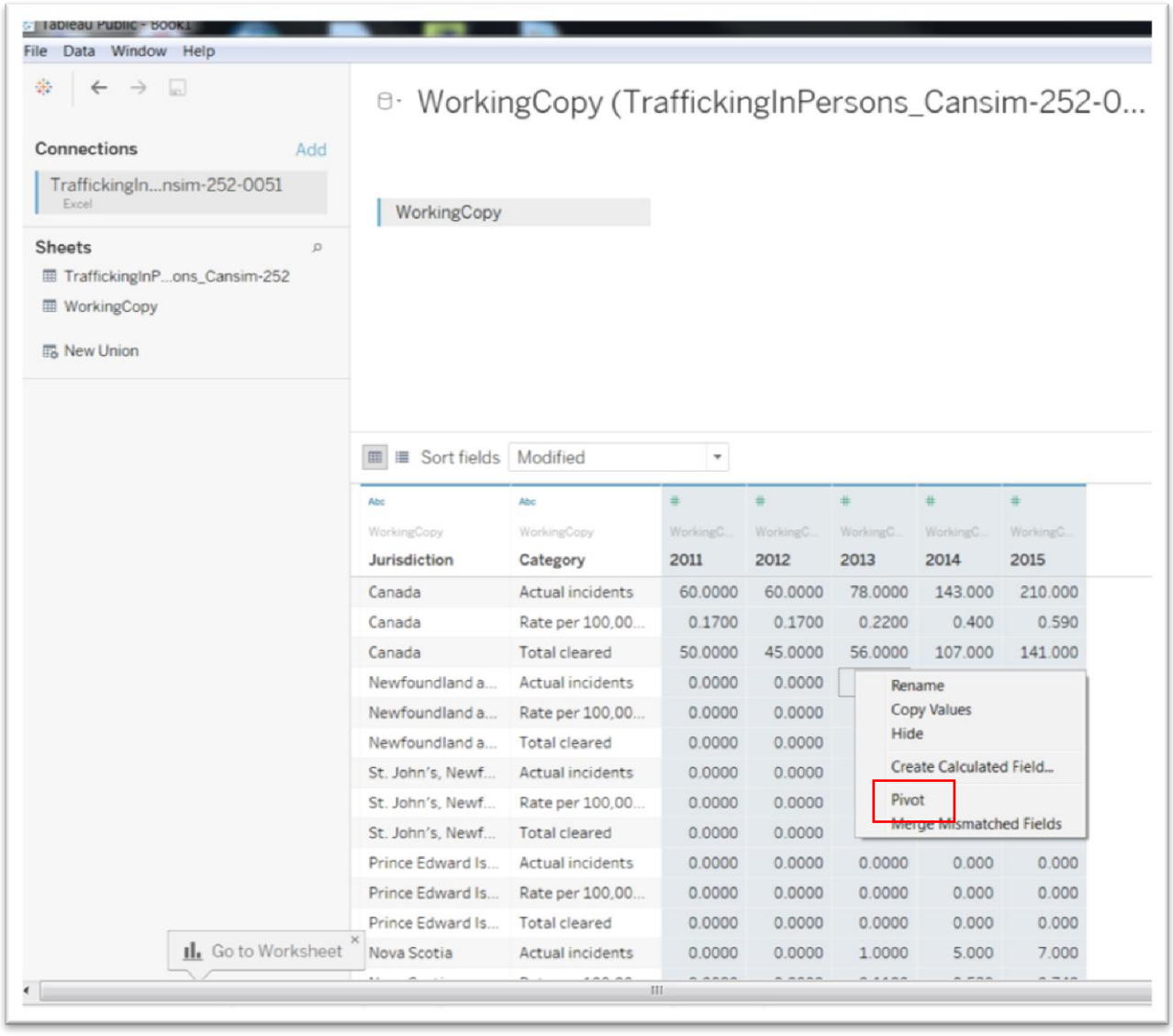
That's better. Now every column has a title. Because of the reformatting we're about to do, let's rename the first two columns so that they make more sense when we get further into this tutorial. Let's call them "Jurisdiction" and "Category". To do so, double-click on the field name to type a new one.



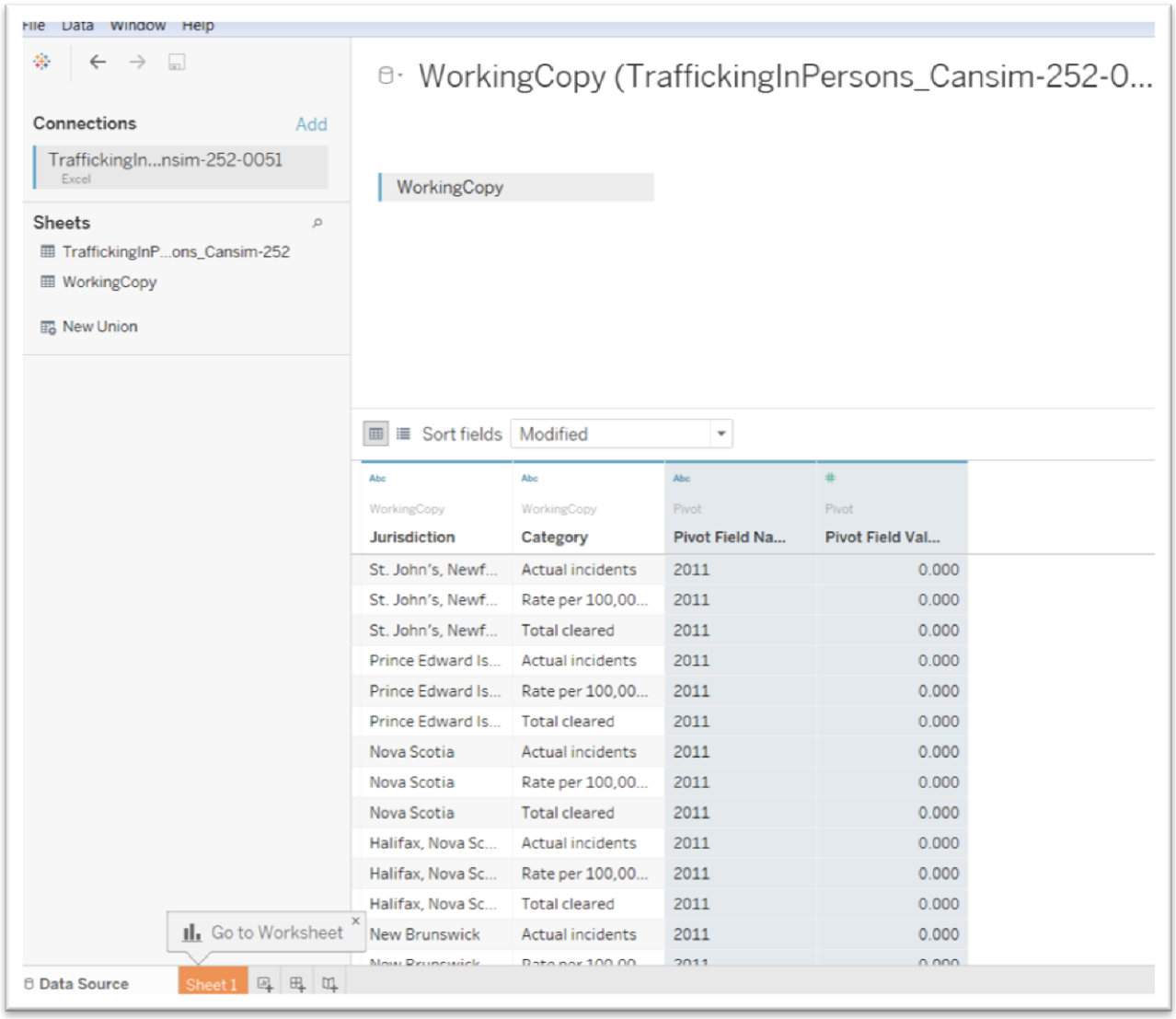


Now we want to "pivot" the table so that the [Jurisdiction] and [Category] cells in the first row, are followed by the [Year] the incident took place, and the number. Select each column until they're all highlighted.

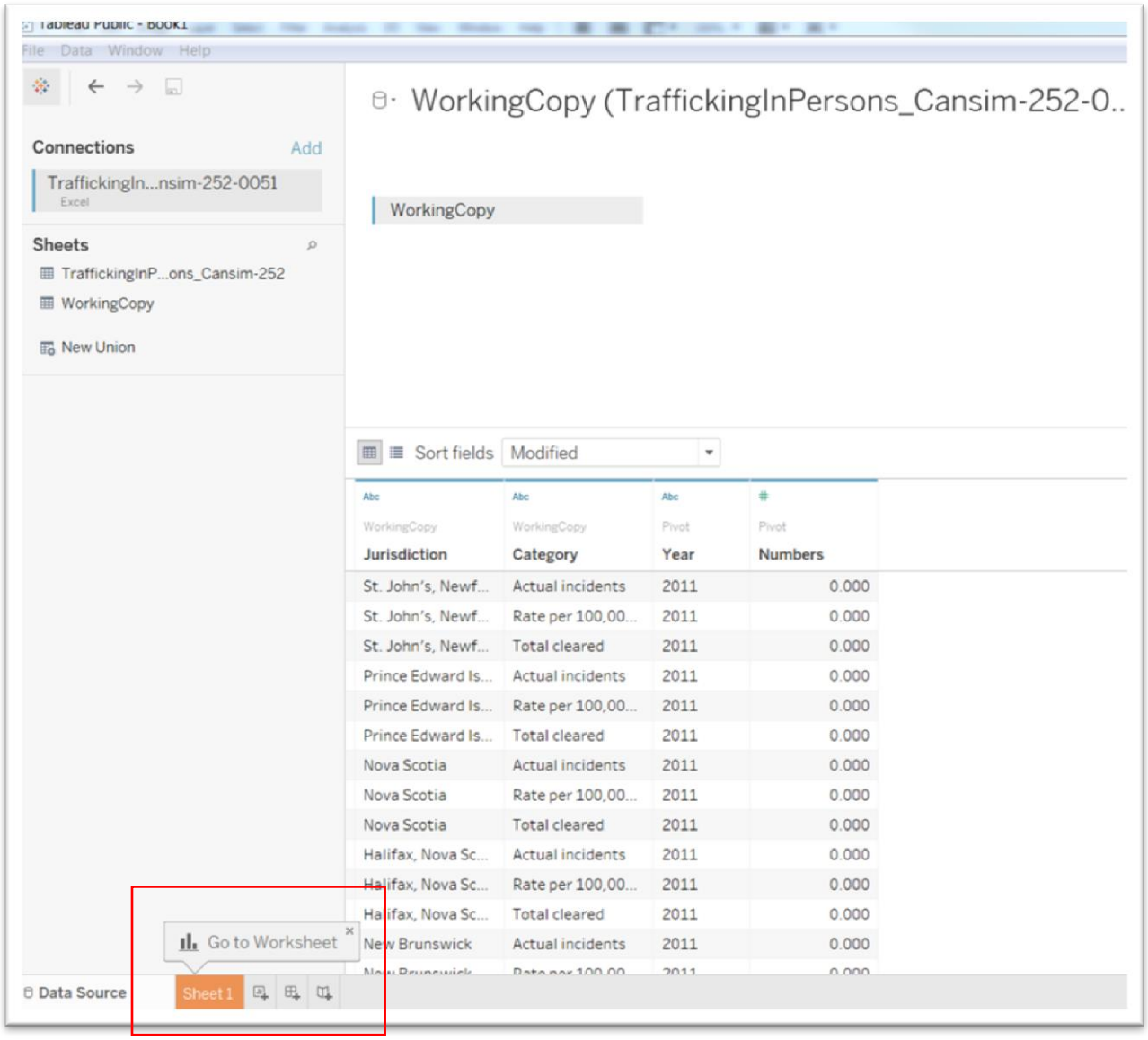
Right click to obtain a menu that give you the option to "pivot".



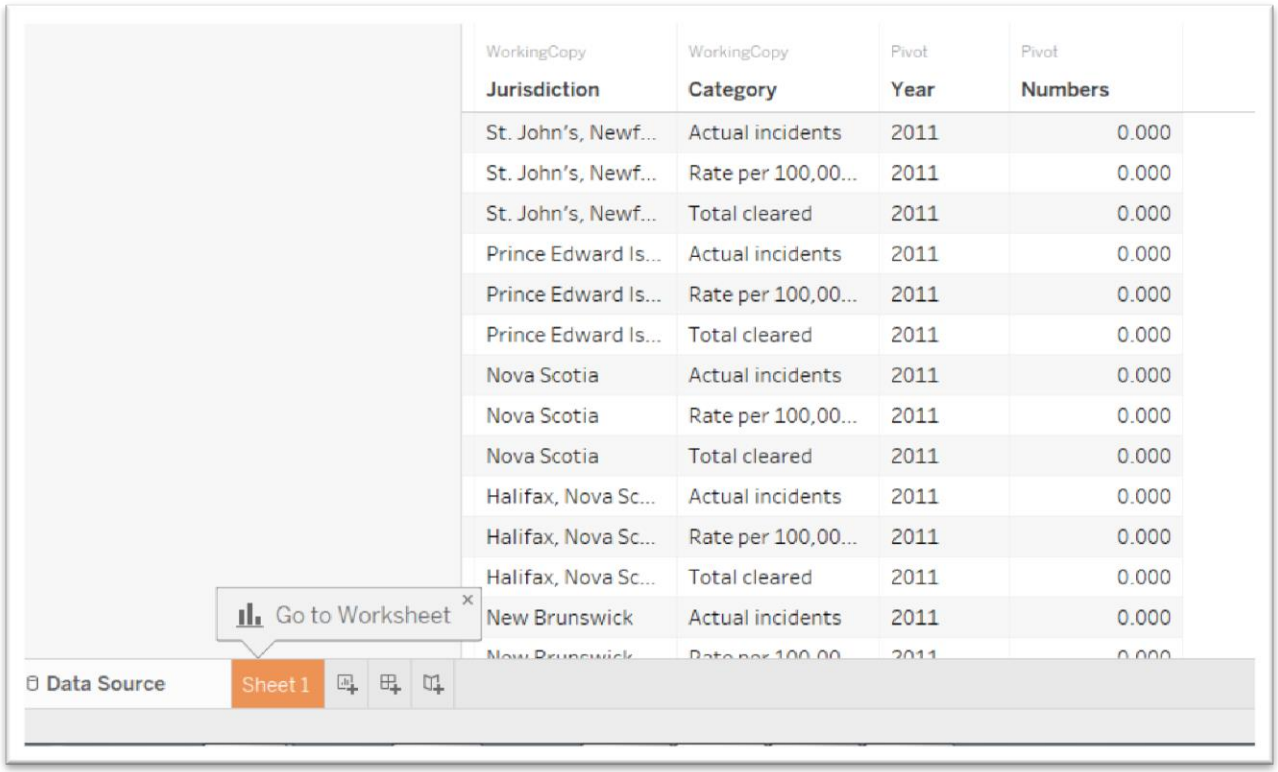
Select “Pivot.”

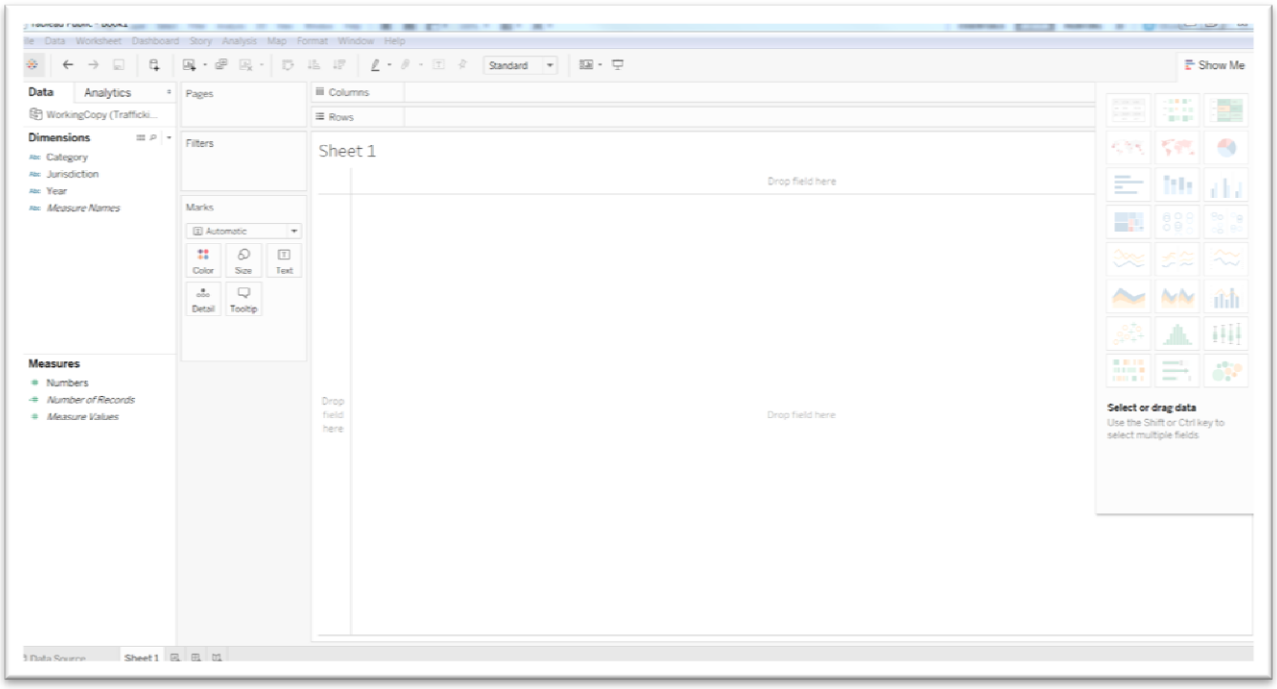


Rename the two new columns [Year] and [Numbers], respectively.



Now we have a table that Tableau can work with. Click on the "Go to Worksheet," table located at the bottom left of your table.





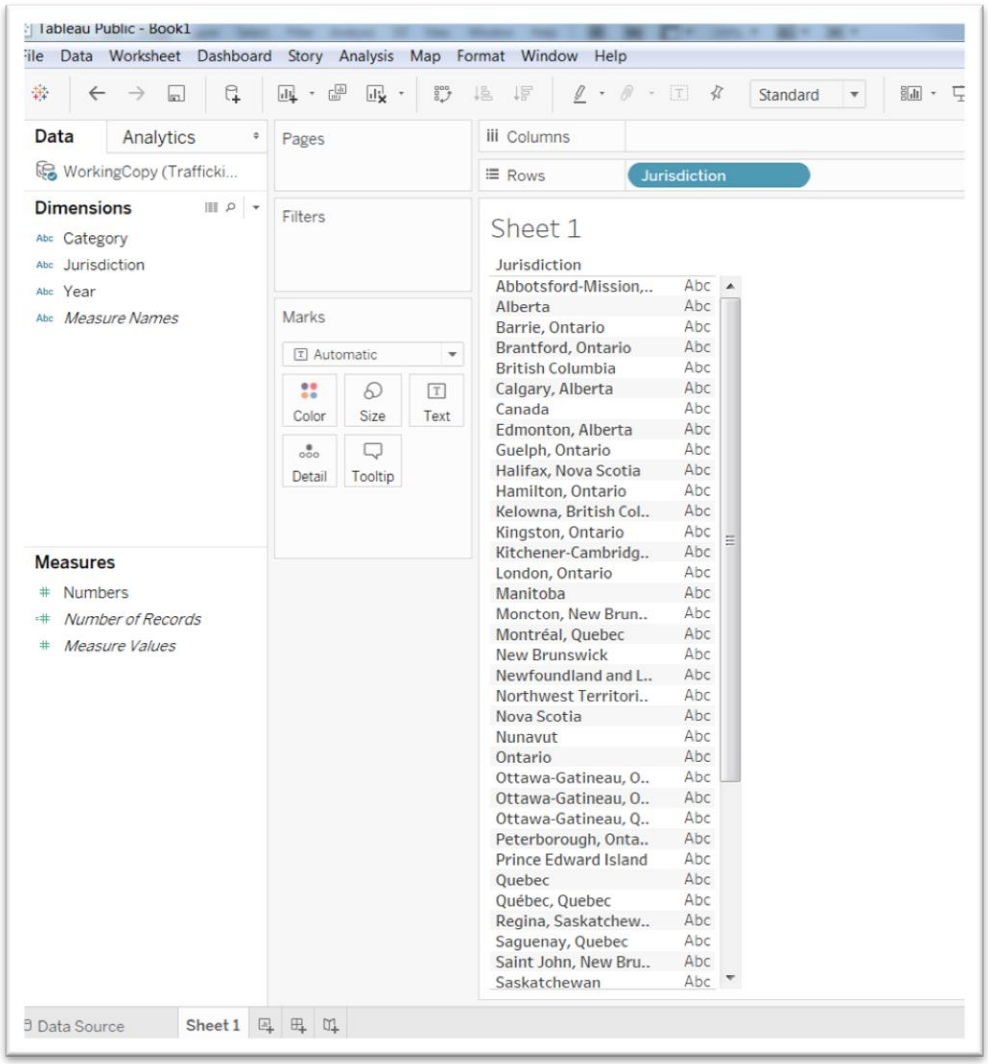
The interface resembles a spreadsheet's pivot table worksheet. Like a pivot table, which we learned about in Chapter 4, Tableau will summarize the data in ways that enable analysis and visualization.

On the left side of the screen, you will see panes for what Tableau calls "dimensions" and "measures." Dimensions are categories of information; measures are numbers. If you find that a number (a measure) has been misclassified as a dimension, just drag the field from the dimension to the measures area (the opposite applies as well). This is important, because if, for example, a number is misclassified as a measure, then Tableau cannot perform any math on it.

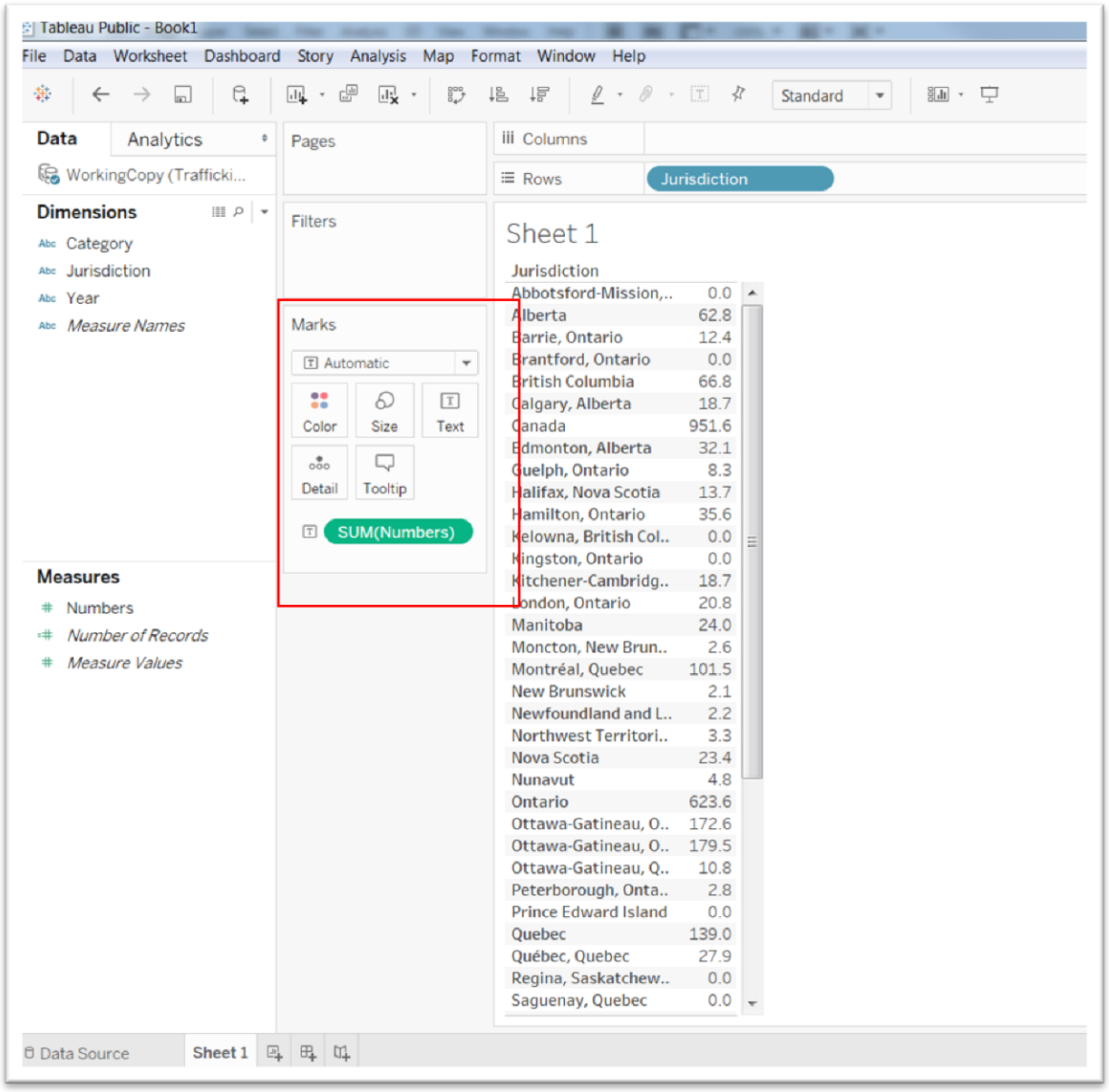
On the right side is a canvas, which will contain your visualizations.

Like Excel and other spreadsheet programs, Tableau uses the term "worksheet" to refer to a screen that contains data. However, Tableau also uses "dashboards," special screens that use two or more worksheets simultaneously to create an interactive visualization.

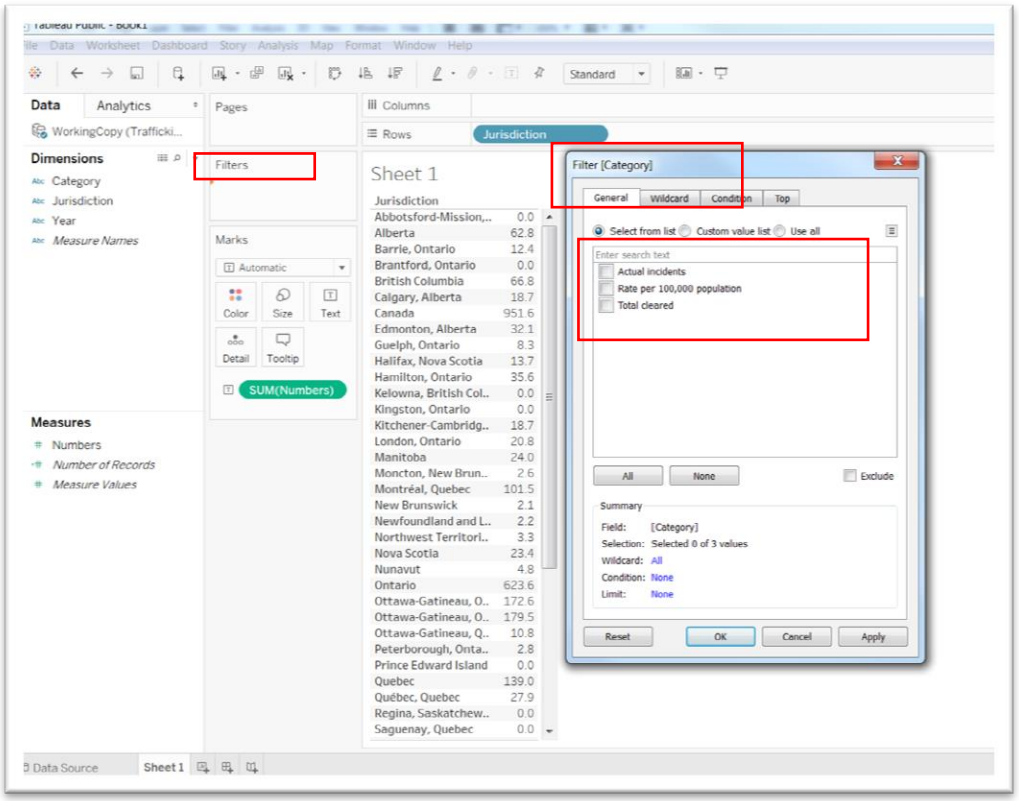
To create the first worksheet, drag [Jurisdiction] into the “Rows” section.



Drag the [Numbers] into the column to the right [Jurisdiction] column.

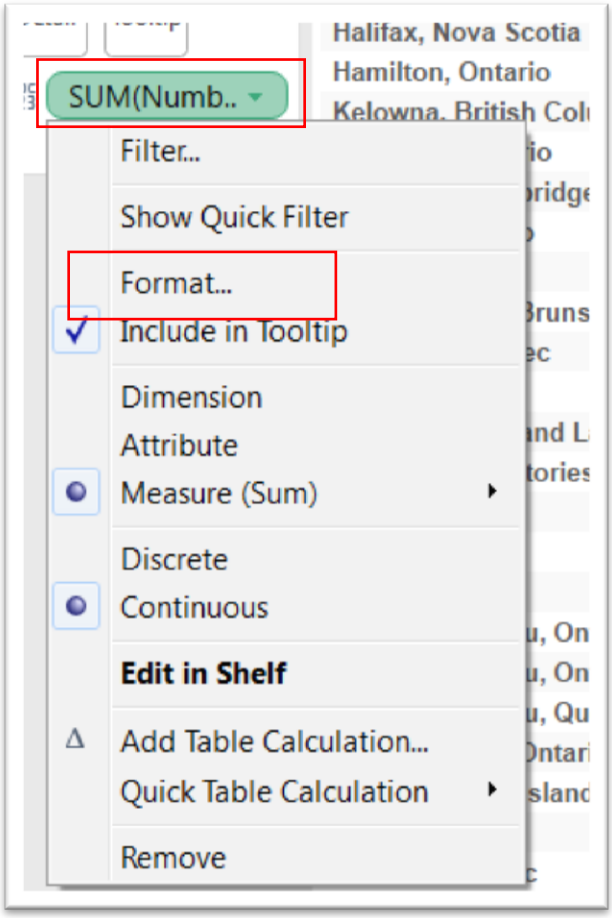


Doing so, also places the [Numbers] into the "Text" icon in the "Marks" section, which will allow us to format and filter. You'll recall that the [Numbers] are for three separate categories: the actual number of offences; the rate; and the number of cases cleared, or that never went to court. Tableau has lumped them all together. In order to make sense, these numbers must be filtered to reflect the value we want for this worksheet. In these case, we're interested in the actual number. So drag the [Category] column into the "Filters" section to its immediate right, which produces a dialogue box.



Select “Actual Incidents”, and then the “Apply” and “OK” tabs.

Much better. The numbers only represent the actual incidents. However, let's get rid of the decimal point by reformatting the numbers. Click on the arrow to the right of the "SUM(Numbers)" tab and then the format option.



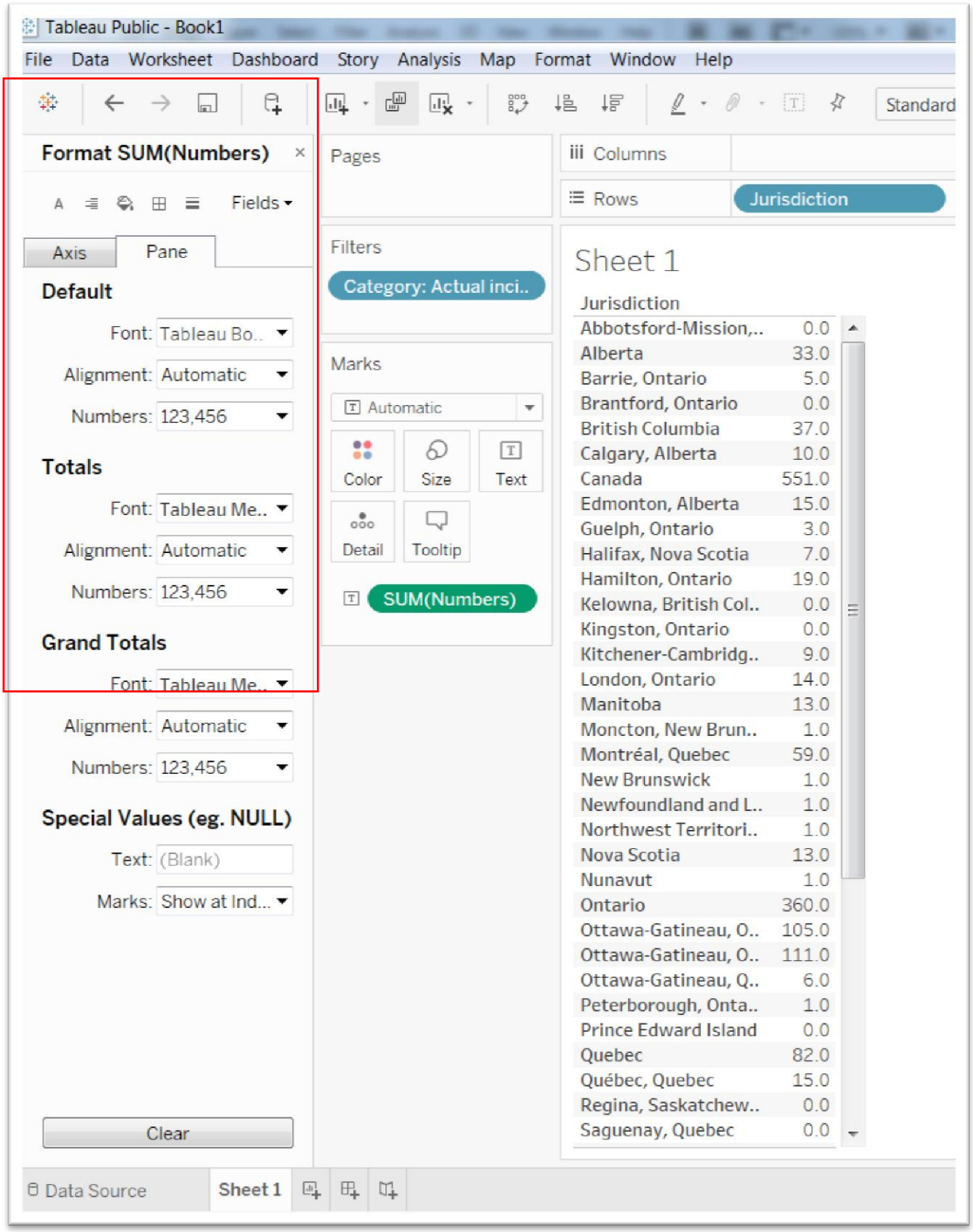
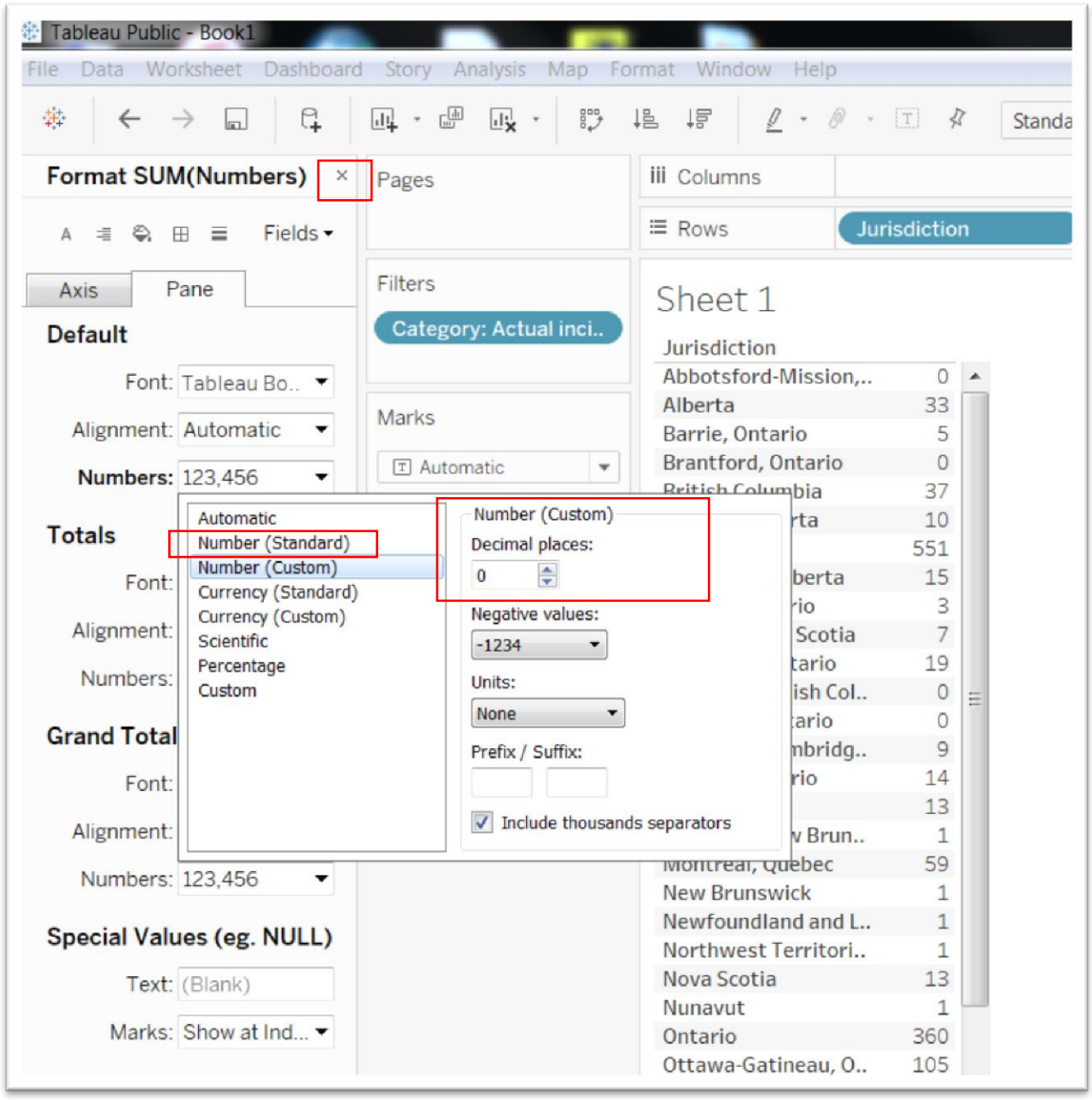
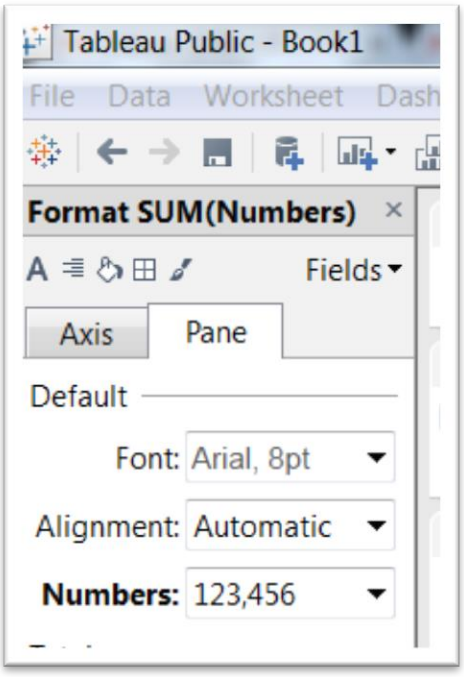


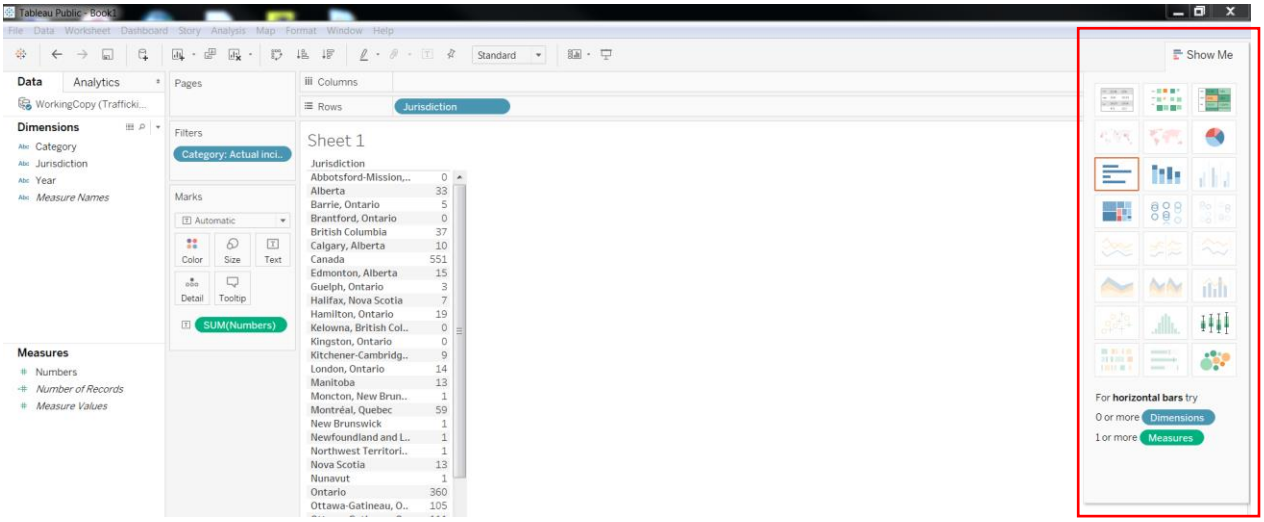
Tableau Public - Book1
File Data Worksheet Dashboard Story Analysis Map Format Window Help
Standard
Format SUM(Numbers)
Fields
Axis
Pane
Default
Font: Tableau Bo..
Alignment: Automatic
Numbers: 123,456
Totals
Font: Tableau Me..
Alignment: Automatic
Numbers: 123,456
Grand Totals
Font: Tableau Me..
Alignment: Automatic
Numbers: 123,456
Special Values (eg. NULL)
Text: (Blank)
Marks: Show at Ind...
Clear
Pages
Columns
Rows
Jurisdiction
Filters
Category: Actual inci..
Marks
Automatic
Color
Size
Text
Detail
Tooltip
SUM(Numbers)
Sheet 1
Jurisdiction
Abbotsford-Mission,.. 0.0
Alberta 33.0
Barrie, Ontario 5.0
Brantford, Ontario 0.0
British Columbia 37.0
Calgary, Alberta 10.0
Canada 551.0
Edmonton, Alberta 15.0
Guelph, Ontario 3.0
Halifax, Nova Scotia 7.0
Hamilton, Ontario 19.0
Kelowna, British Col.. 0.0
Kingston, Ontario 0.0
Kitchener-Cambridg.. 9.0
London, Ontario 14.0
Manitoba 13.0
Moncton, New Brun.. 1.0
Montréal, Quebec 59.0
New Brunswick 1.0
Newfoundland and L.. 1.0
Northwest Territori.. 1.0
Nova Scotia 13.0
Nunavut 1.0
Ontario 360.0
Ottawa-Gatineau, O.. 105.0
Ottawa-Gatineau, O.. 111.0
Ottawa-Gatineau, Q.. 6.0
Peterborough, Onta.. 1.0
Prince Edward Island 0.0
Quebec 82.0
Québec, Quebec 15.0
Regina, Saskatchew.. 0.0
Saguenay, Quebec 0.0
Data Source
Sheet 1

You'll find a formatting menu on the left-hand side.

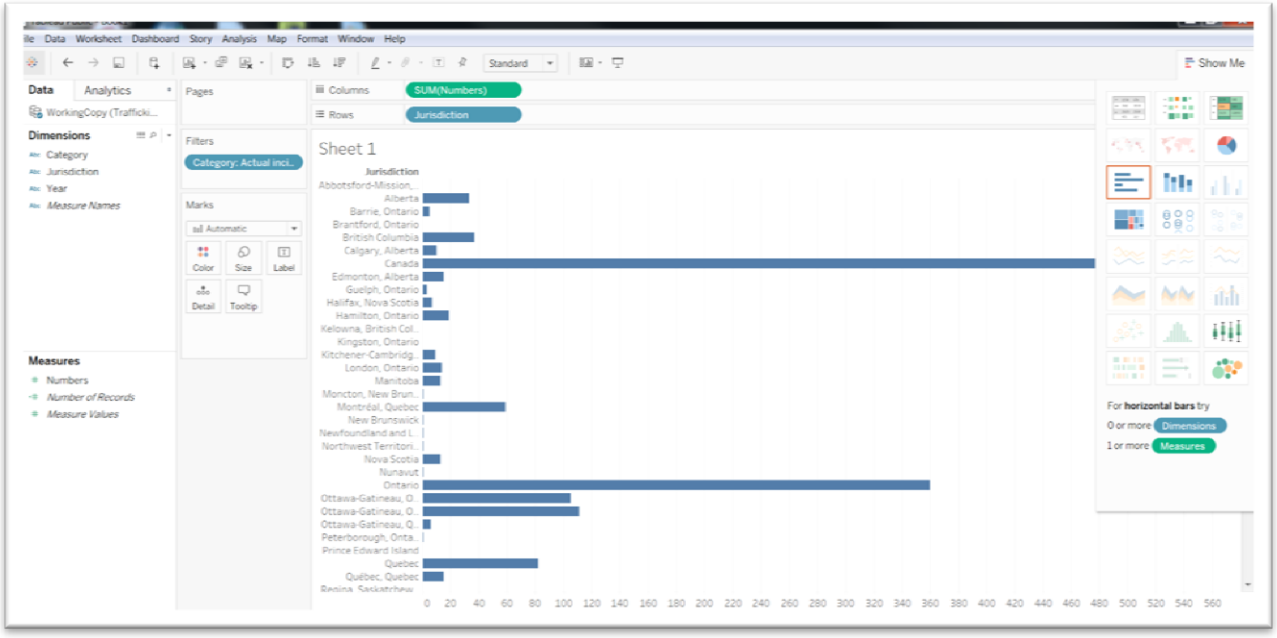


Once you've made the selections, close the menu by clicking on the "X" at the top right corner.

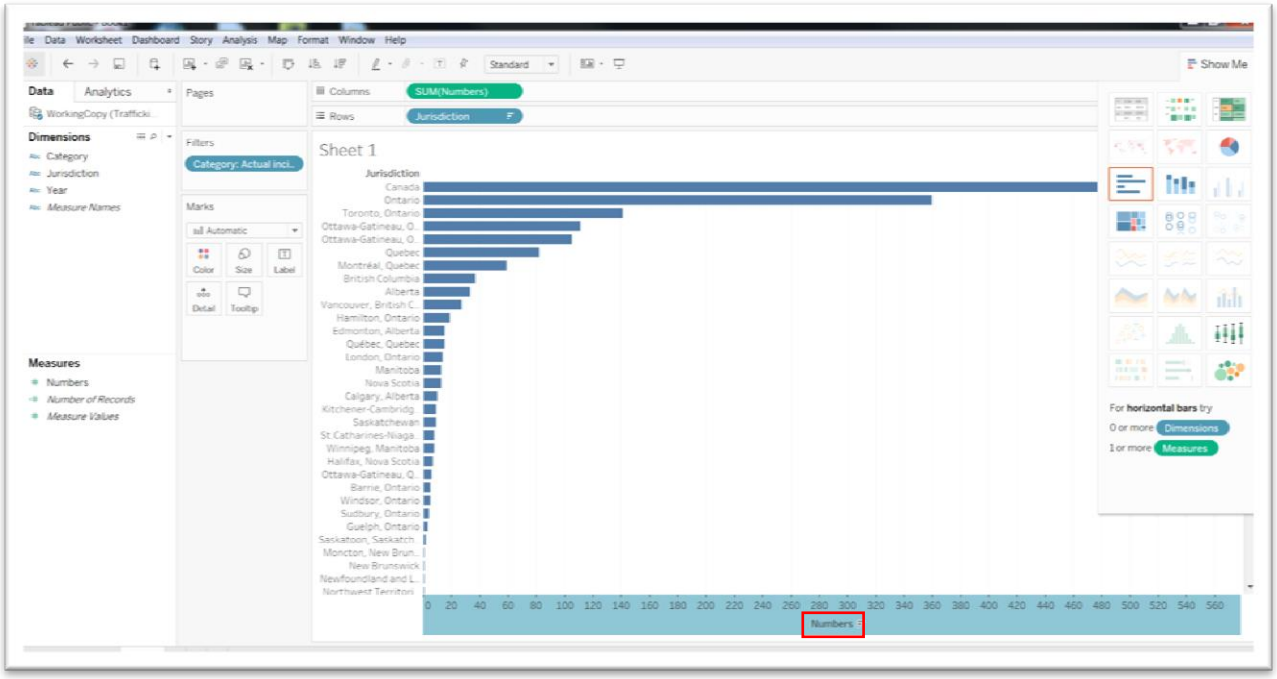




You'll also notice a "Show Me" box on the far right side of the screen. It contains several visualization types that go from being greyed-out to coloured. The latter category means they can be selected for use. By selecting one, you will automatically create that visualization. This "Show Me" feature is a great way to start understanding how the Tableau interface works. Let's select the horizontal bar graph.



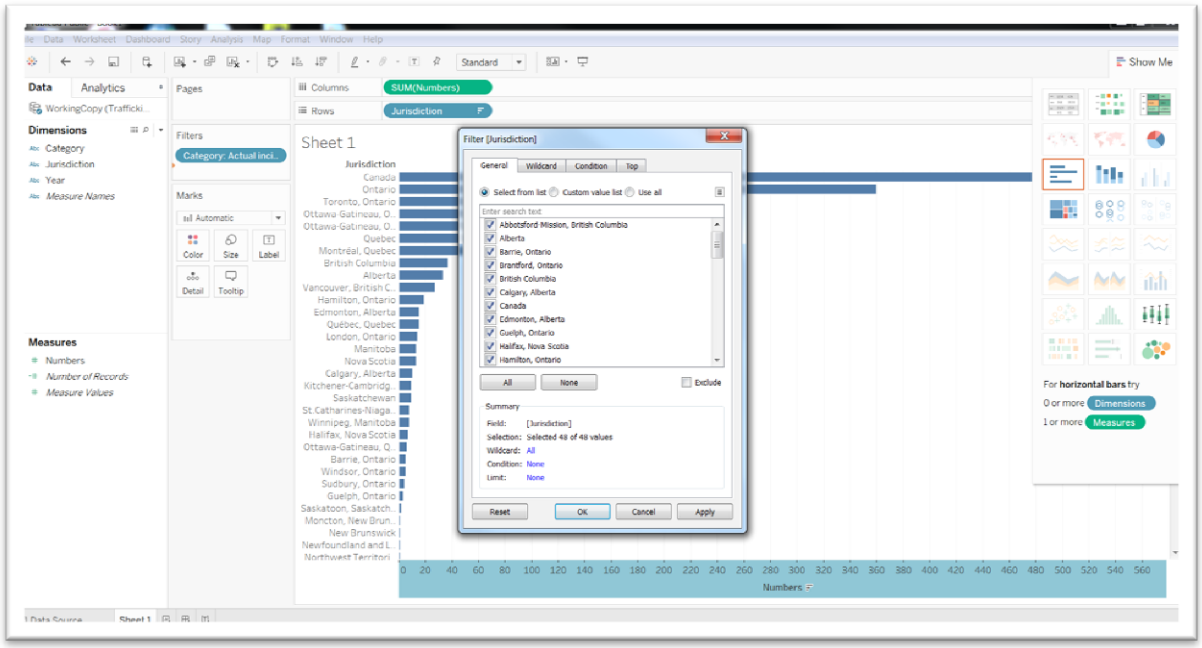
The numbers are on the X-axis. To sort from largest to smallest, hover your cursor over [Numbers] which produces a small, sorting icon to the right that allows the values to go from largest to smallest and vice-versa. Let's go largest to smallest.



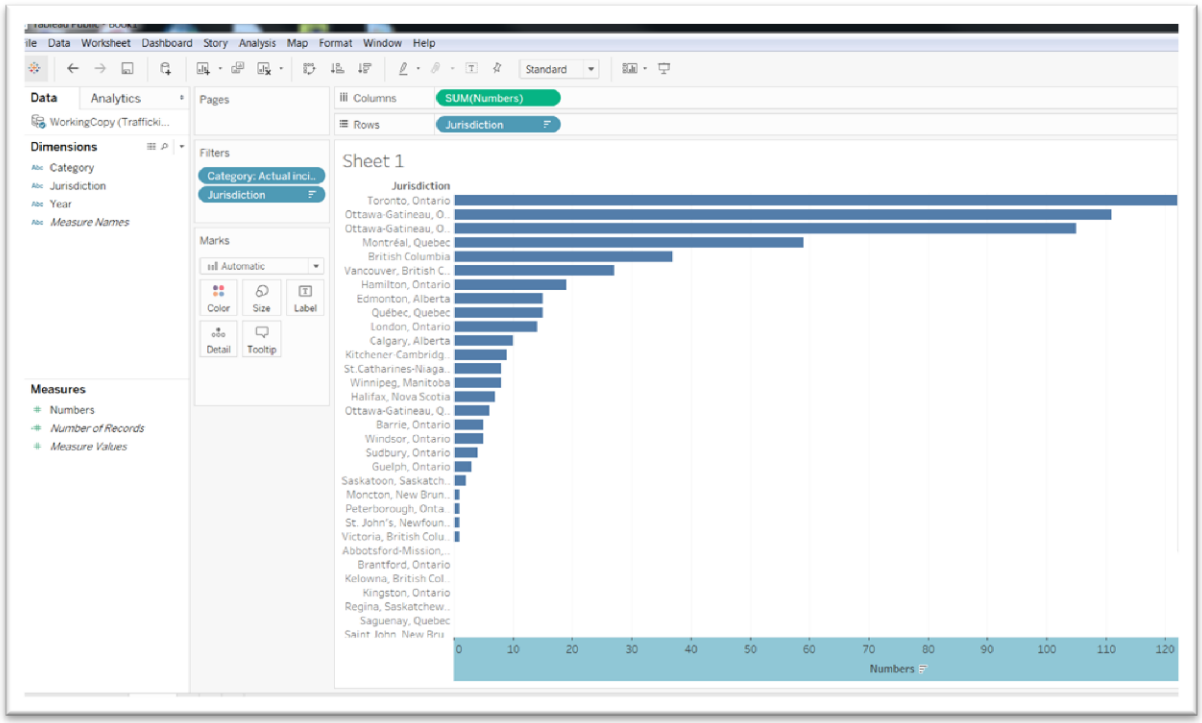
Canada has the highest numbers, followed by Ontario. Canada is actually a compilation of provincial, territorial and municipal jurisdictions. So it should be removed from the table, along with the provinces, leaving us with just cities.

To do this, we'll have to de-select Canada and the provinces and territories.

Drag the [Jurisdiction] column in the "Dimensions" section into the "Filters" category, just like we did for the "Actual Incidents."

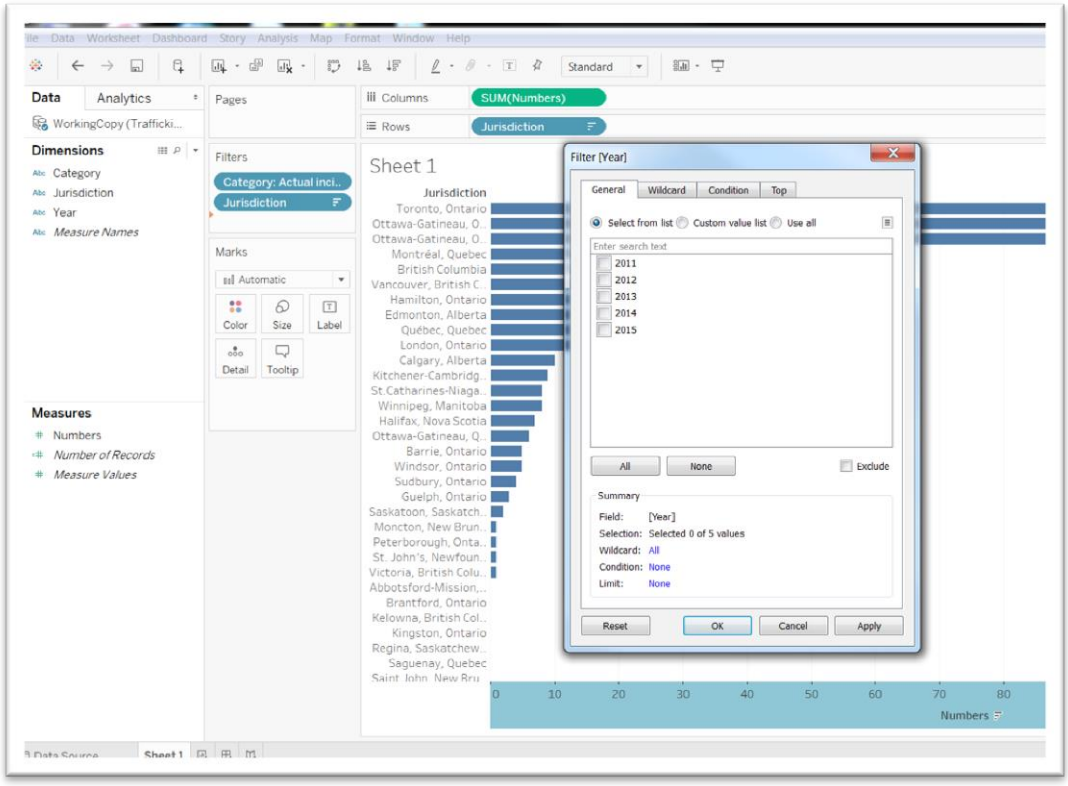


De-select Canada and the provinces and territories from the list, and then click the "Apply" and "OK" tabs.

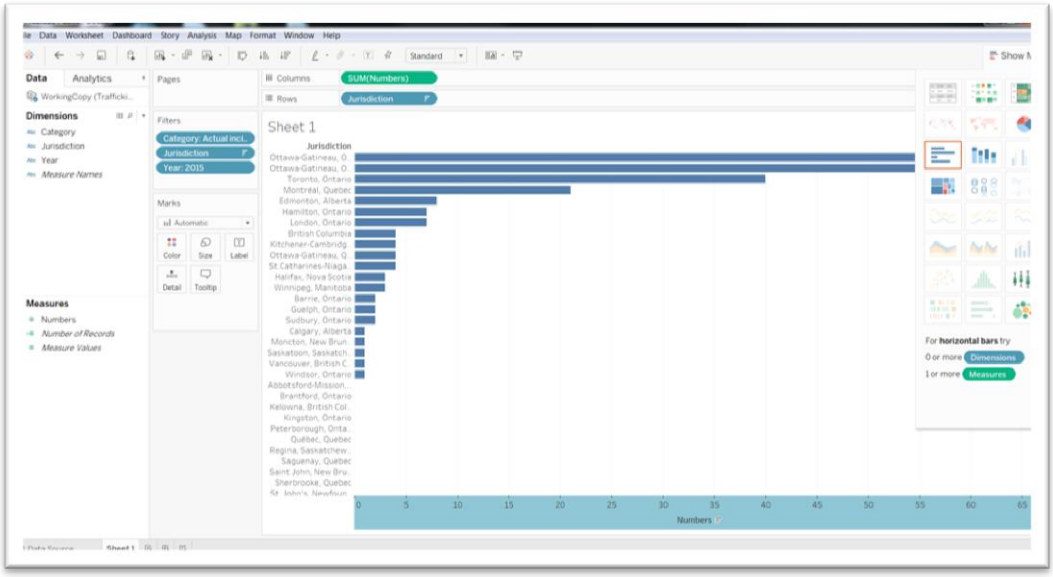


Much better. Now before we rename the worksheet and move to the next step, let's limit the year to the most recent, 2015.

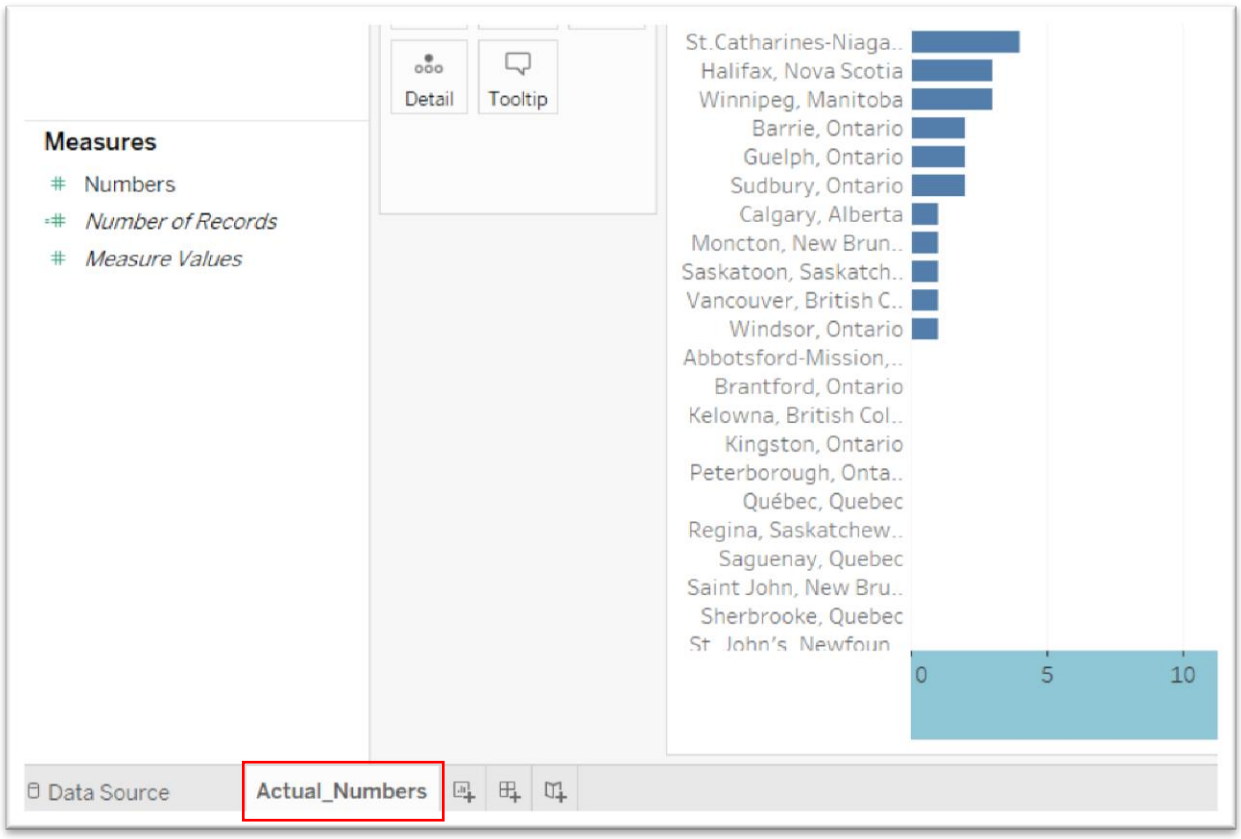
Drag the [Year] column from the "Dimensions" category into the filter, which produces a dialogue box.



Select 2015.



Now click on the Worksheet and rename it "Actual Numbers", and then the select tab to the right to open a new worksheet.



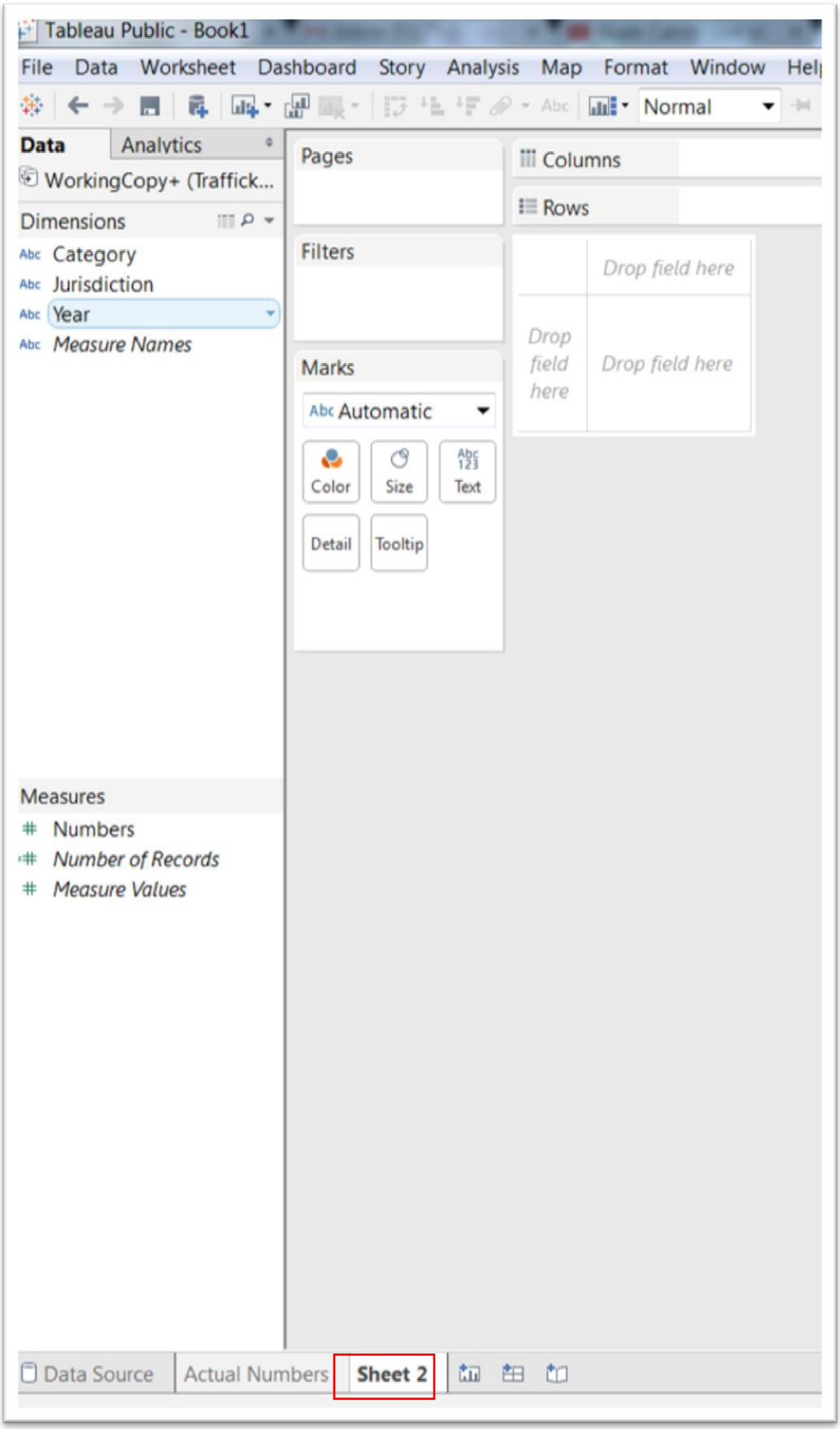
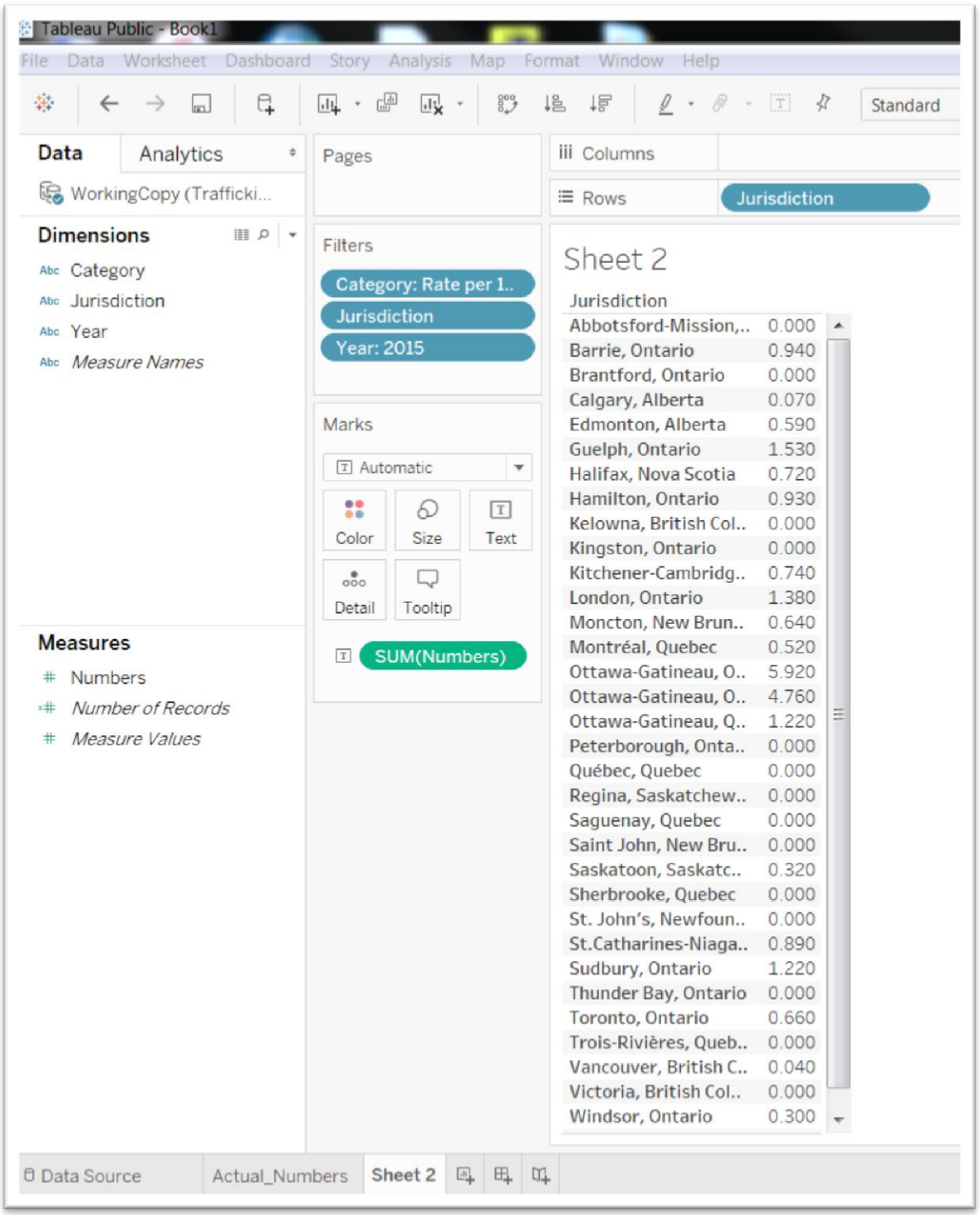
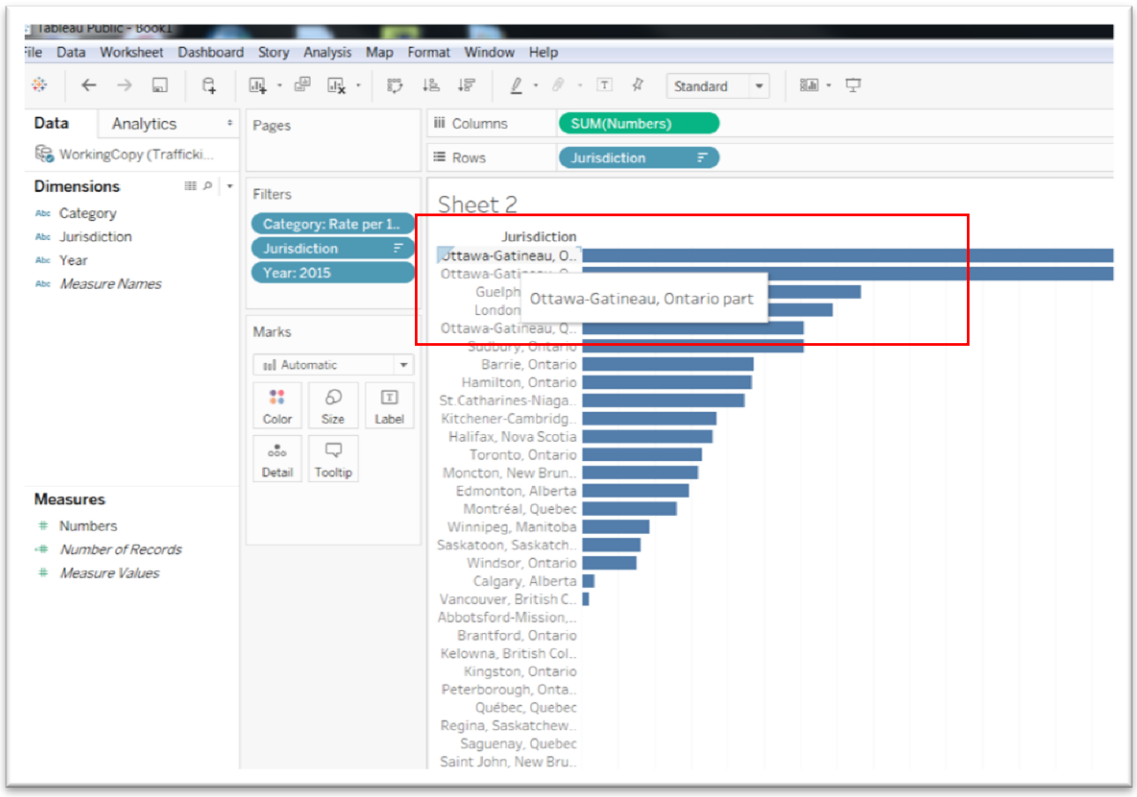


Tableau Public - Book1
File Data Worksheet Dashboard Story Analysis Map Format Window Help
Normal
Data
Analytics
WorkingCopy+ (Traffick...
Dimensions
Abc Category
Abc Jurisdiction
Abc Year
Abc Measure Names
Measures
Numbers
Number of Records
Measure Values
Pages
Filters
Marks
Abc Automatic
Color
Size
Abc 123 Text
Detail
Tooltip
Columns
Rows
Drop field here
Drop field here
Drop field here
Data Source
Actual Numbers
Sheet 2

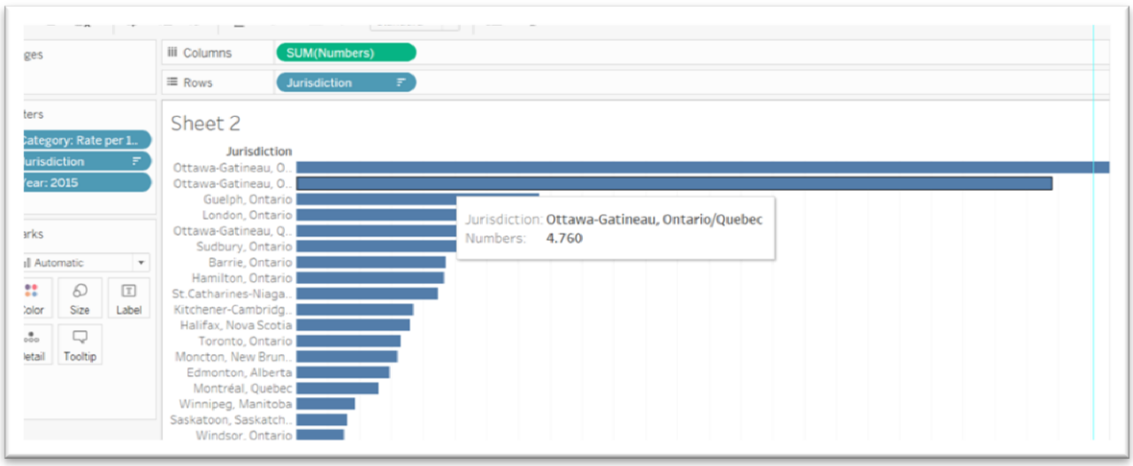
Repeat the same process that we used to get the numbers into the first worksheet, but this time, filter the [Category] for "Rate". However, when reformatting the numbers, leave decimal places. Decimals matter when working with rates.



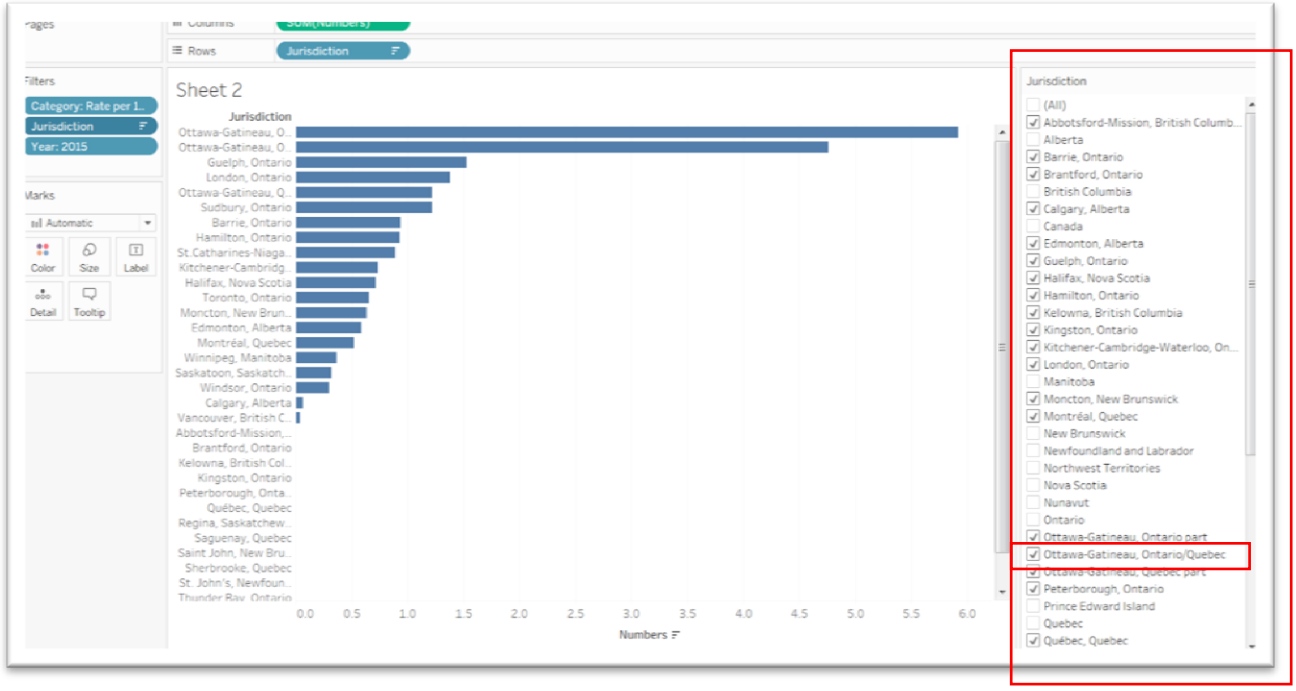
Select a horizontal bar chart from the "Show Me" dialogue box, and sort the number tab below the X-axis in descending order.



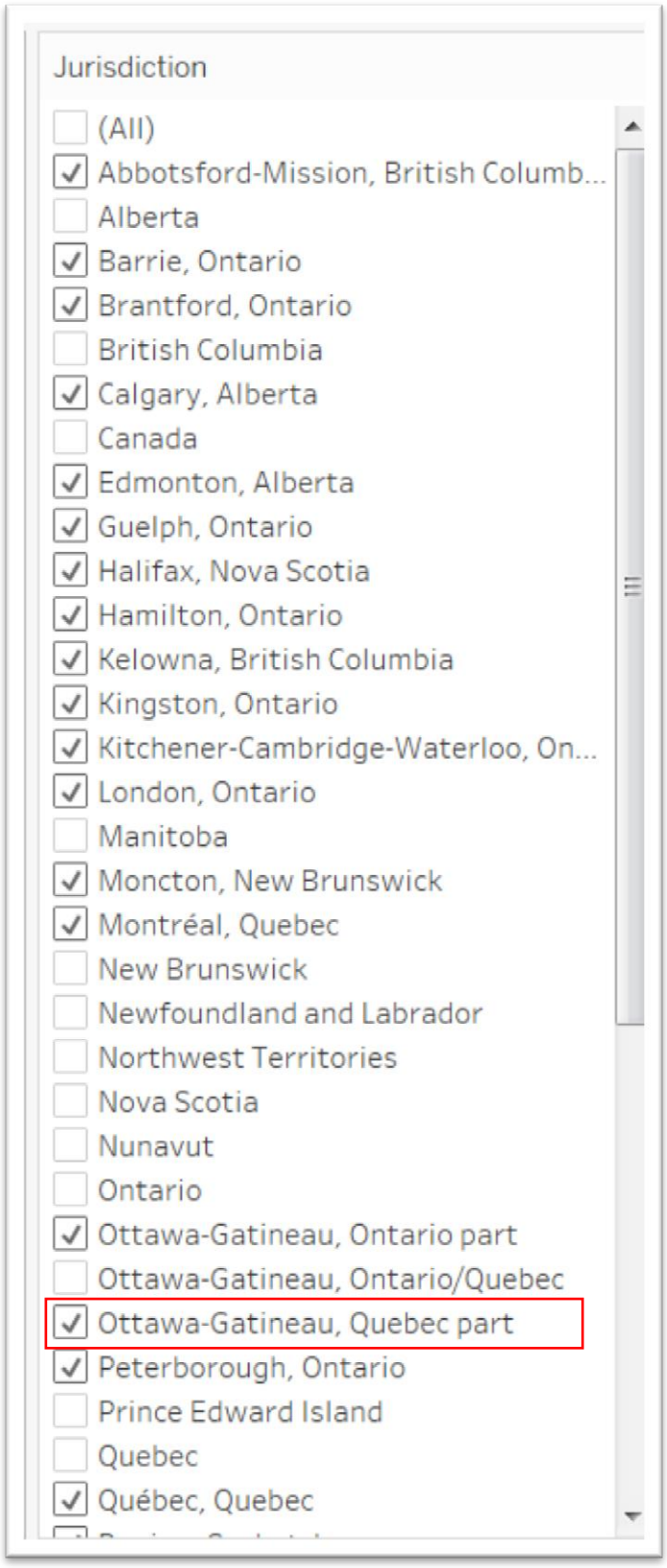
Interestingly, the Ottawa-Gatineau contains areas on the Ontario side of the Ottawa River. Statistics Canada also groups the Ontario and Quebec side as one jurisdiction, Ottawa-Gatineau. So to make things easier, let's use the filter to de-select "Ottawa-Gatineau, Ontario/Quebec".



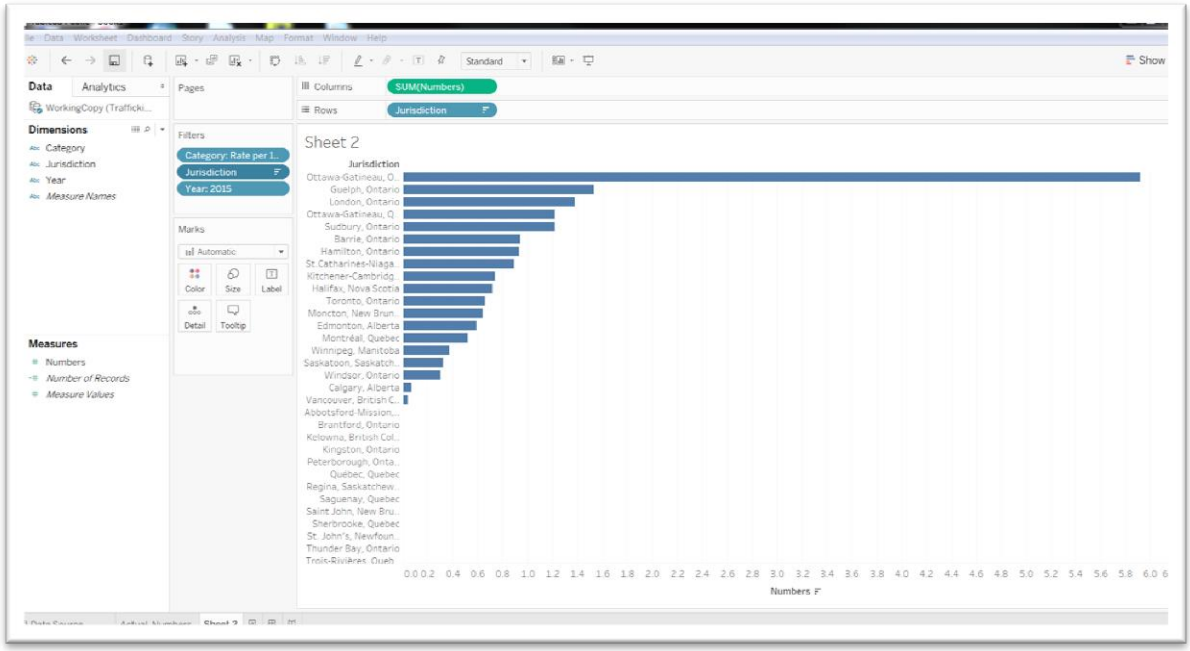
To filter the combined Ottawa-Gatineau category, hover your cursor over the [Jurisdiction] tab on the left, click on the arrow to produce a drop-down menu, and select the "Show filter" option, which you can see on the far right.



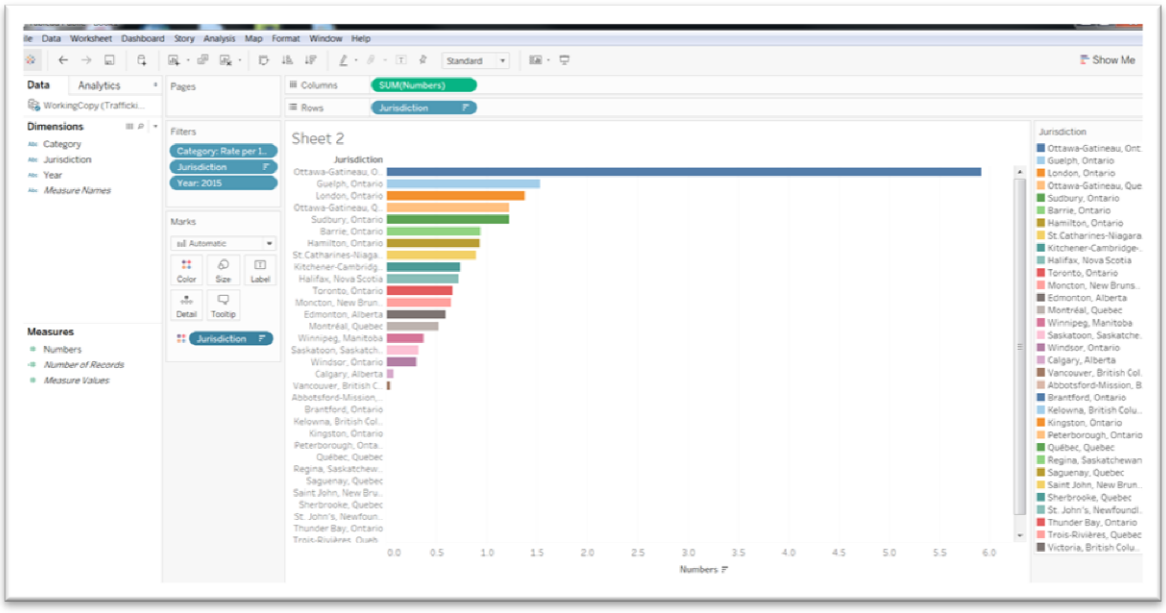
(NOTE: To make it easier to see the filter, we clicked on the "Show Me" dialogue box at the top to make it disappear. To make it reappear, click on the icon once again when you're finished filtering.) De-select the category with the two jurisdictions.


Jurisdiction
(All)
Abbotsford-Mission, British Columb...
Alberta
Barrie, Ontario
Brantford, Ontario
British Columbia
Calgary, Alberta
Canada
Edmonton, Alberta
Guelph, Ontario
Halifax, Nova Scotia
Hamilton, Ontario
Kelowna, British Columbia
Kingston, Ontario
Kitchener-Cambridge-Waterloo, On...
London, Ontario
Manitoba
Moncton, New Brunswick
Montréal, Quebec
New Brunswick
Newfoundland and Labrador
Northwest Territories
Nova Scotia
Nunavut
Ontario
Ottawa-Gatineau, Ontario part
Ottawa-Gatineau, Ontario/Quebec
Ottawa-Gatineau, Quebec part
Peterborough, Ontario
Prince Edward Island
Quebec
Québec, Quebec

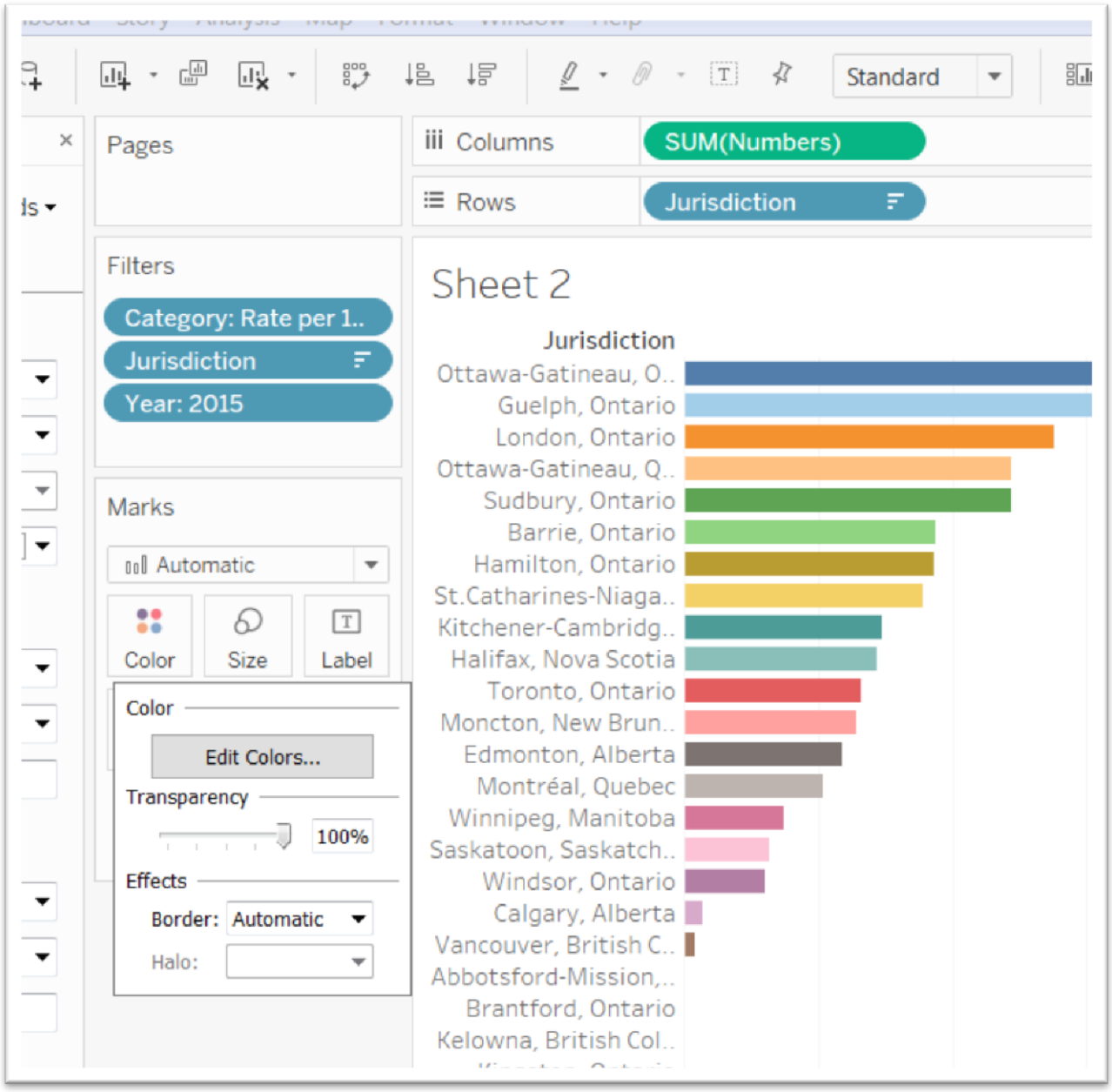
Return to the "Jurisdiction" tab in the short-cut menu, and de-select the "Show Filter" option.



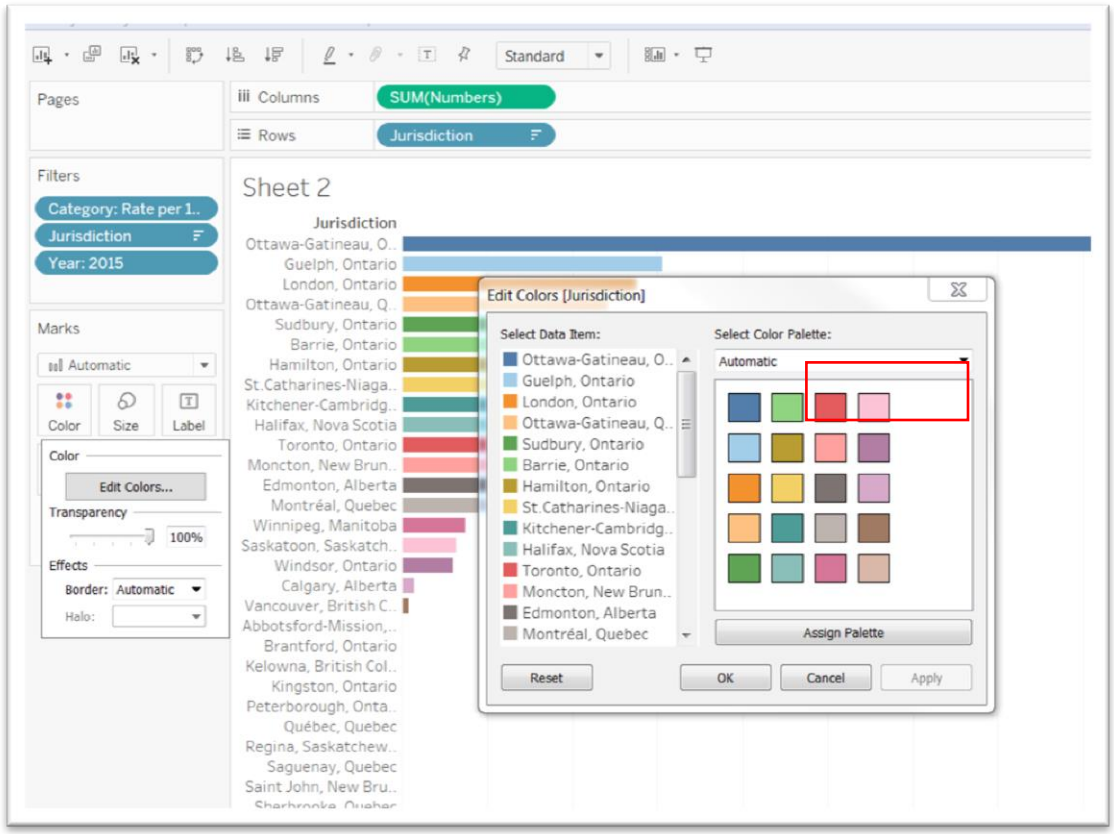
Now we can see that Ottawa-Gatineau clearly had the highest rate in 2015, an interesting finding, given that it's only the country's fourth-largest city. You might expect metropolitan areas like Toronto or Montreal to have higher rates, given their larger populations. Now you can select the "Show Me" tab. Let's do one more thing before naming the worksheet: give the chart a different colour. Drag the [Jurisdiction] tab into the "color" box in the "Marks" section.

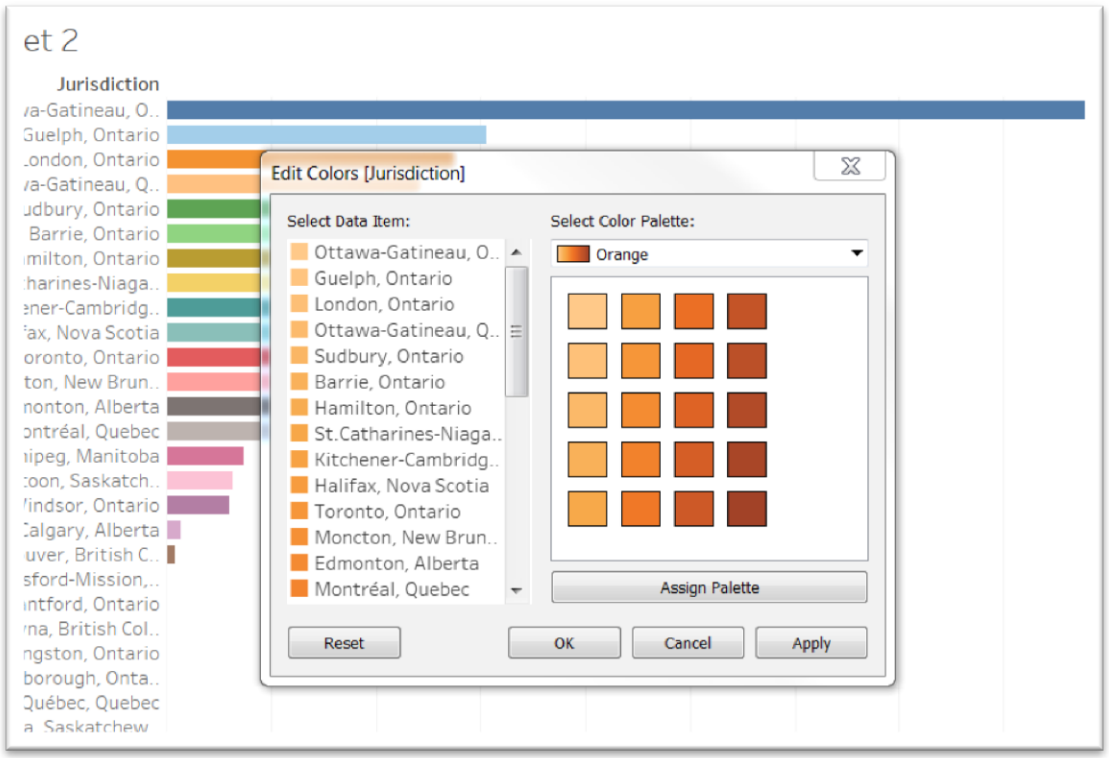


You can leave it multi-colour, or provide one hue for all jurisdictions.

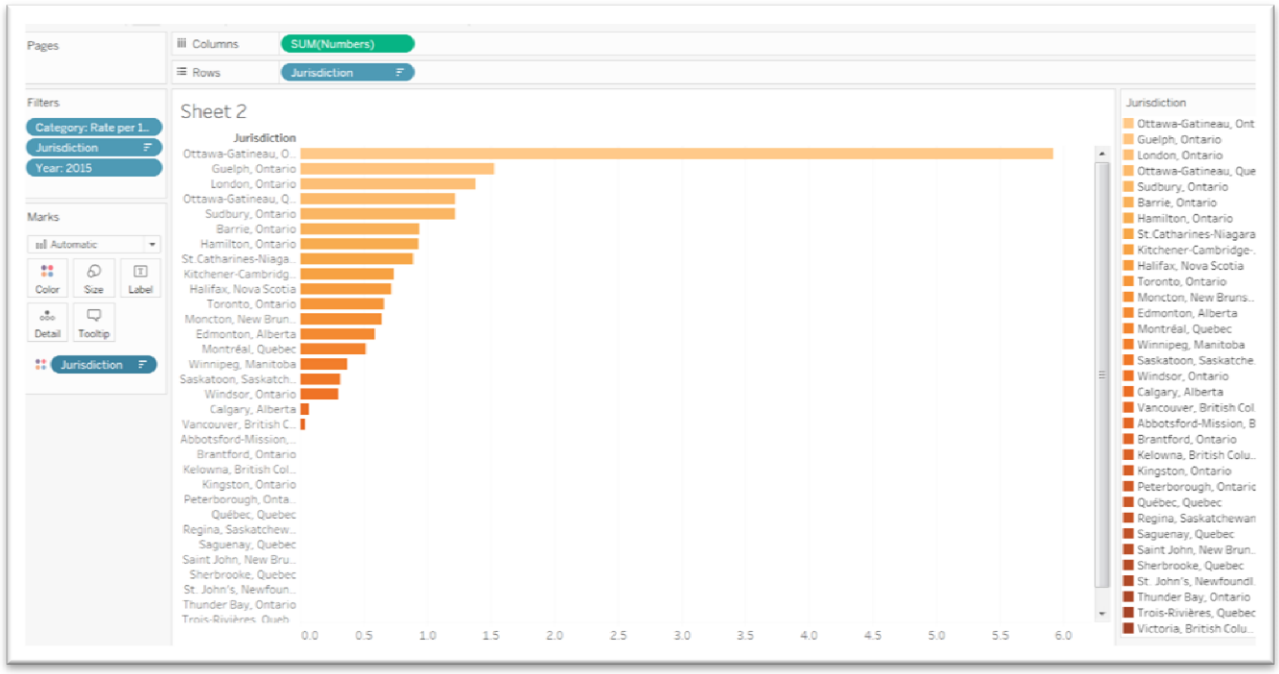


Choose the "Edit Colors" tab to obtain a dialogue box, and click the downward arrow to the right of the rectangle under the "Select Color Palette" label. Choose a different colour, and the "Assign Palette" tab.

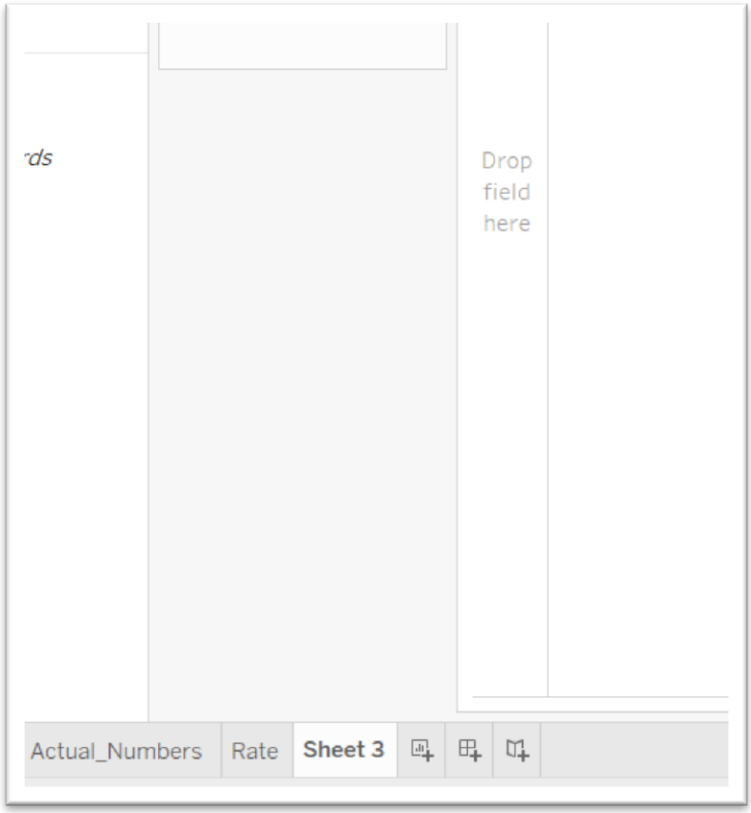

Standard
Pages
Columns
SUM(Numbers)
Rows
Jurisdiction
Filters
Category: Rate per 1..
Jurisdiction
Year: 2015
Marks
Automatic
Color
Size
Label
Color
Edit Colors...
Transparency
100%
Effects
Border: Automatic
Halo:
Sheet 2
Jurisdiction
Ottawa-Gatineau, O..
Guelph, Ontario
London, Ontario
Ottawa-Gatineau, Q..
Sudbury, Ontario
Barrie, Ontario
Hamilton, Ontario
St.Catharines-Niaga..
Kitchener-Cambridg..
Halifax, Nova Scotia
Toronto, Ontario
Moncton, New Brun..
Edmonton, Alberta
Montréal, Quebec
Winnipeg, Manitoba
Saskatoon, Saskatch..
Windsor, Ontario
Calgary, Alberta
Vancouver, British C..
Abbotsford-Mission,..
Brantford, Ontario
Kelowna, British Col..
Kingston, Ontario
Peterborough, Onta..
Québec, Quebec
Regina, Saskatchew..
Saguenay, Quebec
Saint John, New Bru..
Edit Colors [Jurisdiction]
Select Data Item:
Select Color Palette:
Automatic
Assign Palette
Reset
OK
Cancel
Apply


et 2
Jurisdiction
Edit Colors [Jurisdiction]
Select Data Item:
Select Color Palette:
Orange
Ottawa-Gatineau, O..
Guelph, Ontario
London, Ontario
Ottawa-Gatineau, Q..
Sudbury, Ontario
Barrie, Ontario
Hamilton, Ontario
St.Catharines-Niaga..
Kitchener-Cambridg..
Halifax, Nova Scotia
Toronto, Ontario
Moncton, New Brun..
Edmonton, Alberta
Montréal, Quebec
Assign Palette
Reset
OK
Cancel
Apply

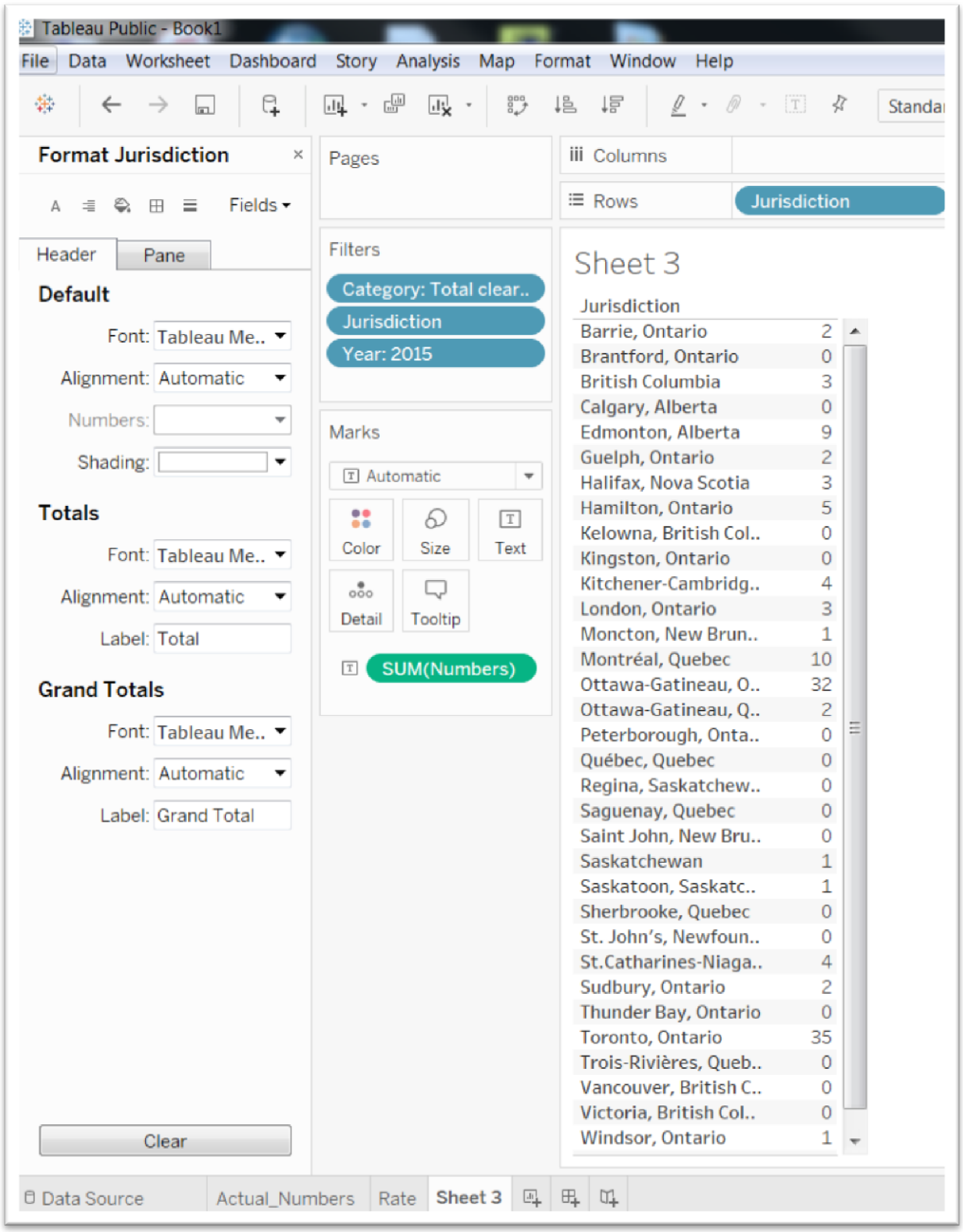
Select the “Apply” and “OK” tabs.



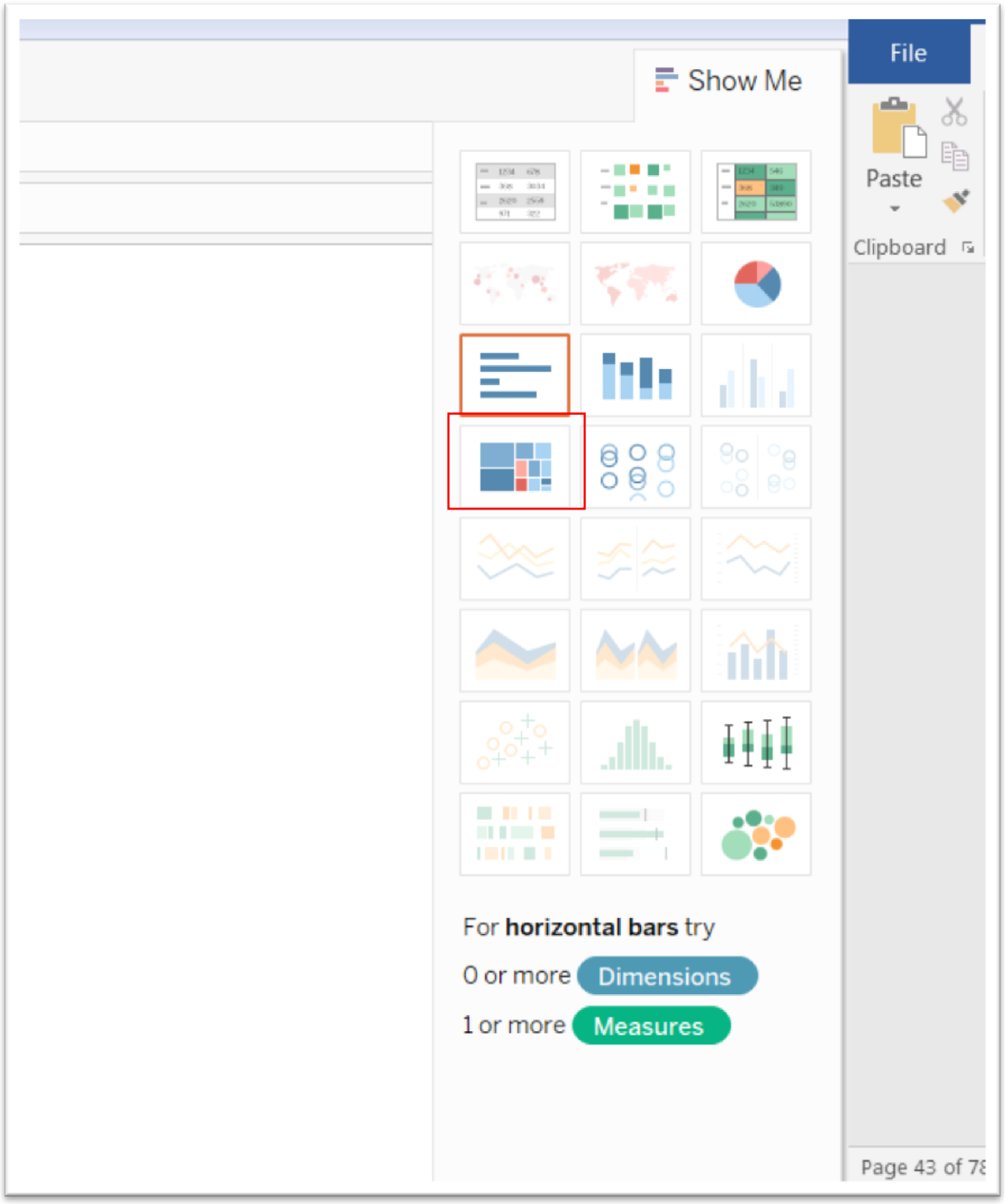
If you’re happy with the result, rename the worksheet, “Rate”. And create a third worksheet.



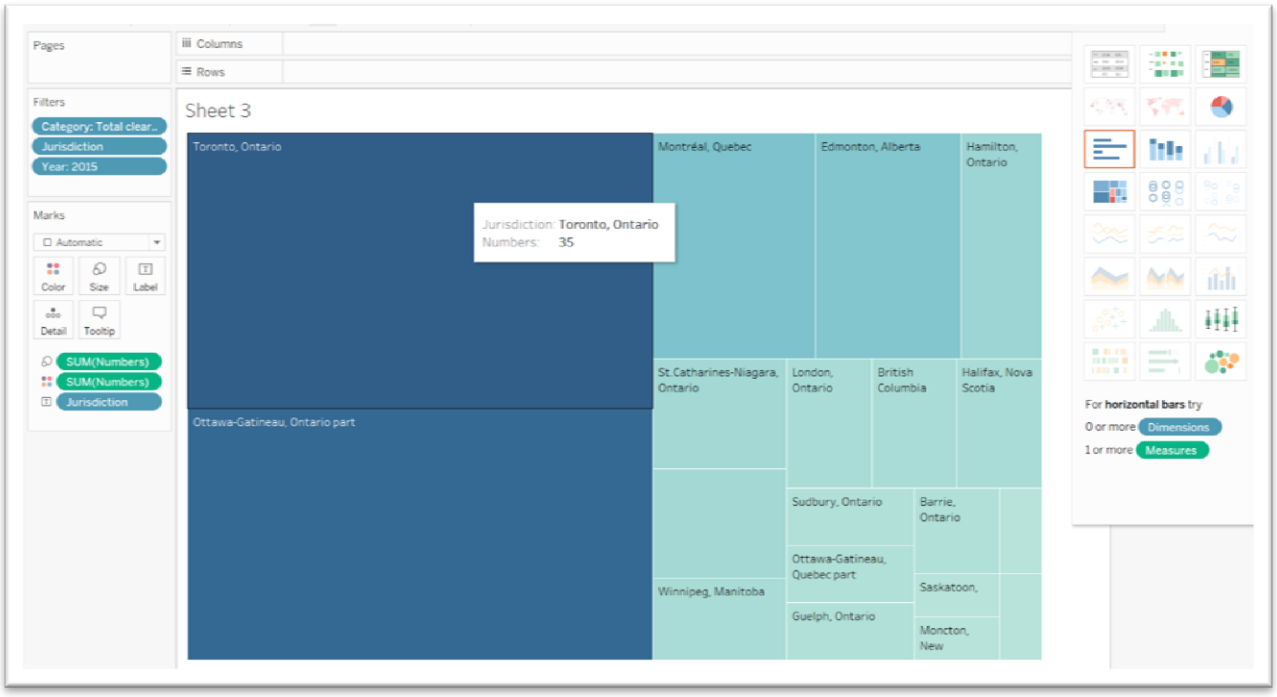
For this worksheet, we can show the "Total cleared". To obtain the chart, repeat the steps we used to create the first two.



For this we can choose a different visualization.



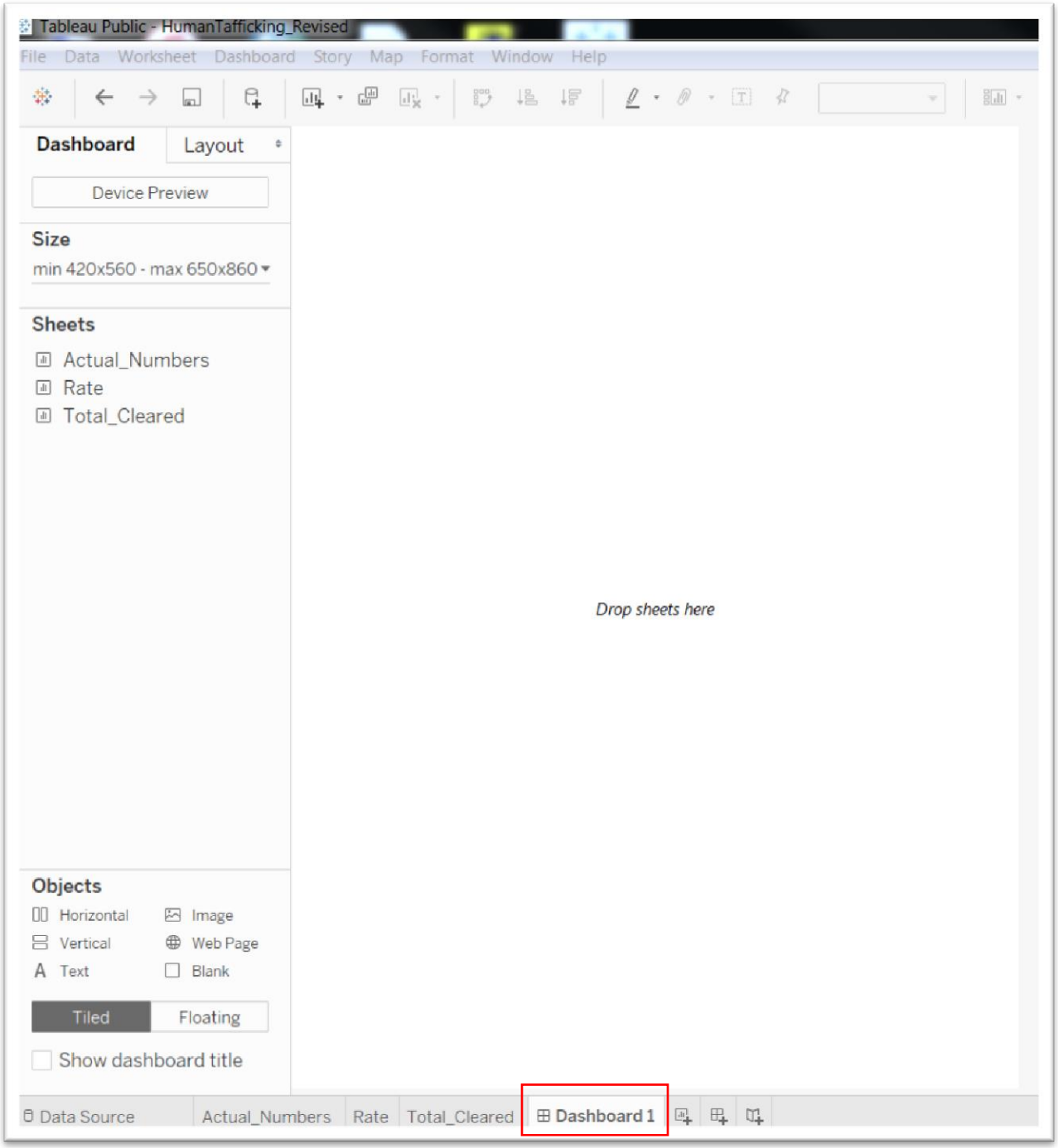
Let's try the one highlighted by the red triangle in the "Show Me" box.



Unlike the previous two visualizations, this one uses different sized, coloured squares to show the values. Toronto had the largest number of clearances, followed by Ottawa-Gatineau. Name this worksheet "Total_Cleared".

Now it's time to use a dashboard to show the three visualizations we've made.

Right-click on the tab to the right of "Total_Cleared" and select the "New Dashboard" option.



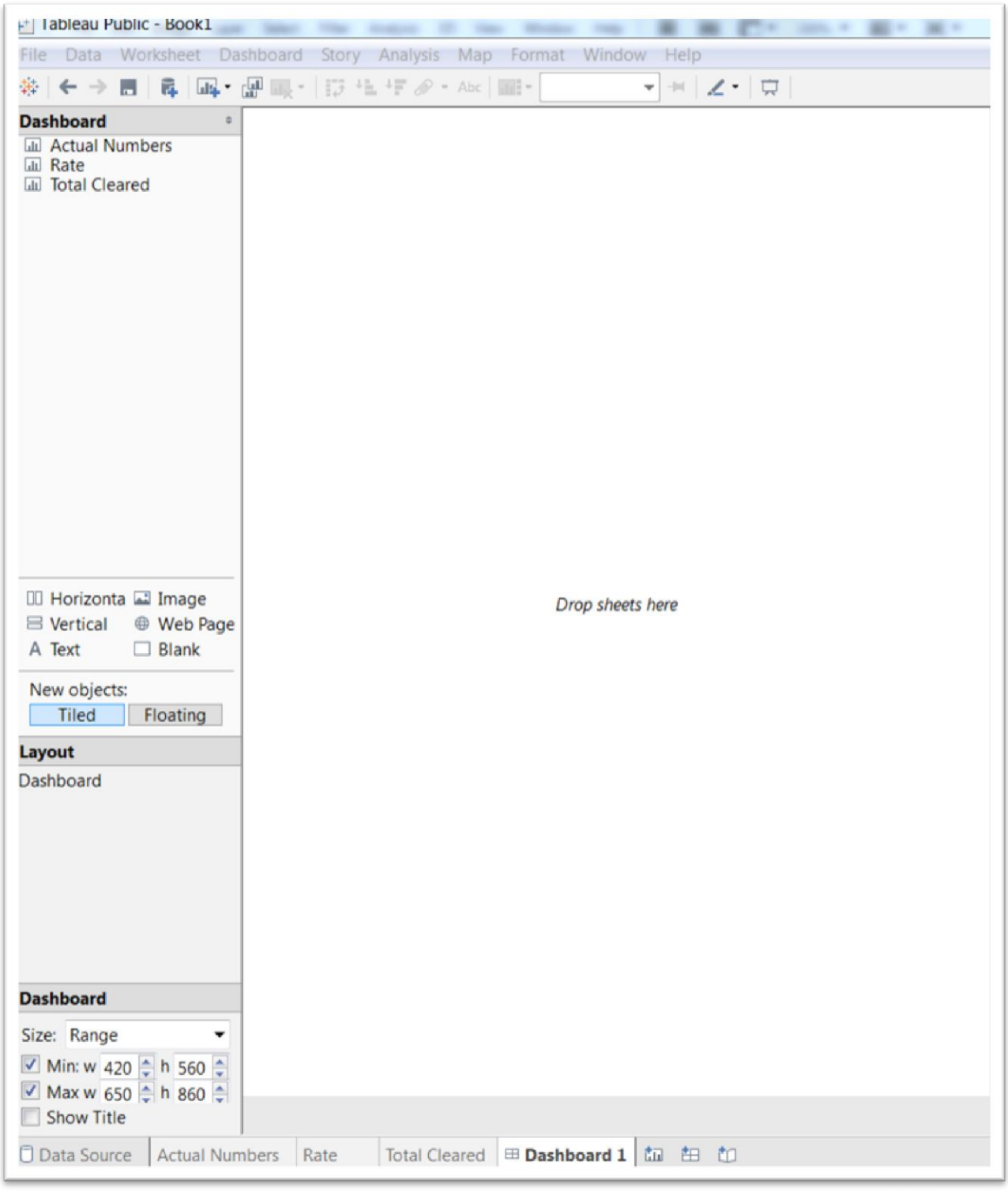
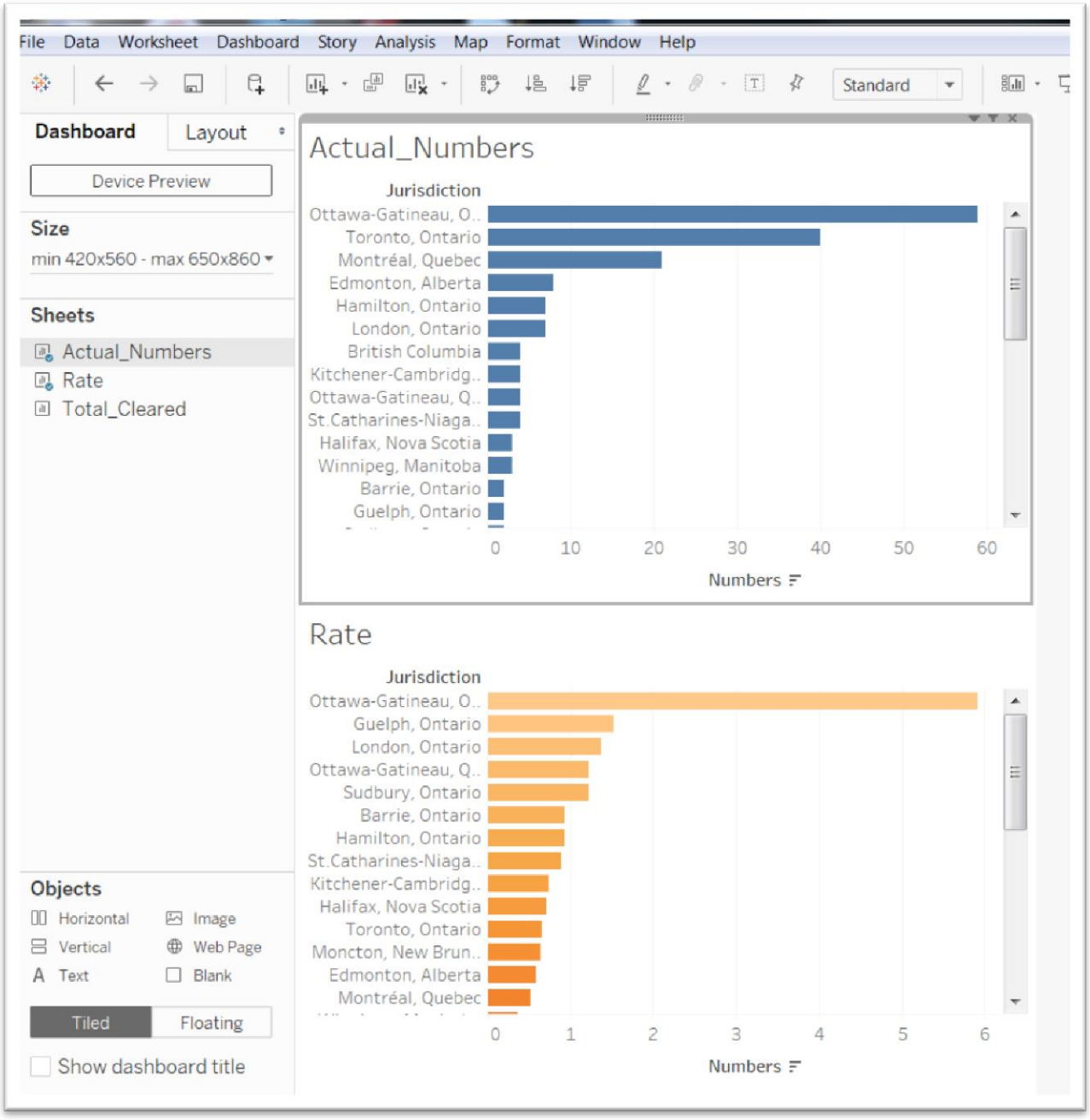
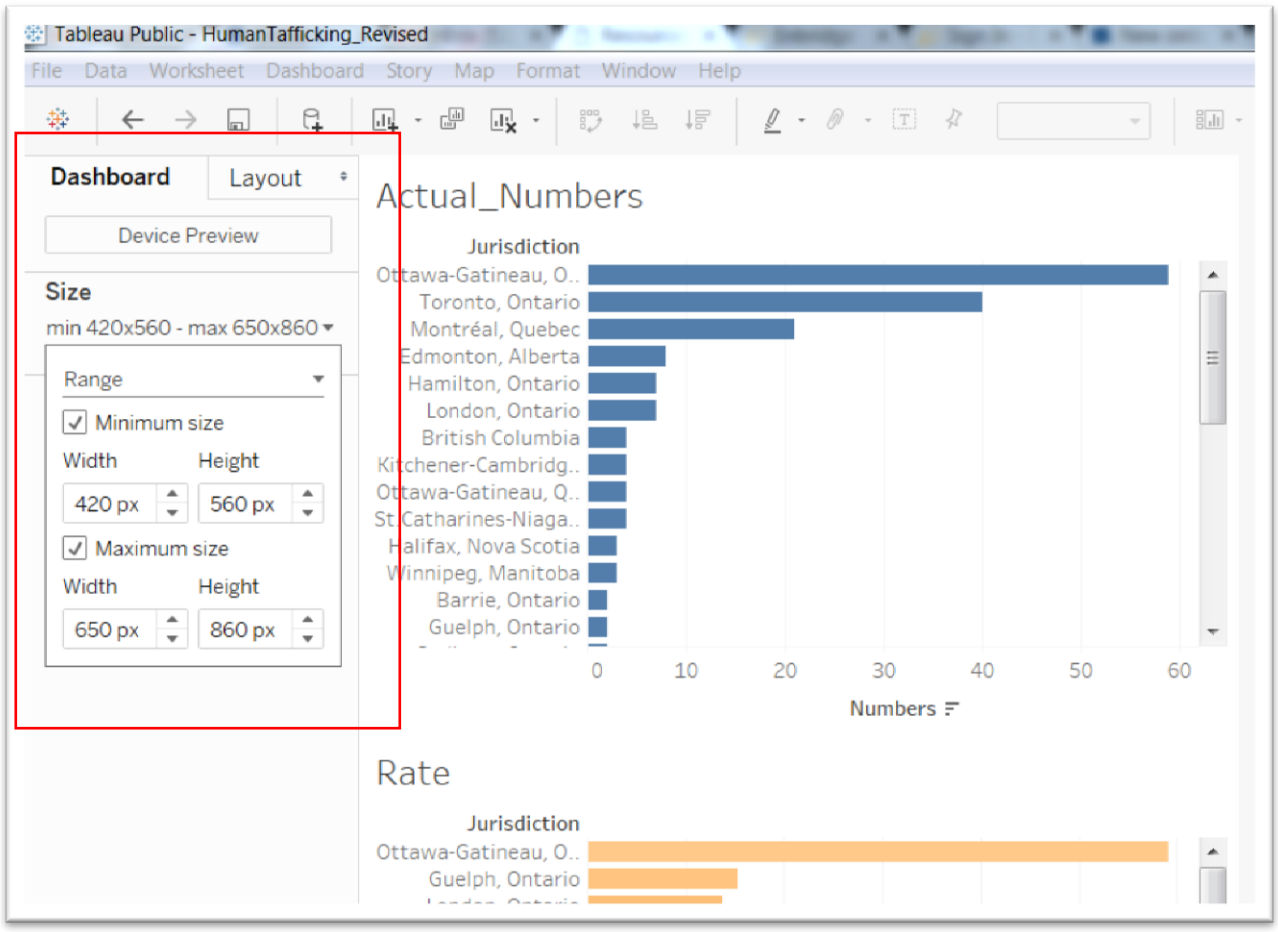


Tableau Public - Book1
File Data Worksheet Dashboard Story Analysis Map Format Window Help
Dashboard
Actual Numbers
Rate
Total Cleared
Horizonta
Vertical
Text
Image
Web Page
Blank
New objects:
Tiled
Floating
Layout
Dashboard
Dashboard
Size: Range
Min: w 420 h 560
Max w 650 h 860
Show Title
Drop sheets here
Data Source
Actual Numbers
Rate
Total Cleared
Dashboard 1

The dashboard accommodates the charts we've created, which you can see on the left-hand side. You can merely drag and drop them onto the canvas to create the visualization you'll eventually upload to your blog. Drag and drop "Actual Numbers" first, and then Rate, to create a dashboard that looks like this.

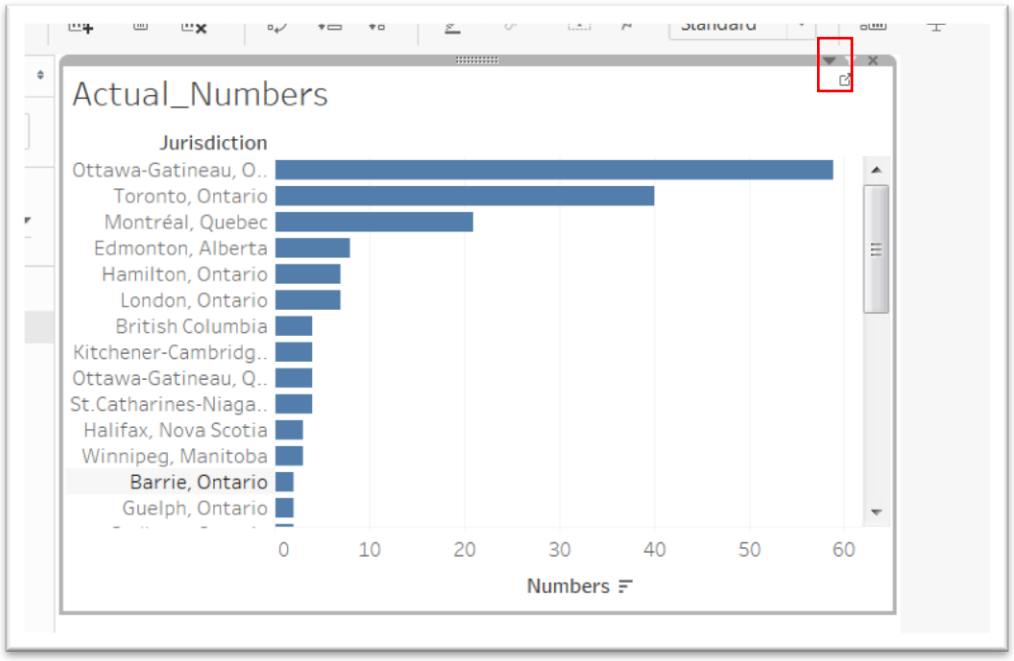


You can alter the size of the visualization, depending on the platform you intend to use.

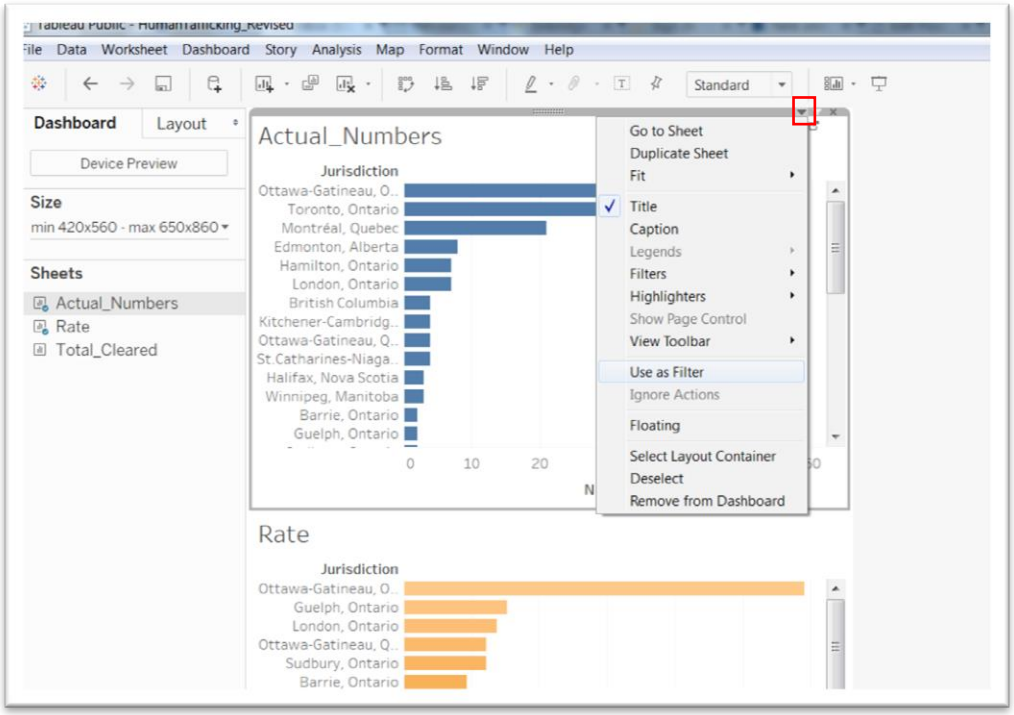


You can also leave or remove the legends from the dashboard. This is where the visualization's power comes into play, its ability to convey lots of information at once. We can use the first chart as a filter for the second. That is, clicking on Ottawa-Gatineau will produce the corresponding rate in the chart below. Clicking on the

"Actual_Numbers" chart again resets the view.



To make "Actual_Numbers" the filter for the second chart, click anywhere inside the chart to provide a grey line at the top with a funnel symbol to the far right. You can also accomplish the same goal by clicking on the funnel icon to the right of the downward arrow.



Clicking Ottawa-Gatineau produces the actual number of charges in the first chart, and the corresponding rate in the second chart. To return to the full view, click inside the "Actual_Numbers" chart.

Now let's give our dashboard a title. To do this, click on the box to the right of the "Show dashboard title" under the "Objects" section on the left-hand side.

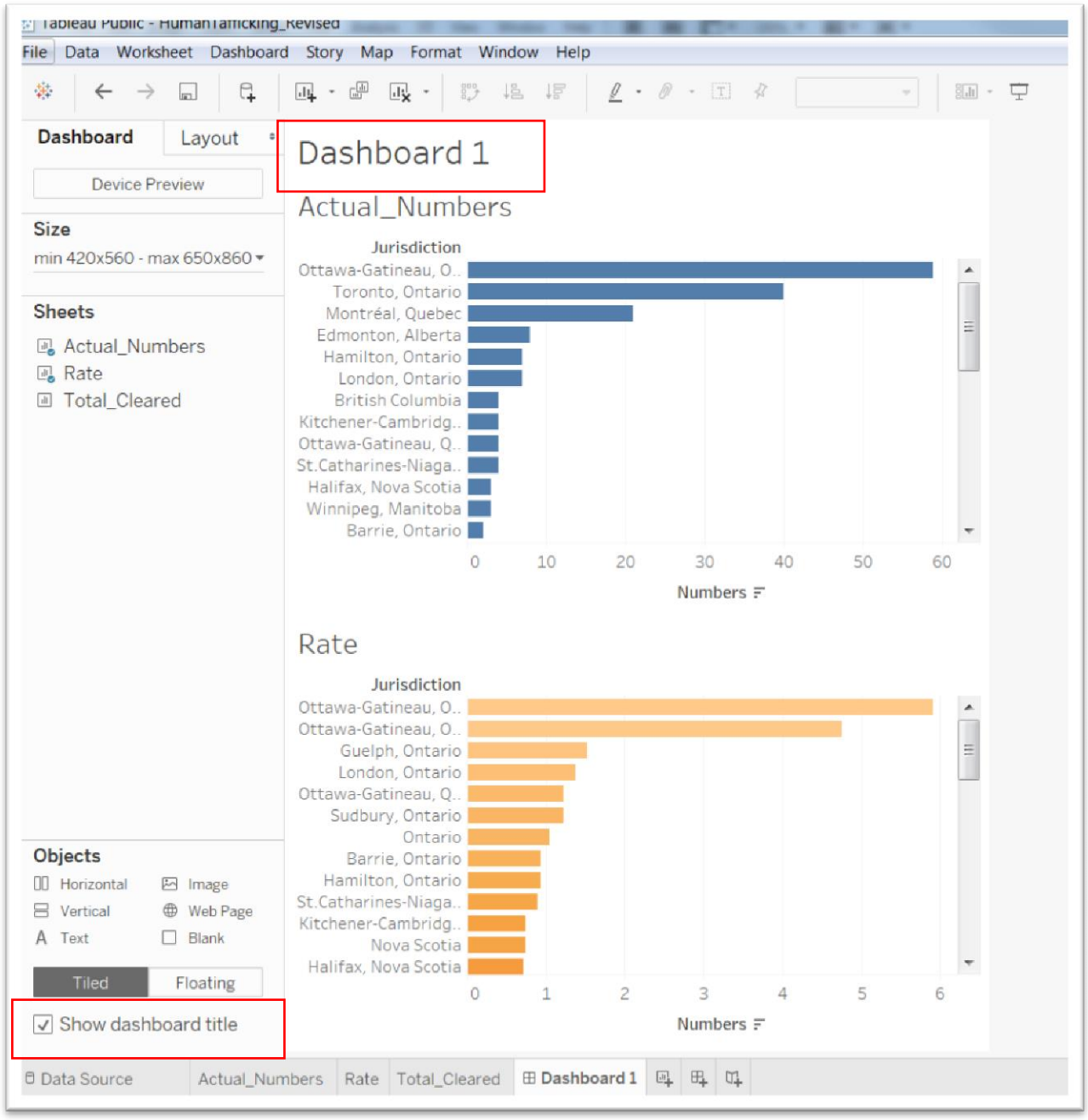
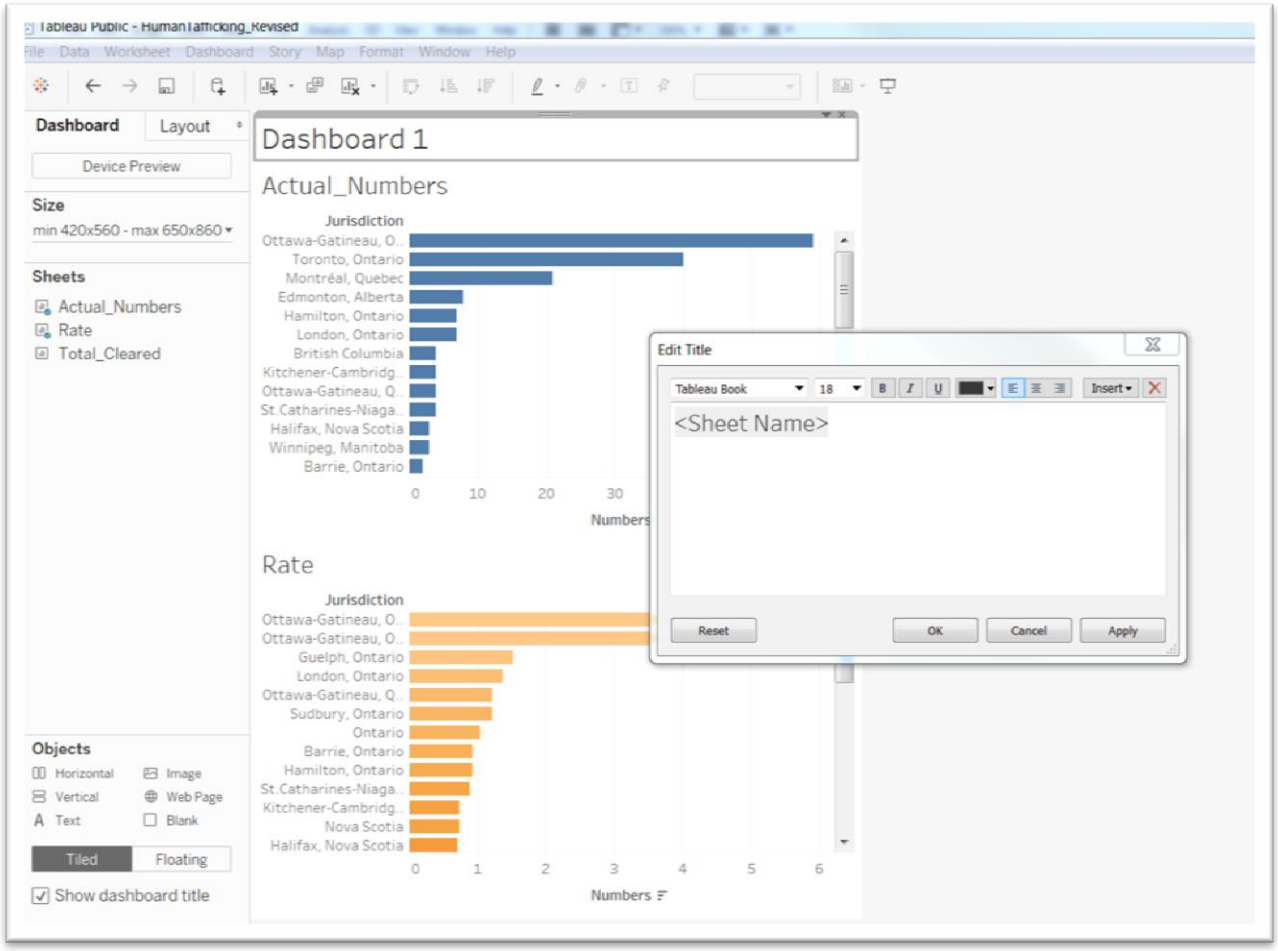


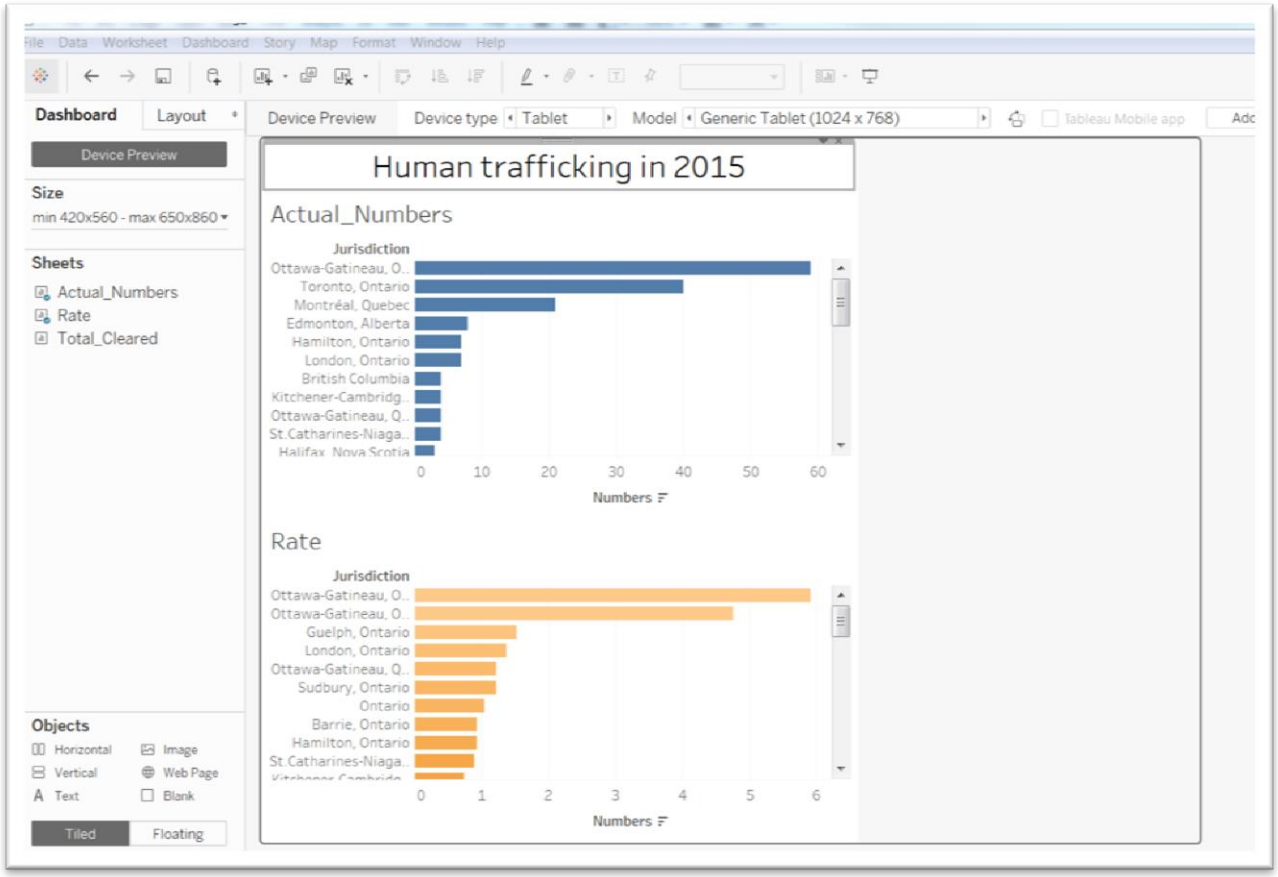
Tableau Public - HumanTrafficking_Revised
File Data Worksheet Dashboard Story Map Format Window Help
Dashboard
Layout
Device Preview
Size
min 420x560 - max 650x860
Sheets
Actual_Numbers
Rate
Total_Cleared
Objects
Horizontal
Image
Vertical
Web Page
Text
Blank
Tiled
Floating
Show dashboard title
Dashboard 1
Actual_Numbers
Jurisdiction
Ottawa-Gatineau, O..
Toronto, Ontario
Montréal, Quebec
Edmonton, Alberta
Hamilton, Ontario
London, Ontario
British Columbia
Kitchener-Cambridg..
Ottawa-Gatineau, Q..
St.Catharines-Niaga..
Halifax, Nova Scotia
Winnipeg, Manitoba
Barrie, Ontario
0 10 20 30 40 50 60
Numbers
Rate
Jurisdiction
Ottawa-Gatineau, O..
Ottawa-Gatineau, O..
Guelph, Ontario
London, Ontario
Ottawa-Gatineau, Q..
Sudbury, Ontario
Ontario
Barrie, Ontario
Hamilton, Ontario
St.Catharines-Niaga..
Kitchener-Cambridg..
Nova Scotia
Halifax, Nova Scotia
0 1 2 3 4 5 6
Numbers
Data Source
Actual_Numbers
Rate
Total_Cleared
Dashboard 1

At the top of the dashboard, you'll see the generic "Dashboard 1". Double-click on it to produce a dialogue box.

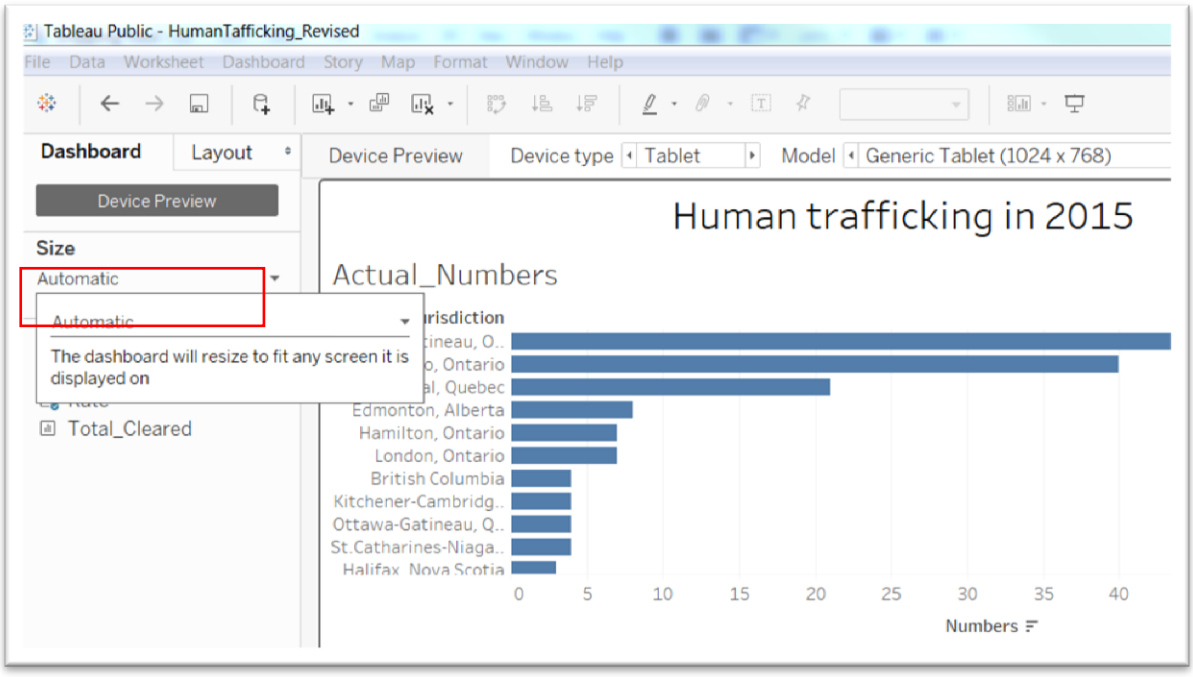


Create and format a new title.

To see what it looks like on the device that you choose for your display, click on the "Device Preview" tab on the left.

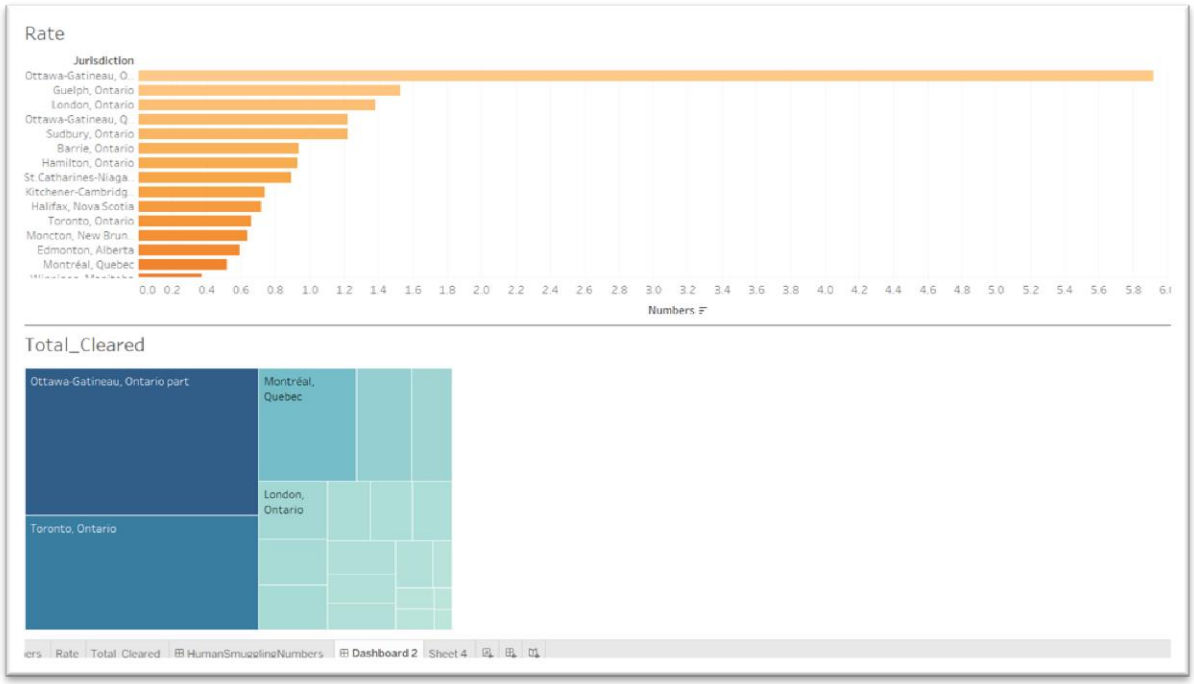


We can adjust the sizing to suit different platforms such as mobile devices, tablets or computers. Select the "Automatic" option from the drop-down menu obtained by clicking on the arrow highlighted below, and then the "Range" option. However, for the purposes of this exercise, let's choose the If you're happy with the result, rename the dashboard

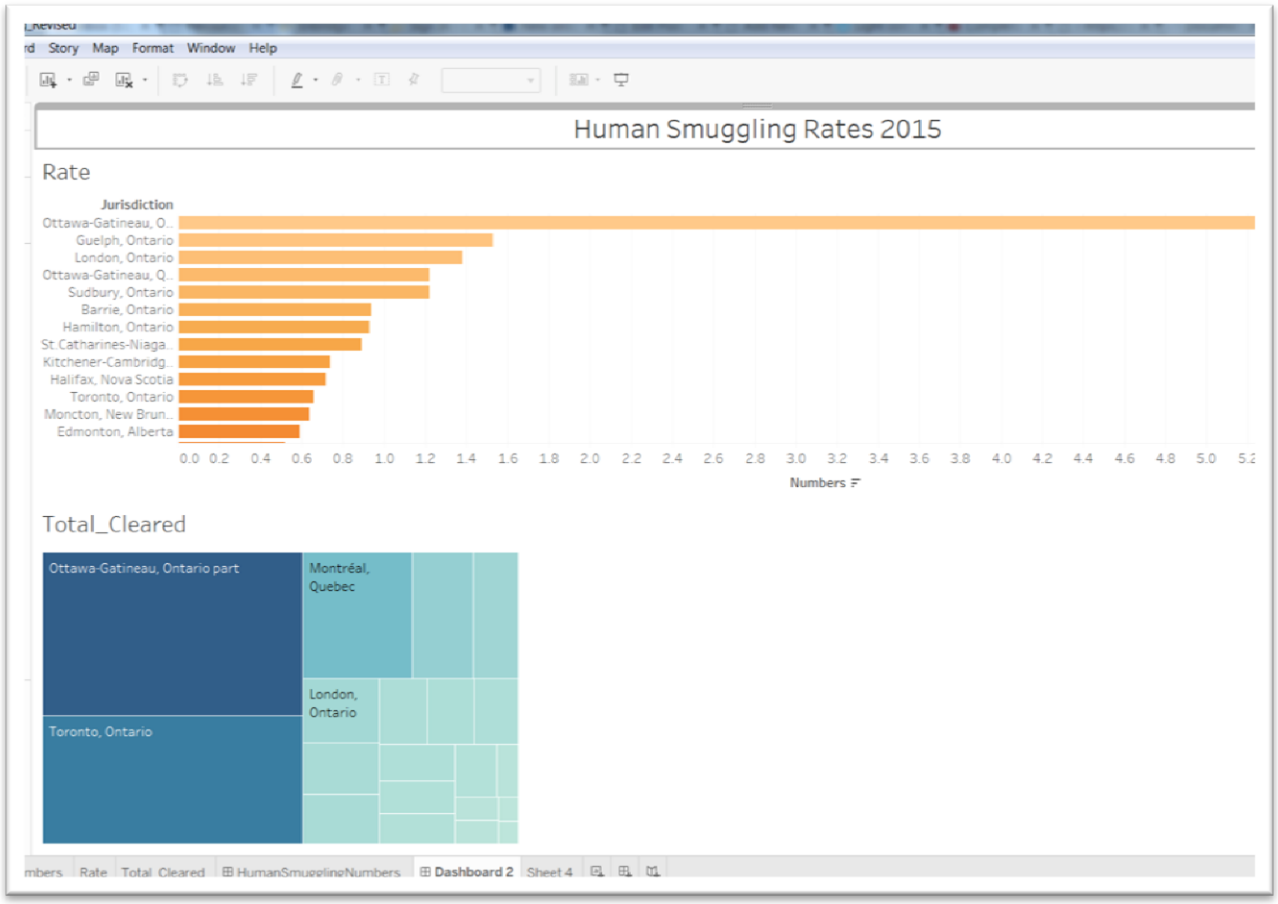


There's no need to be beholden to these charts as visualizations, as Tableau provides many options in its "Show Me" palette.

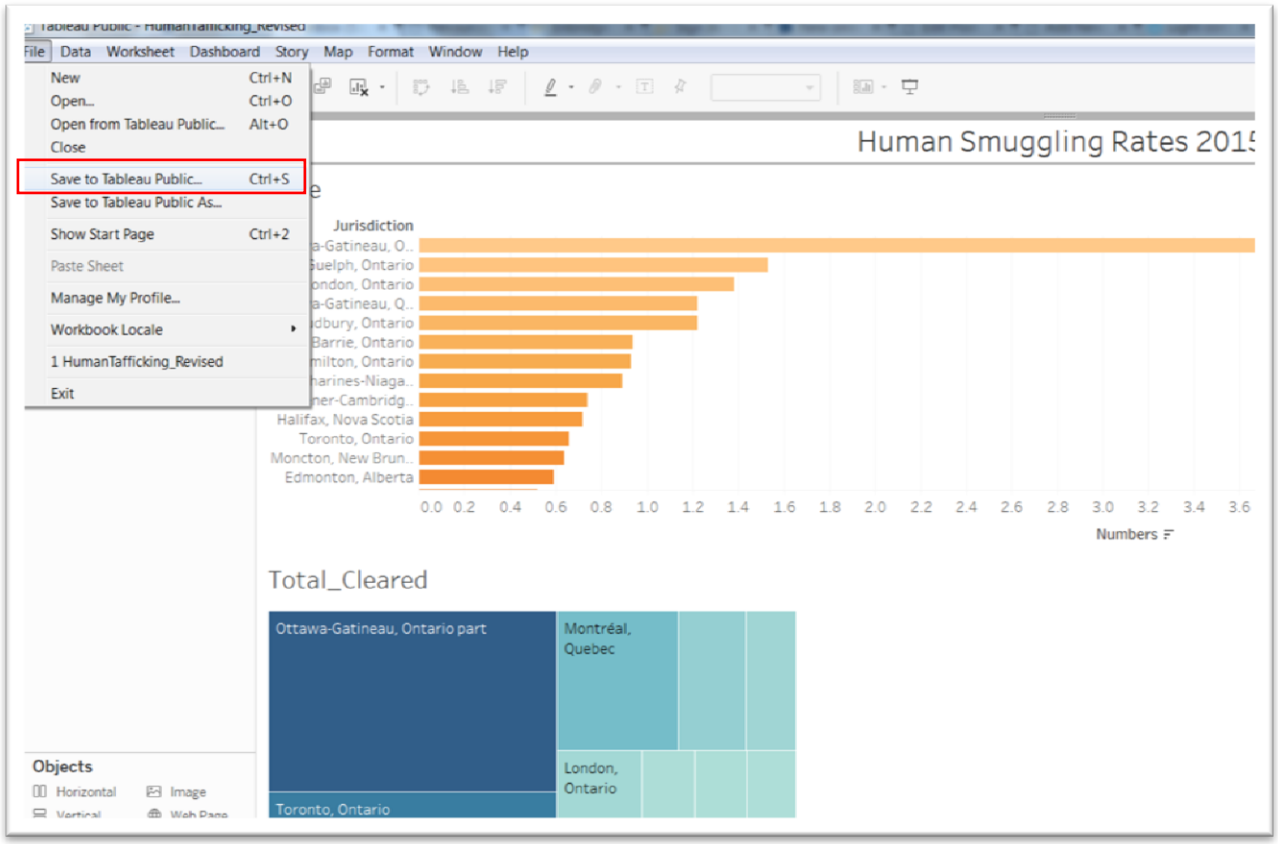
Following the steps we used to create this dashboard, let's create another one using the "Rate" and "Total_Cleared" categories.

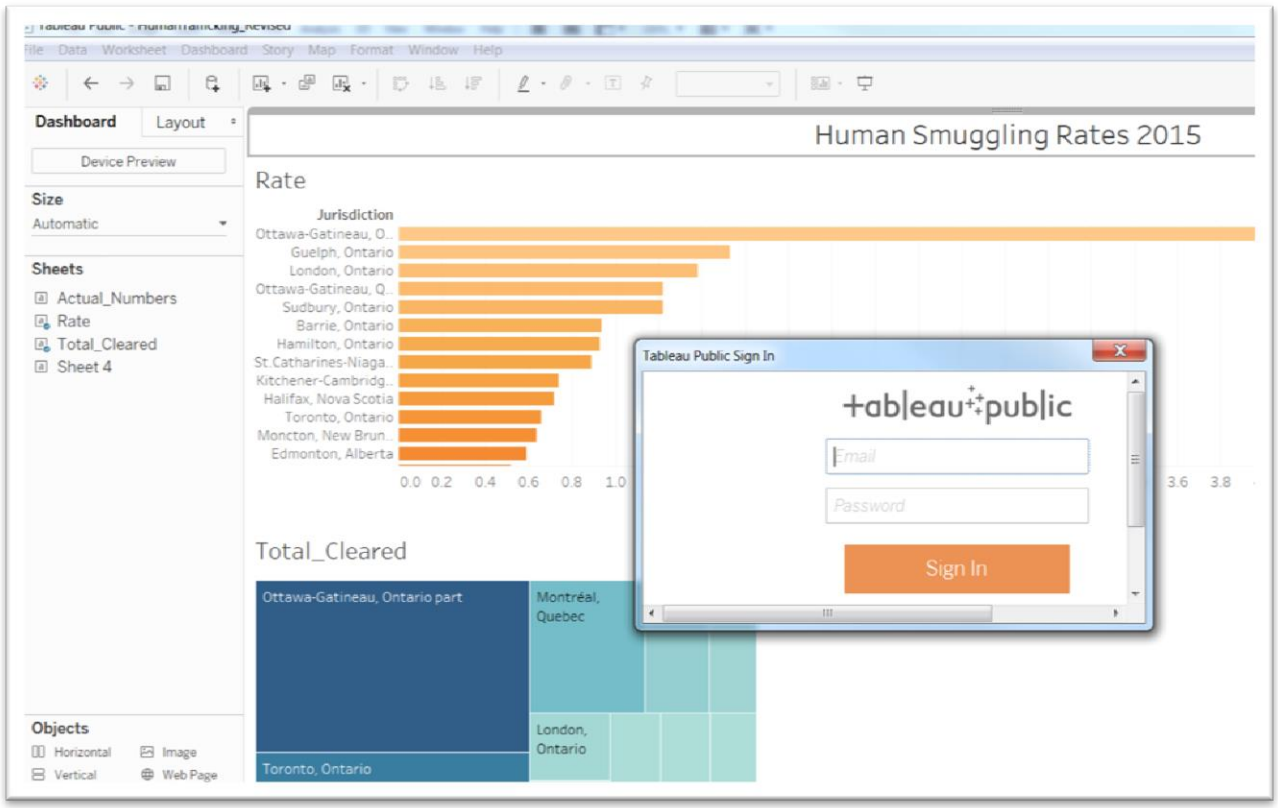


Rename this Dashboard.

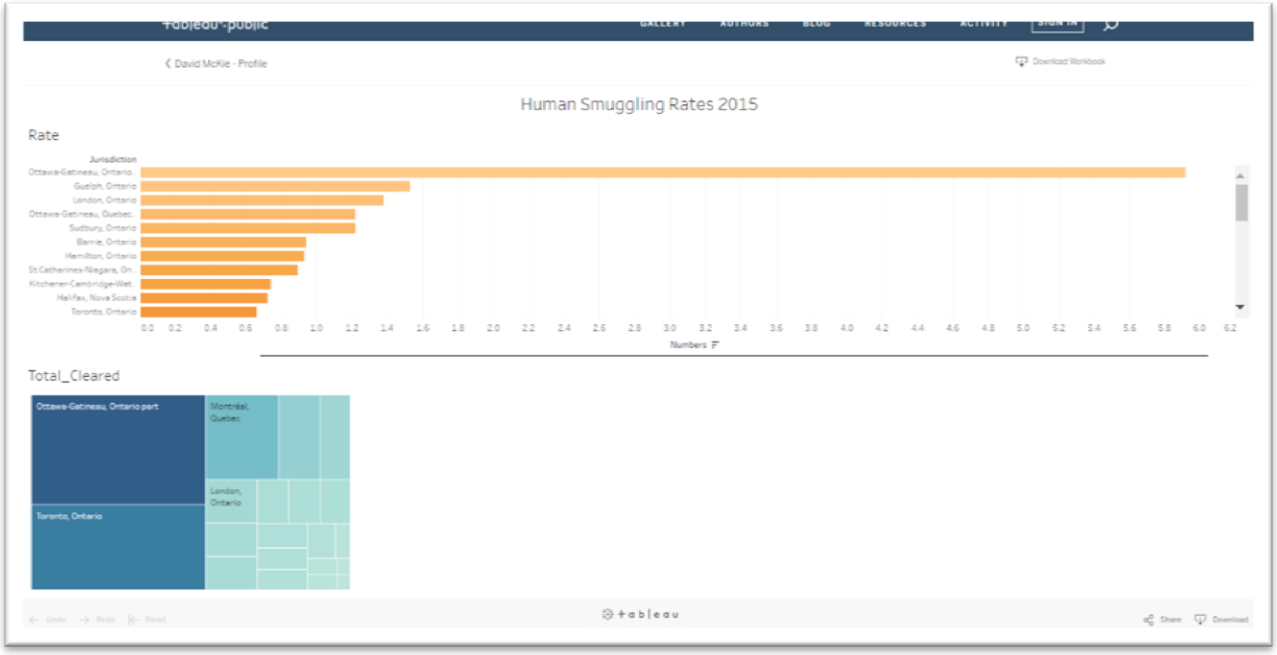


Once we've renamed this dashboard tab, then we can upload one dashboard visualization, and then the other, by going to "File" at the top left of the menu, and selecting "Save from Tableau Public" option.


File Data Worksheet Dashboard Story Map Format Window Help
New Ctrl+N
Open... Ctrl+O
Open from Tableau Public... Alt+O
Close
Save to Tableau Public... Ctrl+S
Save to Tableau Public As...
Show Start Page Ctrl+2
Paste Sheet
Manage My Profile...
Workbook Locale
1 HumanTafficking_Revised
Exit
Human Smuggling Rates 201
Jurisdiction
Halifax, Nova Scotia
Toronto, Ontario
Moncton, New Brun..
Edmonton, Alberta
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6 2.8 3.0 3.2 3.4 3.6
Numbers
Total_Cleared
Ottawa-Gatineau, Ontario part
Montréal, Quebec
London, Ontario
Toronto, Ontario
Objects
Horizontal
Image


Dashboard
Layout
Device Preview
Size
Automatic
Sheets
Actual_Numbers
Rate
Total_Cleared
Sheet 4
Human Smuggling Rates 2015
Rate
Jurisdiction
Ottawa-Gatineau, O..
Guelph, Ontario
London, Ontario
Ottawa-Gatineau, Q..
Sudbury, Ontario
Barrie, Ontario
Hamilton, Ontario
St.Catharines-Niaga..
Kitchener-Cambridg..
Halifax, Nova Scotia
Toronto, Ontario
Moncton, New Brun..
Edmonton, Alberta
Tableau Public Sign In
+ableau+public
Email
Password
Sign In
Total_Cleared
Ottawa-Gatineau, Ontario part
Montréal, Quebec
London, Ontario
Toronto, Ontario
Objects
Horizontal
Image
Vertical
Web Page

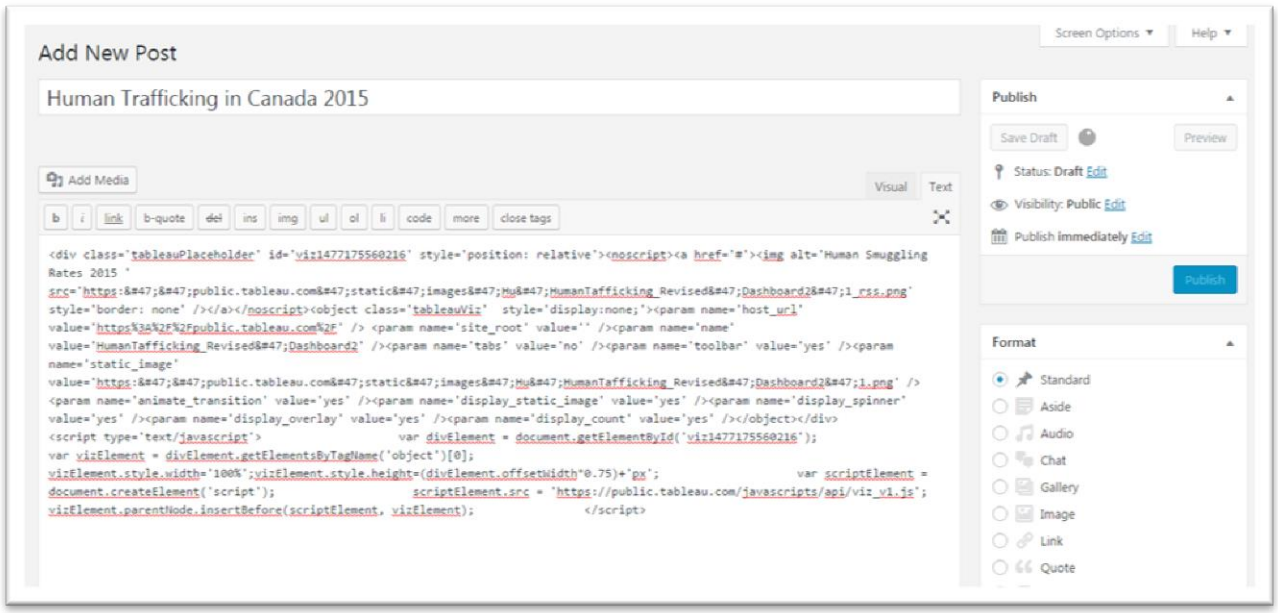
You'll obtain a "Tableau Public Sign In" dialogue box where you'll have to enter your email address and the password that you used to create the account at the beginning of this exercise. Signing in uploads your visualization to your browser.



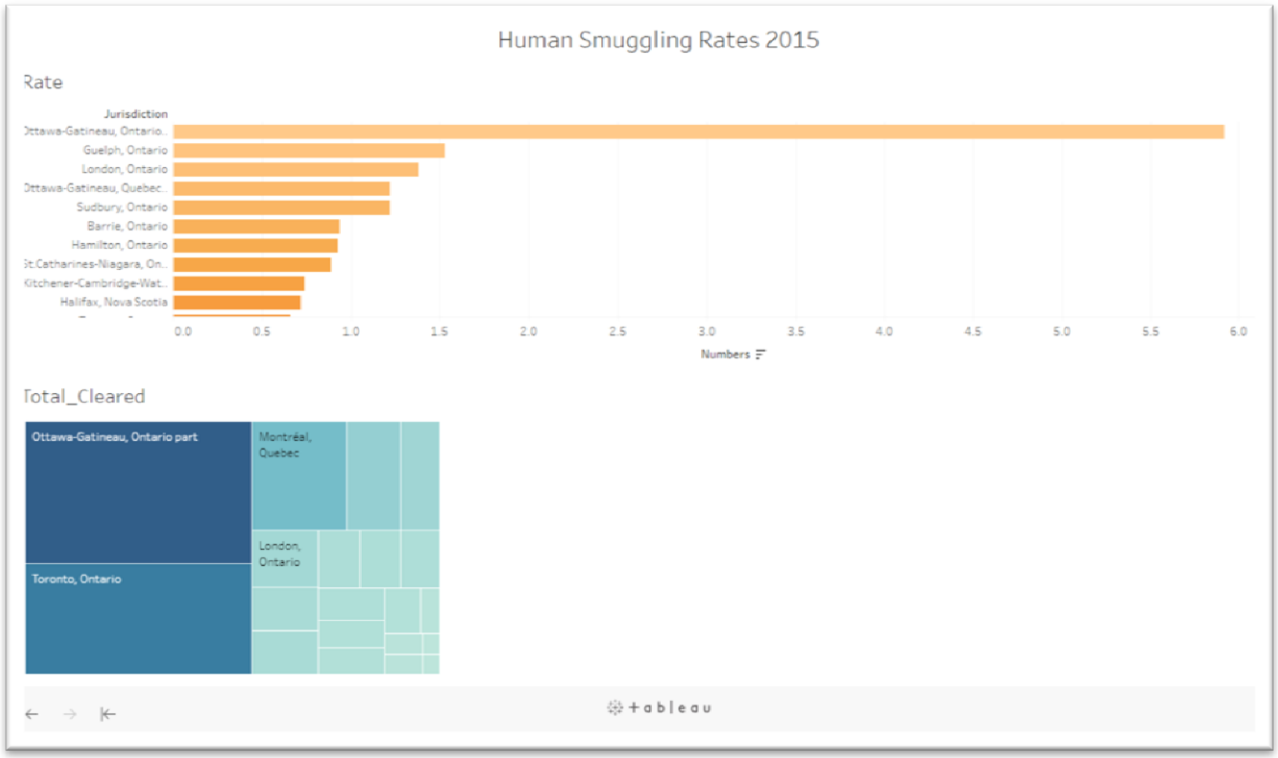
To obtain the embed code, we must share it by selecting the "Share" icon at the bottom right.

You can also see the option to download the Tableau workbook. Clicking on "Share" produces a link and an embed code.

Now all you have to do is copy the embed code, and paste it into your blog post.



Preview the result using the full screen option.



Using the same steps, you can upload the visualization on the second dashboard.

Tableau is an excellent choice for many visualizations, especially for uploading tables with geographic information such as countries or provinces. You can use map as a filter for tables that contain other important information that you want to convey.

Tableau Public's website contains many excellent starter tutorials that can help take your visualizations to an even higher level.