Data Visualization Workshop:

From the CDP Catalogue to creating Tableau Visualizations

Presented by: Jamie Carrick, Saeideh Hejazi, and Sasha Mosky

March 1, 2022

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Session Overview:

1. What is available through CDP?
   - Tableau as a member service

2. How do I create my own data visualizations using CDP Data?
   - Finding data in the CDP catalogue and using Beyond 20/20
   - Creating visualizations in Tableau

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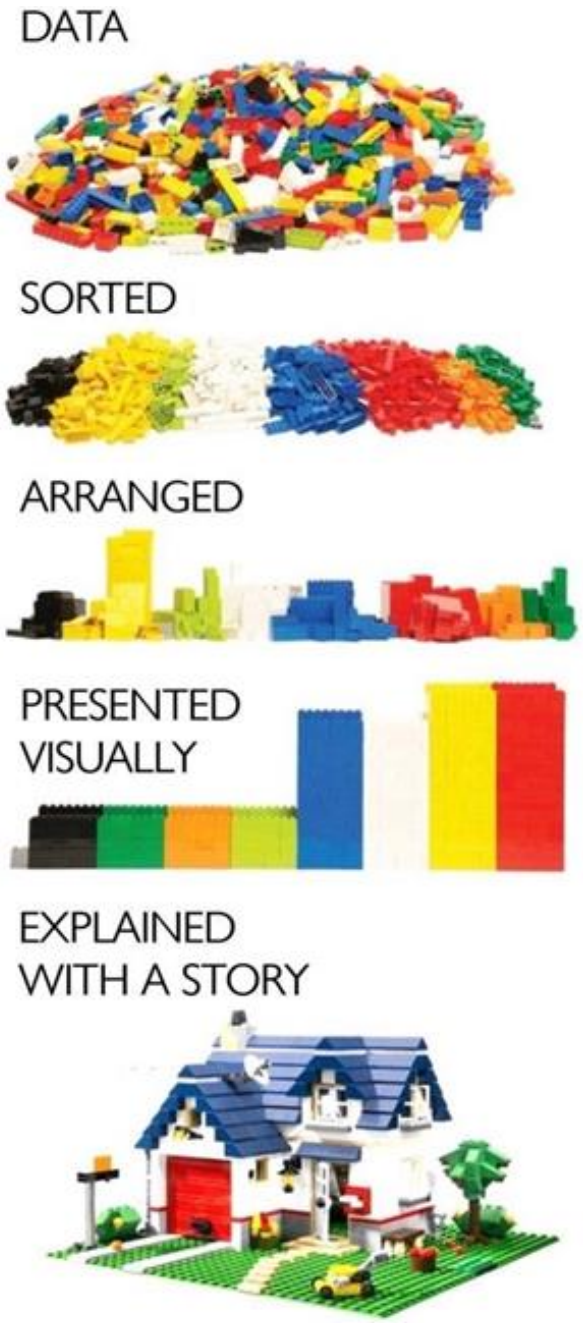
What is the value of data visualization?

- Transforms complex data into a story and allows readers to identify trends

- Allows reader to quickly interpret and draw conclusions from data



What is available through CDP?

- CDP Team has developed a range of data visualizations in Tableau

- Allows for communities across Canada to quickly access data specific to their geography without having to open Beyond 2020 or Excel

- Data visualizations can be easily opening on a desktop by downloading **Tableau Reader** or customized using **Tableau Public**

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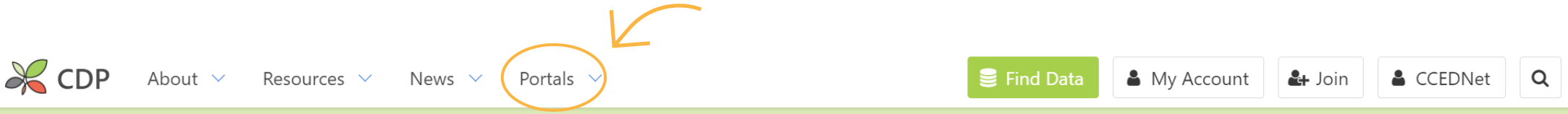
Tableau Products



Interactive Infographics and Dashboards

Home / Content / Interactive Infographics and Dashboards

This series of interactive dashboards, built using Tableau software, allows users to easily view and interact with data from the Community Data Program catalogue. Each dashboard explores a different theme and provides opportunities for users to visualize and analyze data at geographies of their choice. The dashboards are designed to be intuitive for users at all levels of data knowledge, and useable on both PC and Mac computers.

The software required to use these dashboards is Tableau Reader, which can be downloaded here for free. For more detailed instructions on installing and using Tableau Reader, click here.

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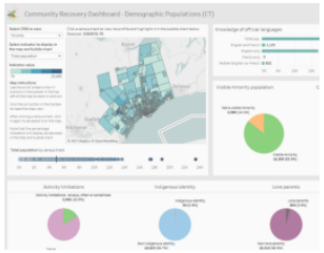
Tableau Products

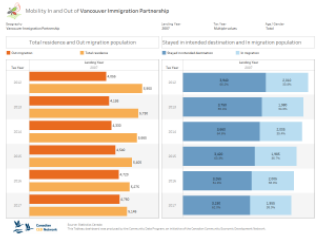


Community Recovery Dashboard - Version 2.0

The Community Recovery Dashboard is a monitoring tool for medium and long term COVID-19 recovery. The dashboard uses data from a variety of sources, including the Census and Labour Force Survey, to look at the state of geographic areas across Canada prior to the COVID-19 pandemic, in order to assess and compare their capacities for recovery from COVID-19's economic and health impacts.

The dashboard allows you to view profiles of individual geographies across Canada, ranging in scale from national to neighbourhood-sized, as well as compare select indicators across census tracts in a city using interactive maps and charts.

Click here to download this dashboard from the catalogue.

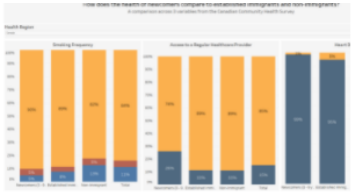


Mobility In and Out of Local Immigration Partnerships Dashboard

The Mobility In and Out of Local Immigration Partnerships Dashboard visualizes immigrant mobility data for custom LIP geographies using the Longitudinal Immigration Database (IMDB).

This dashboard allows you to compare mobility indicators by immigration admission category, admission year (or landing year), tax year, age and gender of immigrant taxfilers

Click here to download this dashboard from the catalogue.



Community Health Profile Dashboard

The Community Health Profile Dashboard provides a health overview of health regions across Canada, using data from the 2017/2018 Canadian Community Health Survey, including smoking frequency, access to a regular healthcare provider, and prevalence of hearth disease. These indicators are compared across the total, immigrant, recent immigrant populations.

Click here to download this dashboard from the catalogue.

...and many more!

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Tableau Products

Tableau offers a range of free software downloads:

- Tableau Reader – functions like Adobe PDF Readers
- Tableau Public Desktop – has similar functionality to the subscription version of Tableau, but files can not be saved locally

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Using Community Data Program data in Tableau

Presented by Jamie Carrick

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From Beyond 2020 to Tableau

- Most CDP data is in IVT format, openable only in Beyond 2020
- Tableau cannot read IVT tables – extraction is required
- Beyond 2020 can export to CSV, a Tableau friendly format
- The exact process will depend on the data and the needs of the project

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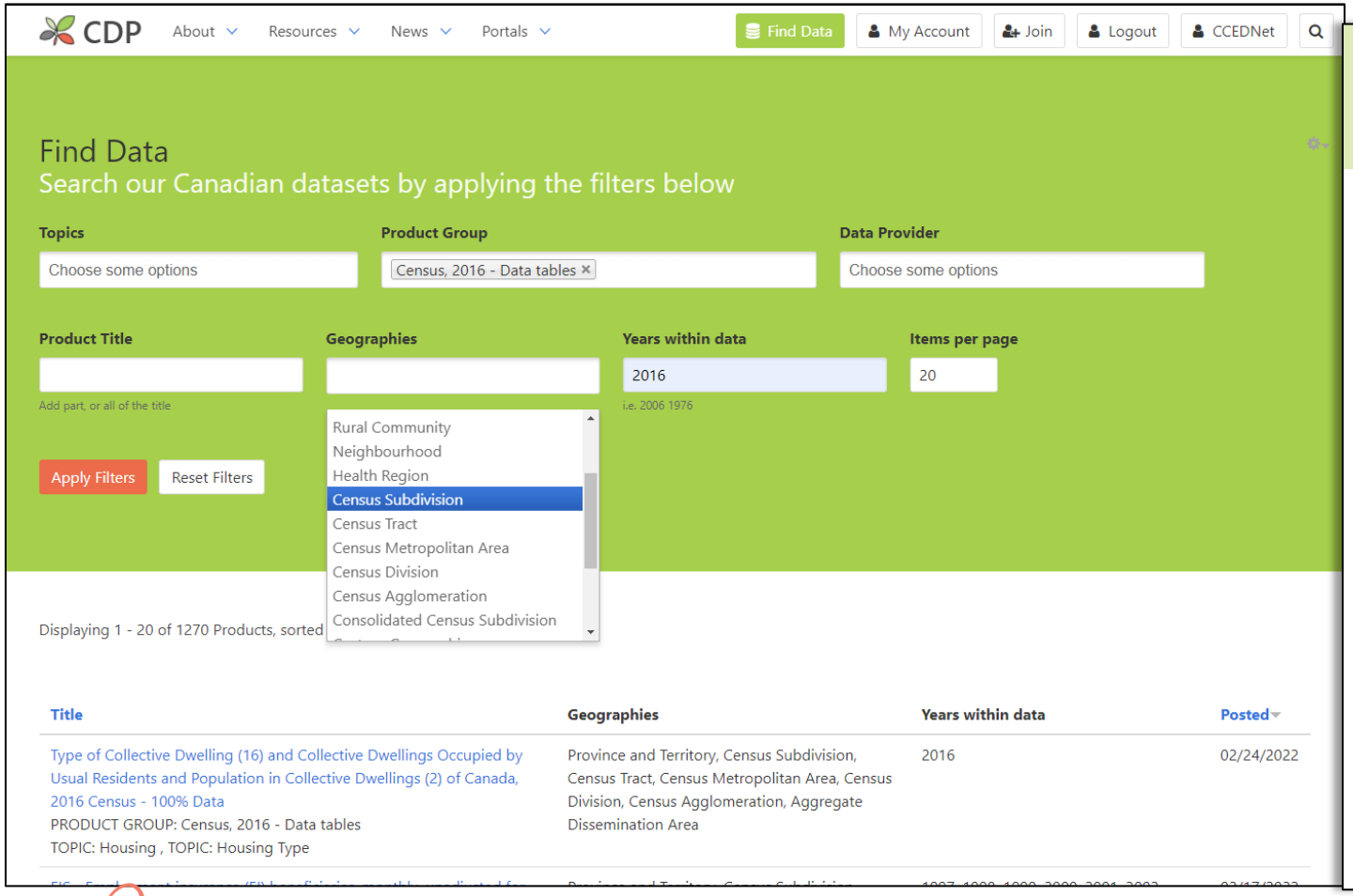
Downloading data from the CDP catalogue



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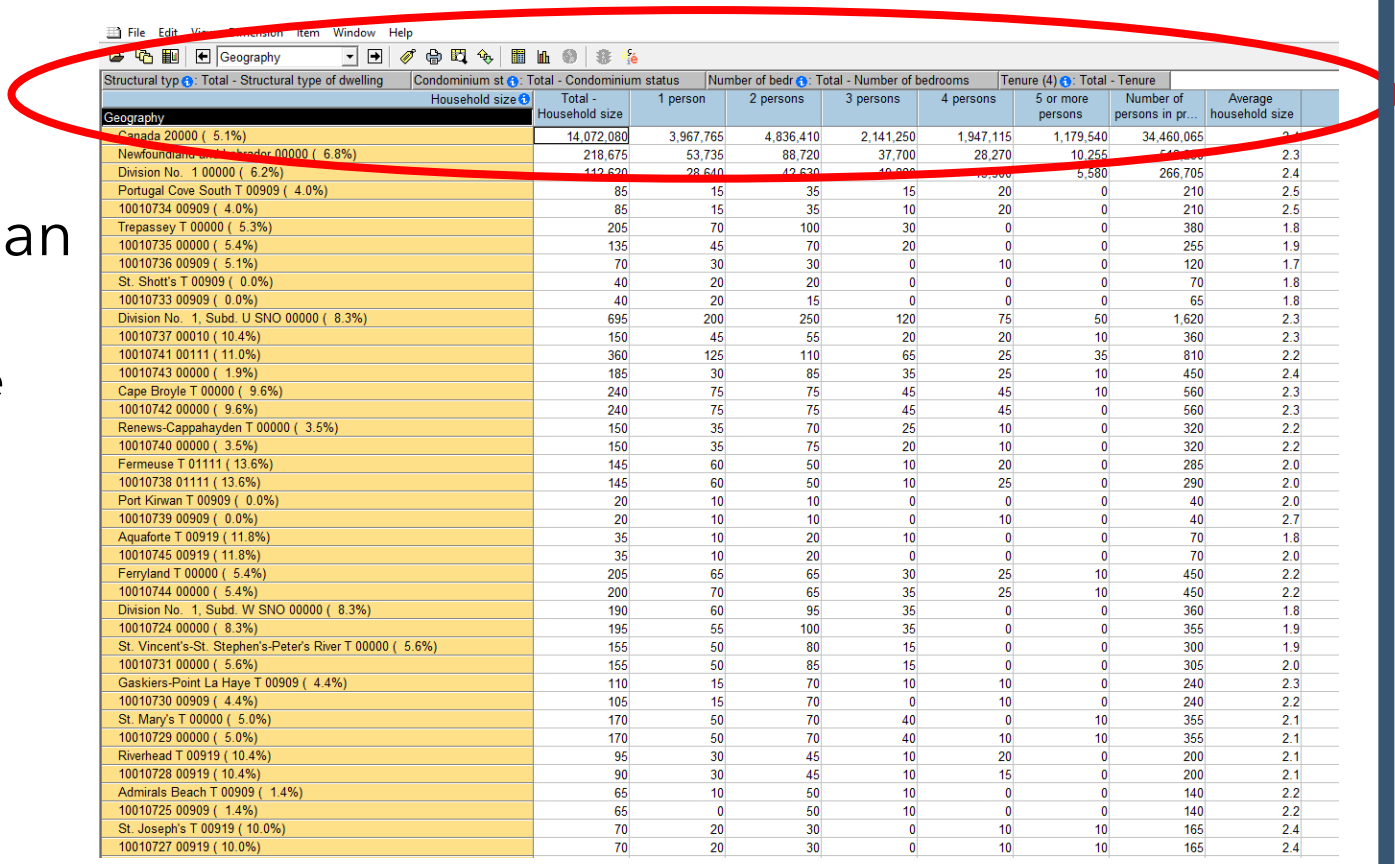
Challenge: Preserving the multidimensionality of IVT tables

- IVT tables often contain >2 dimensions
- Limiting extracts to 2 dimensions is an option
  - 1 geography dimension and 1 variable dimension
  - Or 2 variable dimensions for a single geography
- It is possible to capture many or all combinations of dimensions in a single export



File Edit Item Window Help

Geography

Structural typ: Total - Structural type of dwelling	Condominium st: Total - Condominium status			Number of bedr: Total - Number of bedrooms		Tenure (4): Total - Tenure		
Household size: Geography	Total - Household size	1 person	2 persons	3 persons	4 persons	5 or more persons	Number of persons in pr...	Average household size
Canada 20000 (5.1%)	14,072,080	3,967,765	4,836,410	2,141,250	1,947,115	1,179,540	34,460,065	
Newfoundland and Labrador 00000 (6.8%)	218,675	53,735	88,720	37,700	28,270	10,255		2.3
Division No. 1 00000 (6.2%)						5,580	266,705	2.4
Portugal Cove South T 00909 (4.0%)	85	15	35	15	20	0	210	2.5
10010734 00909 (4.0%)	85	15	35	10	20	0	210	2.5
Trepassey T 00000 (5.3%)	205	70	100	30	0	0	380	1.8
10010735 00000 (5.4%)	135	45	70	20	0	0	255	1.9
10010736 00909 (5.1%)	70	30	30	0	10	0	120	1.7
St. Shott's T 00909 (0.0%)	40	20	20	0	0	0	70	1.8
10010733 00909 (0.0%)	40	20	15	0	0	0	65	1.8
Division No. 1, Subd. U SNO 00000 (8.3%)	695	200	250	120	75	50	1,620	2.3
10010737 00010 (10.4%)	150	45	55	20	20	10	360	2.3
10010741 00111 (11.0%)	360	125	110	65	25	35	810	2.2
10010743 00000 (1.9%)	185	30	85	35	25	10	450	2.4
Cape Broyle T 00000 (9.6%)	240	75	75	45	45	10	560	2.3
10010742 00000 (9.6%)	240	75	75	45	45	0	560	2.3
Renews-Cappahayden T 00000 (3.5%)	150	35	70	25	10	0	320	2.2
10010740 00000 (3.5%)	150	35	75	20	10	0	320	2.2
Fermeuse T 01111 (13.6%)	145	60	50	10	20	0	285	2.0
10010738 01111 (13.6%)	145	60	50	10	25	0	290	2.0
Port Kirwan T 00909 (0.0%)	20	10	10	0	0	0	40	2.0
10010739 00909 (0.0%)	20	10	10	0	10	0	40	2.7
Aquaforte T 00919 (11.8%)	35	10	20	10	0	0	70	1.8
10010745 00919 (11.8%)	35	10	20	0	0	0	70	2.0
Ferryland T 00000 (5.4%)	205	65	65	30	25	10	450	2.2
10010744 00000 (5.4%)	200	70	65	35	25	10	450	2.2
Division No. 1, Subd. W SNO 00000 (8.3%)	190	60	95	35	0	0	360	1.8
10010724 00000 (8.3%)	195	55	100	35	0	0	355	1.9
St. Vincent's-St. Stephen's-Peter's River T 00000 (5.6%)	155	50	80	15	0	0	300	1.9
10010731 00000 (5.6%)	155	50	85	15	0	0	305	2.0
Gaskiers-Point La Haye T 00909 (4.4%)	110	15	70	10	10	0	240	2.3
10010730 00909 (4.4%)	105	15	70	0	10	0	240	2.2
St. Mary's T 00000 (5.0%)	170	50	70	40	0	10	355	2.1
10010729 00000 (5.0%)	170	50	70	40	10	10	355	2.1
Riverhead T 00919 (10.4%)	95	30	45	10	20	0	200	2.1
10010728 00919 (10.4%)	90	30	45	10	15	0	200	2.1
Admirals Beach T 00909 (1.4%)	65	10	50	10	0	0	140	2.2
10010725 00909 (1.4%)	65	0	50	10	0	0	140	2.2
St. Joseph's T 00919 (10.0%)	70	20	30	0	10	10	165	2.4
10010727 00919 (10.0%)	70	20	30	0	10	10	165	2.4

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Horizontal vs vertical table structures

Horizontal

- Numerical data stored in multiple columns
- Each column is a variable

Geography	Variable 1	Variable 2	Variable 3
Geo 1	x	x	x
Geo 2	x	x	x
Geo 3	x	x	x
Geo 4	x	x	x
Geo 5	x	x	x
…			

Vertical

- Data values are stored in a single column
- Each row is a single variable or combination of variables/ geographies
  - Non-numerical columns are dimensions
  - There is a row for each combination of variables in those dimensions
- Preferable in Tableau (in most cases)

Geography	Variable	Value
Geo 1	Variable 1	x
Geo 1	Variable 2	x
Geo 1	Variable 3	x
Geo 2	Variable 1	x
Geo 2	Variable 2	x
Geo 2	Variable 3	x
Geo 3	Variable 1	x
Geo 3	Variable 2	x
Geo 3	Variable 3	x
Geo 4	Variable 1	x
…		

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Including more dimensions

Geography	Dimension 1	Dimension 2	Value
Geo 1	Variable 1	Variable A	x
Geo 1	Variable 1	Variable B	x
Geo 1	Variable 1	Variable C	x
Geo 1	Variable 2	Variable A	x
Geo 1	Variable 2	Variable B	x
Geo 1	Variable 2	Variable C	x
…			

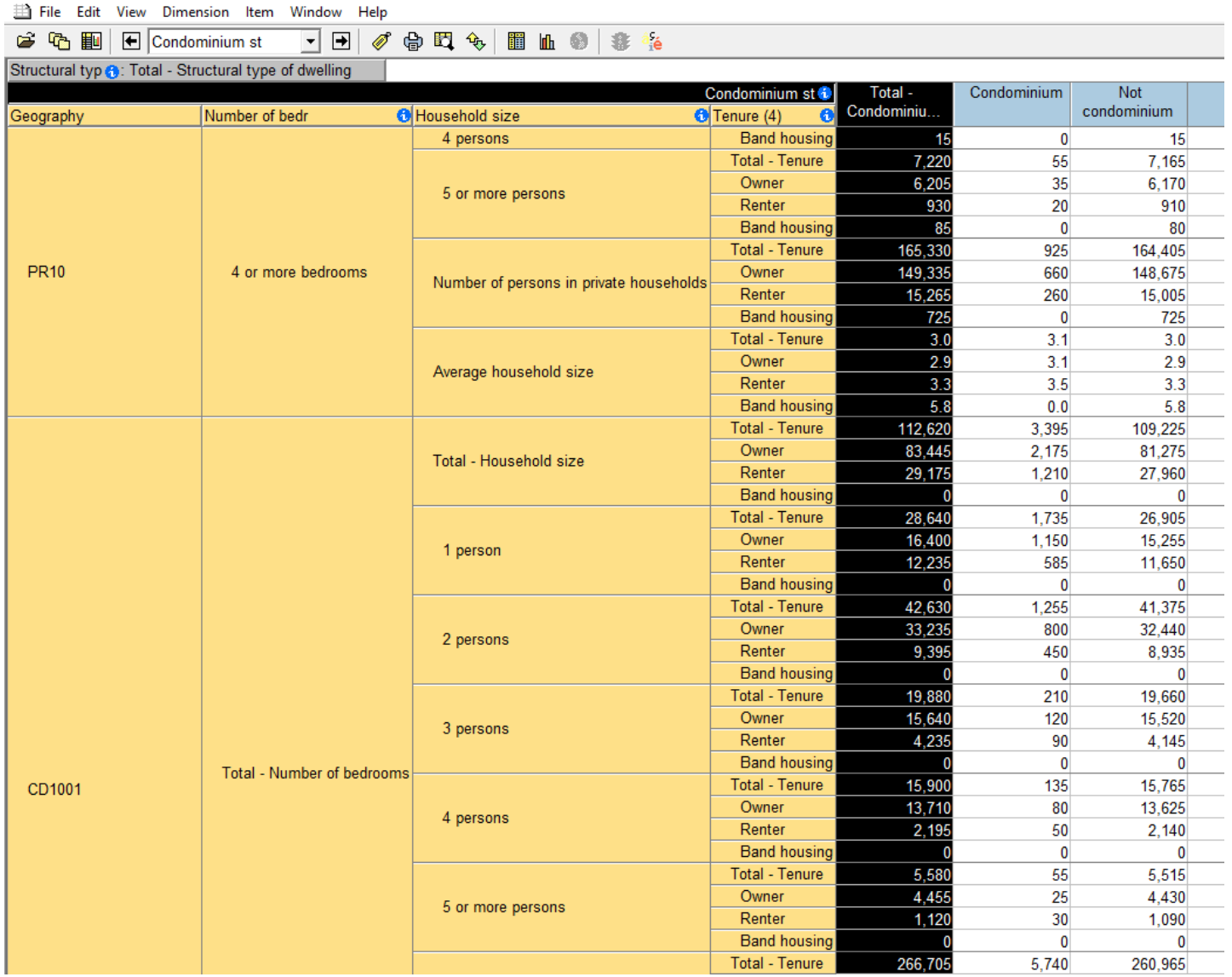
Many dimensions can be included using vertical table structure

- More dimensions = more rows in the export = larger file size
- File size is also dependant on the number of variables in each dimension

Geography	Dimension 1	Dimension 2	Dimension 3	Value
Geo 1	Variable 1	Variable A	Variable i	x
Geo 1	Variable 1	Variable A	Variable ii	x
Geo 1	Variable 1	Variable A	Variable iii	x
Geo 1	Variable 1	Variable B	Variable i	x
Geo 1	Variable 1	Variable B	Variable ii	x
Geo 1	Variable 1	Variable B	Variable iii	x
Geo 1	Variable 1	Variable C	Variable i	x
…				

Vertical Tables in Beyond 2020

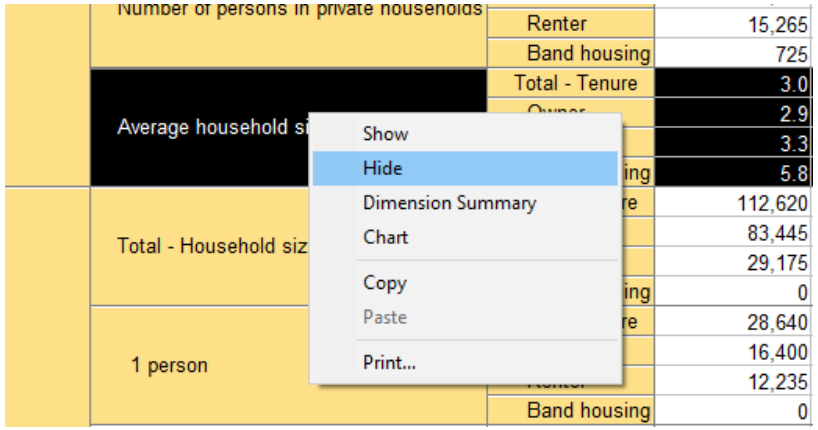
- Drag dimensions you wish to include next to geography
- One dimension will need to be on the x-axis
  - Can be a dimension you don't need (just highlight the total and export only that)
  - Otherwise can be pivoted later or left as columns
- Save as a CSV
  - Export can take a while (but it will work)



				Condominium st			
Geography	Number of bedr	Household size	Tenure (4)	Total - Condominiu...	Condominium	Not condominium	
PR10	4 or more bedrooms	4 persons	Band housing	15	0	15	
		5 or more persons	Total - Tenure	7,220	55	7,165	
			Owner	6,205	35	6,170	
			Renter	930	20	910	
			Band housing	85	0	80	
		Number of persons in private households	Total - Tenure	165,330	925	164,405	
			Owner	149,335	660	148,675	
			Renter	15,265	260	15,005	
			Band housing	725	0	725	
		Average household size	Total - Tenure	3.0	3.1	3.0	
			Owner	2.9	3.1	2.9	
			Renter	3.3	3.5	3.3	
			Band housing	5.8	0.0	5.8	
CD1001	Total - Number of bedrooms	Total - Household size	Total - Tenure	112,620	3,395	109,225	
			Owner	83,445	2,175	81,275	
			Renter	29,175	1,210	27,960	
			Band housing	0	0	0	
		1 person	Total - Tenure	28,640	1,735	26,905	
			Owner	16,400	1,150	15,255	
			Renter	12,235	585	11,650	
			Band housing	0	0	0	
		2 persons	Total - Tenure	42,630	1,255	41,375	
			Owner	33,235	800	32,440	
			Renter	9,395	450	8,935	
			Band housing	0	0	0	
		3 persons	Total - Tenure	19,880	210	19,660	
			Owner	15,640	120	15,520	
			Renter	4,235	90	4,145	
			Band housing	0	0	0	
		4 persons	Total - Tenure	15,900	135	15,765	
			Owner	13,710	80	13,625	
			Renter	2,195	50	2,140	
			Band housing	0	0	0	
		5 or more persons	Total - Tenure	5,580	55	5,515	
			Owner	4,455	25	4,430	
			Renter	1,120	30	1,090	
			Band housing	0	0	0	
			Total - Tenure	266,705	5,740	260,965	

Vertical Tables in Beyond 2020

- Dimensions not included can be used as filters
- Variables that are not needed can be hidden to exclude from export
  - Reduces size of export



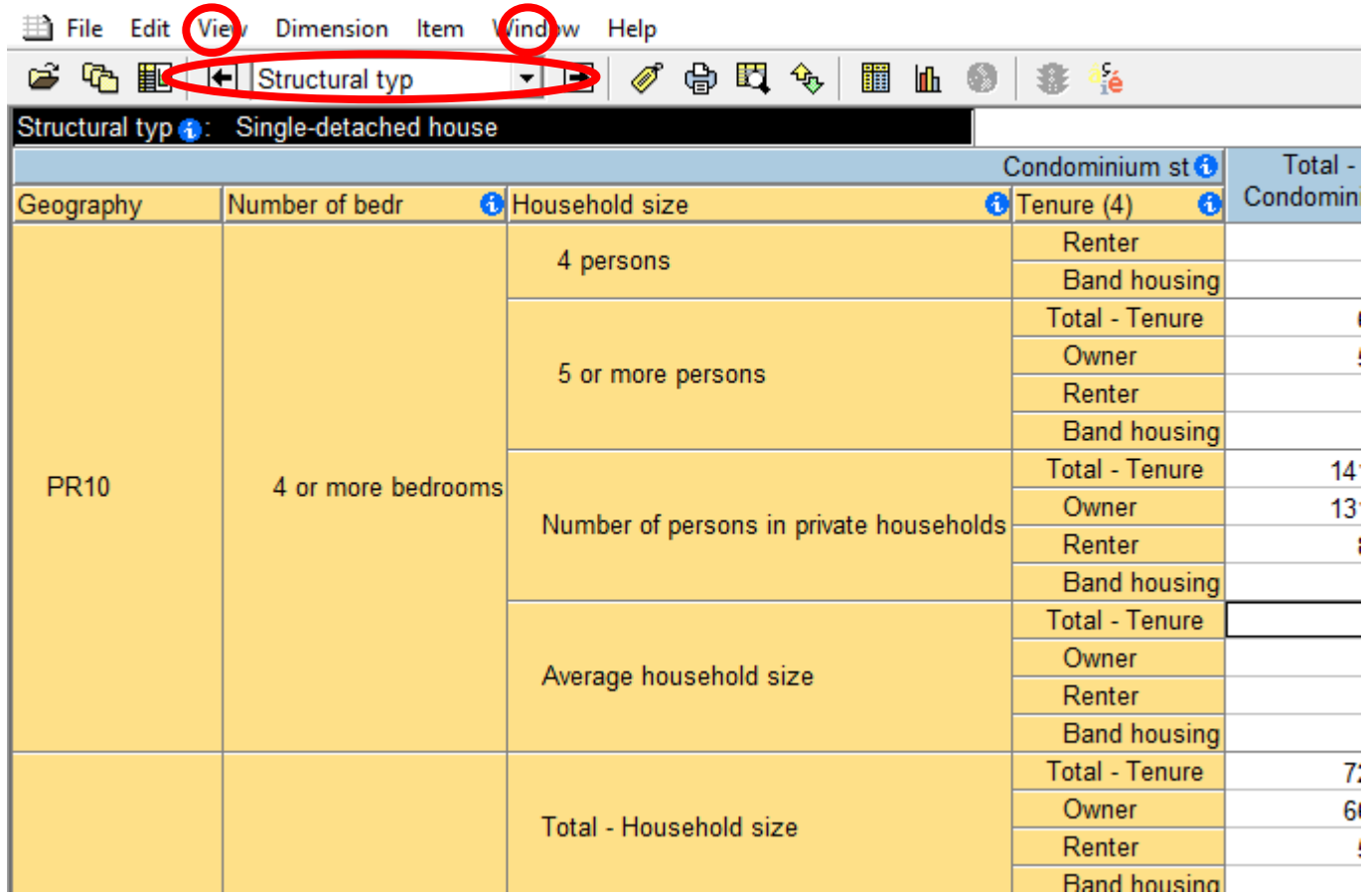


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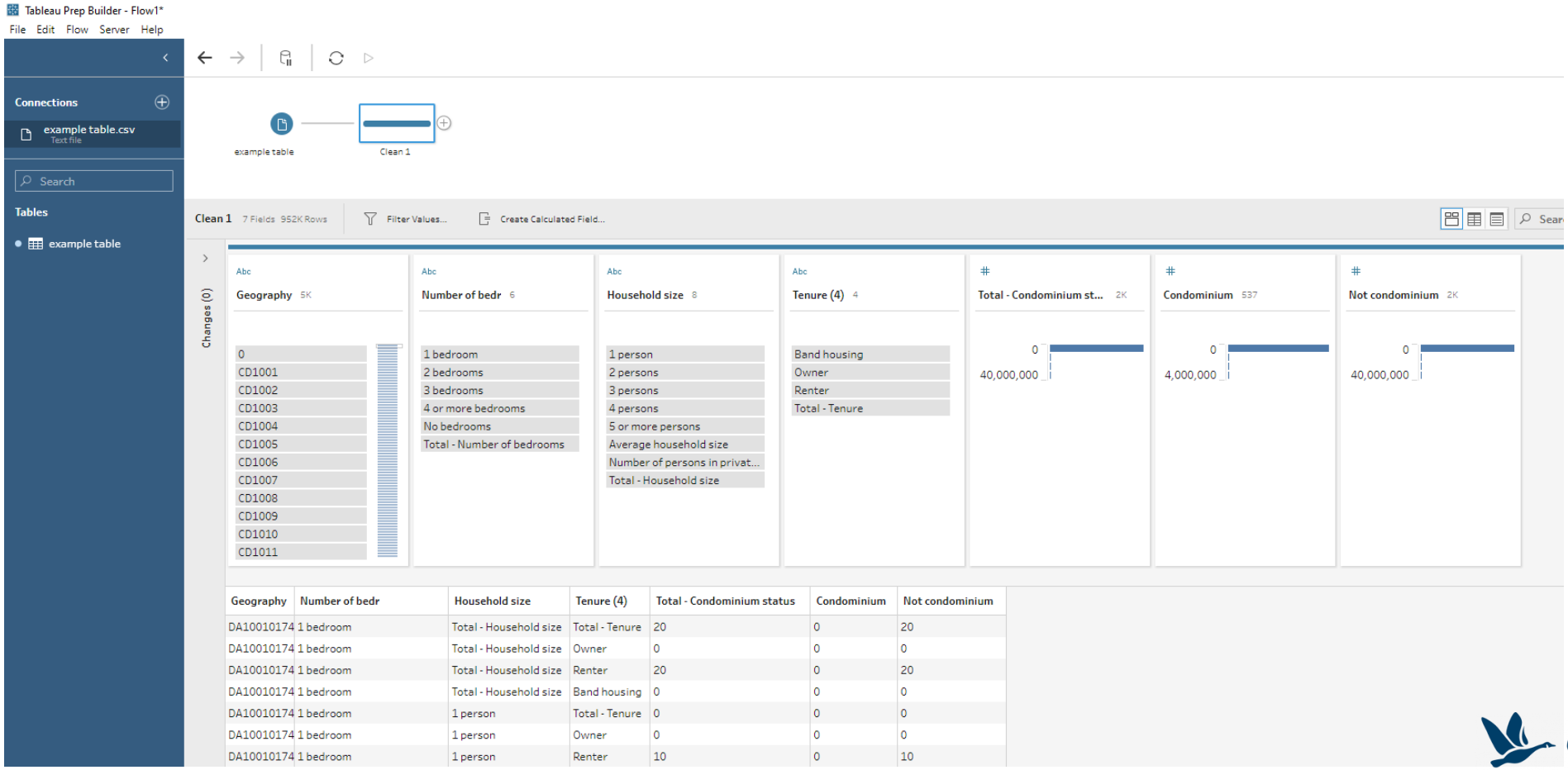
Tableau Prep Builder

- Can be used to prep tables for Tableau (when necessary)
- Allows data processing on tables too large for Excel



Geography	Number of bedr	Household size	Tenure (4)	Total - Condominium status	Condominium	Not condominium
DA10010174	1 bedroom	Total - Household size	Total - Tenure	20	0	20
DA10010174	1 bedroom	Total - Household size	Owner	0	0	0
DA10010174	1 bedroom	Total - Household size	Renter	20	0	20
DA10010174	1 bedroom	Total - Household size	Band housing	0	0	0
DA10010174	1 bedroom	1 person	Total - Tenure	0	0	0
DA10010174	1 bedroom	1 person	Owner	0	0	0
DA10010174	1 bedroom	1 person	Renter	10	0	10

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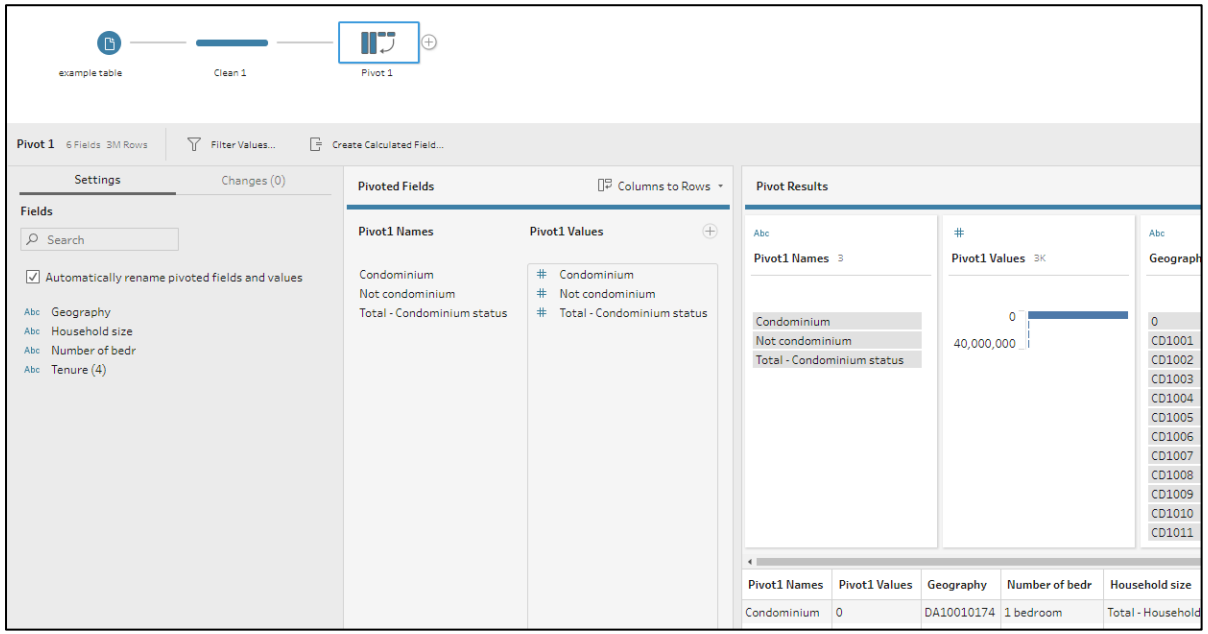
Tableau Prep

- Renaming columns and variables
- Pivot columns into rows
- Pivot rows into columns
- Perform calculations on columns
  - i.e. calculate inverses or percentages
- Join tables
  - i.e. joining geographic information
- Union tables
  - i.e. combine tables with same fields covering different regions or themes
- Export as Tableau Data Extract (.hyper)
  - Preferable format for working in Tableau
- Many of these functions are available in Tableau Desktop, but Prep directly edits the table



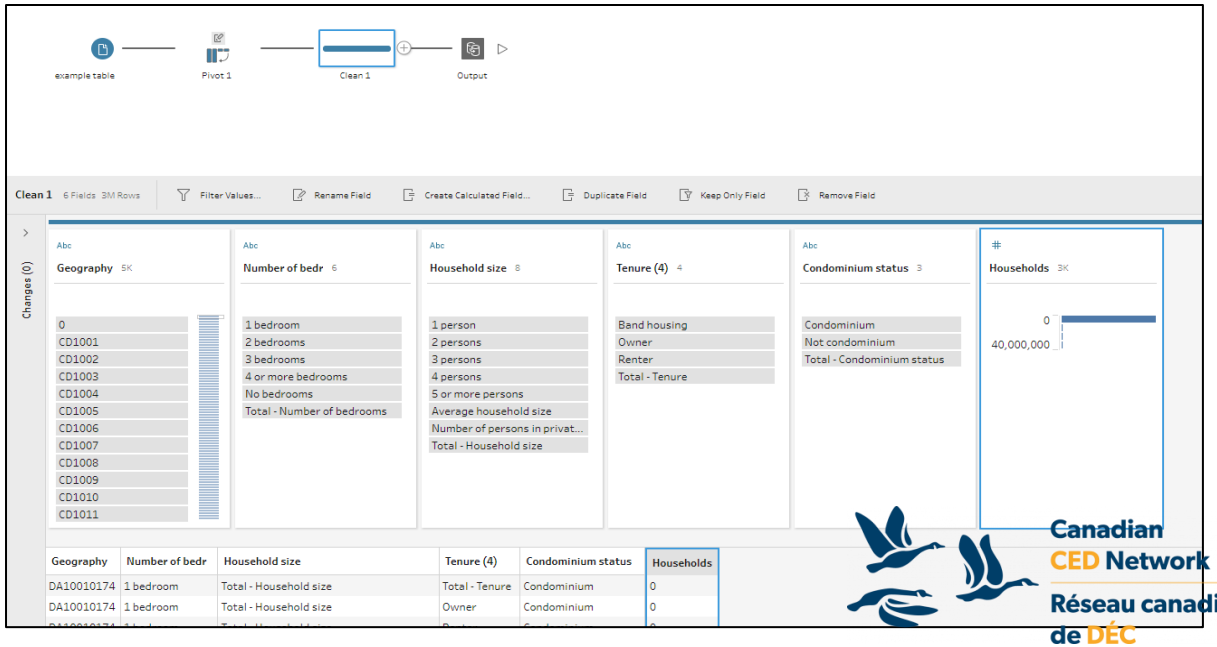


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Tableau Desktop

- Columns with variable names will be recognized as dimensions in Tableau. Numerical data columns will be recognized as measures.
- Filter dimensions to choose a variable to display
  - When selecting variables, all dimensions should be filtered
  - Variable values are the measure fields
- Drag dimensions to rows/columns to create charts

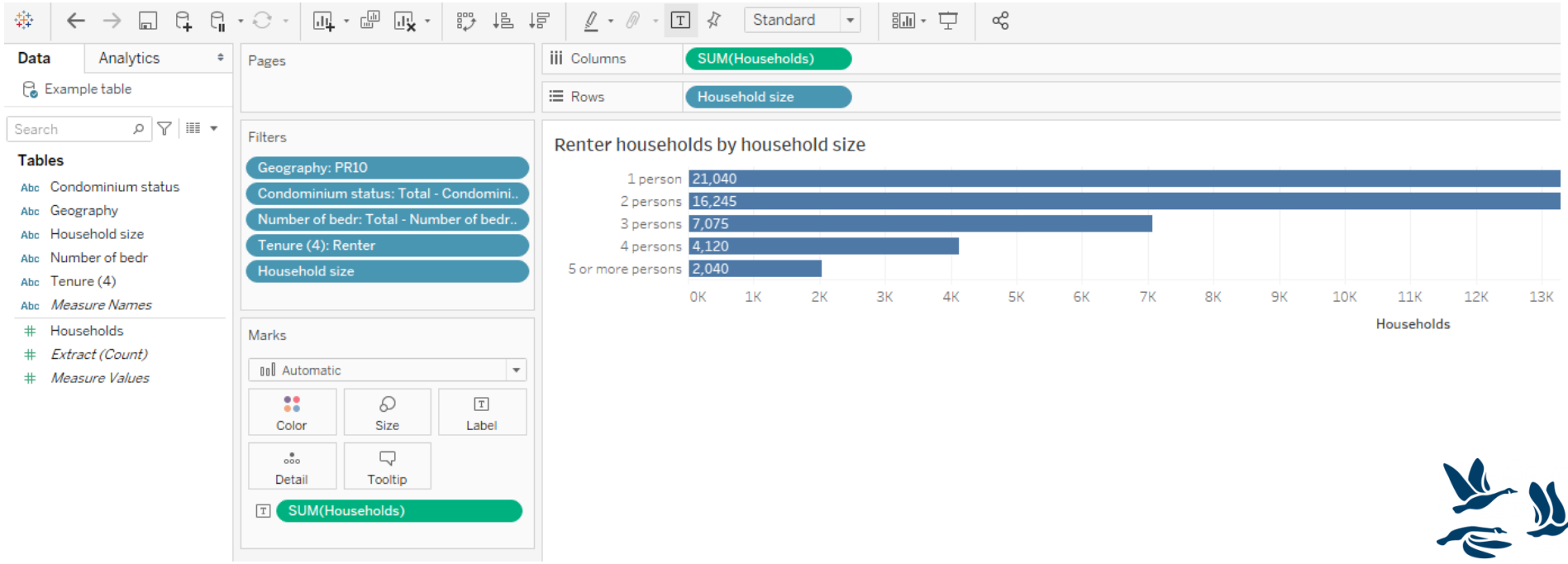

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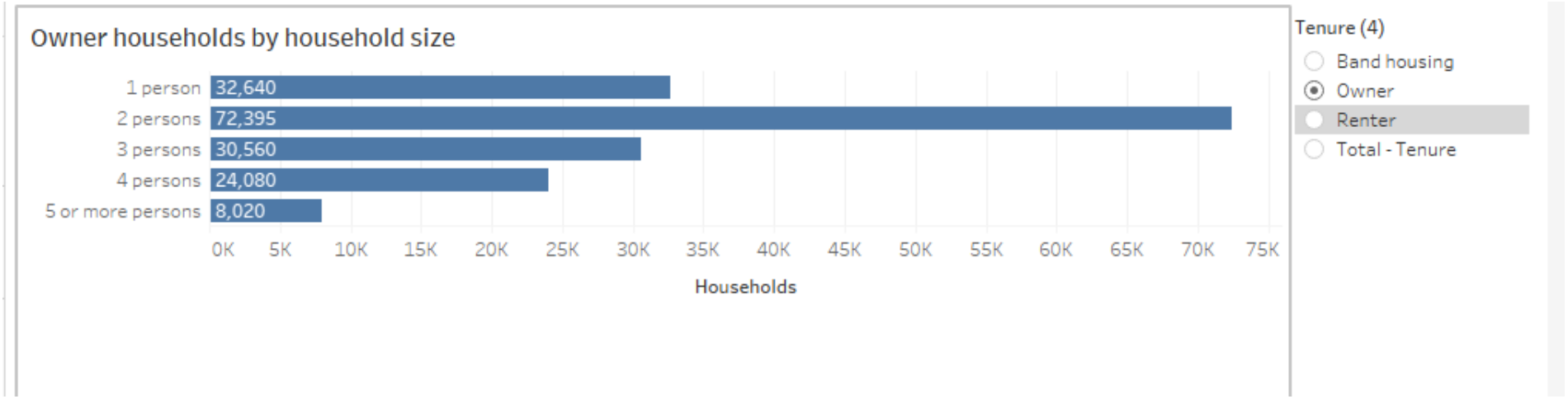
Tableau Desktop

- Dimensions can be used to provide filter options for users
  - Note: avoid selecting "(All)" when dimension contains a total



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Thank you!

Questions?

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Using Tableau to Create Data Visualizations

Presented by Saeideh Hejazi

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Define the purpose of the visualization

This dashboard represents **Population** of Canada in **2016** by **Province / Territory**, **Census Division** and **Census Subdivision,** as **charts** and **maps.**

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Get spatial data from the Statistics Canada website

Statistics Canada / Statistique Canada

Search website

Subjects | Data | Analysis | Reference | Geography | Census | Surveys and statistical programs | About StatCan | Canada.ca

Home > Census Program > Geography > Boundary files > 2016 Census - Boundary files

2016 Census - Boundary files

There are two types of boundary files: cartographic and digital. Cartographic boundary files portray the geographic areas using only the major land mass of Canada and its coastal islands. Digital boundary files portray the full extent of the geographic areas, including the coastal water area.

A reference guide is included.

Boundary files options

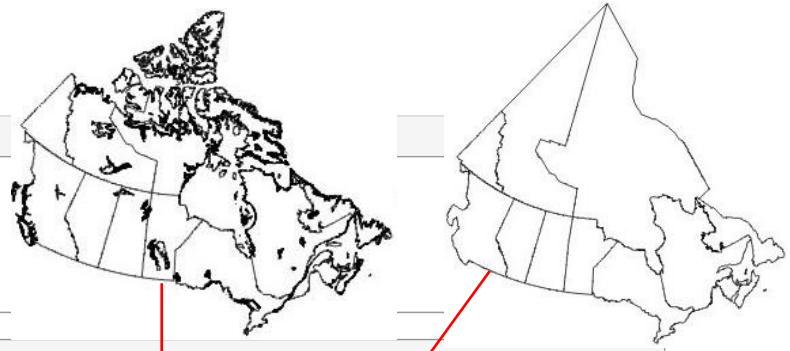
To download this product, please select from the choices below:

Language

English French

Format

- ArcGIS ® (.shp)
- Geography Markup Language (.gml)
- MapInfo ® (.tab)



Boundary files

Geographic area or water feature	Cartographic Boundary File	Digital Boundary File	Water File
Provinces/territories	○	○	...
Federal electoral districts (2013 Representation Order)	○	○	...
Economic regions	○	○	...
Census divisions	○	○	...
Aggregate dissemination areas	○	○	...
Census agricultural regions	○	○	...
Census consolidated subdivisions	○	○	...
Census subdivisions	●	○	...
Census metropolitan areas and	○	○	...

Link to [2016 Census - Boundary files]

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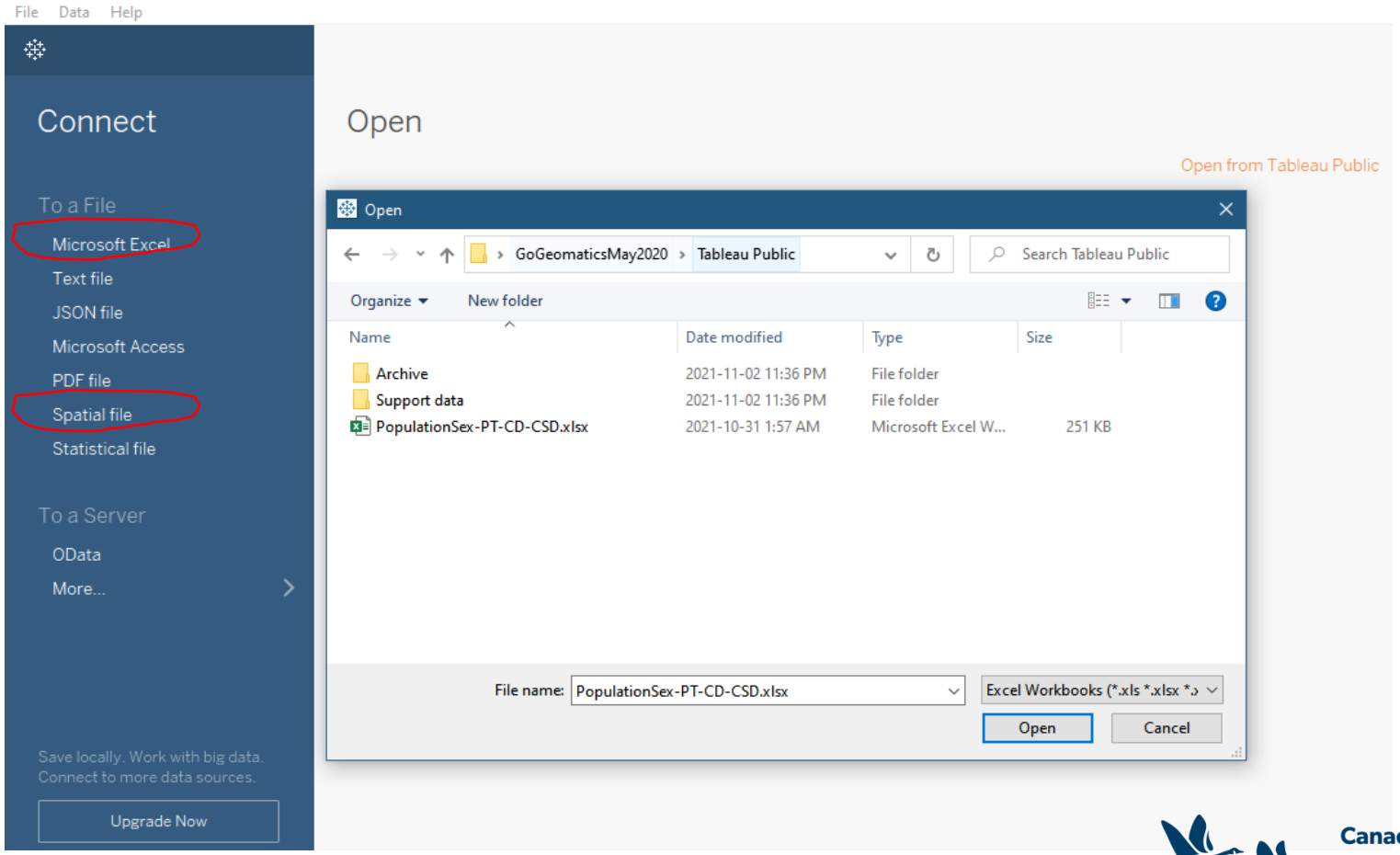
Add connections to Tableau Data Source:

Connecting to your data…



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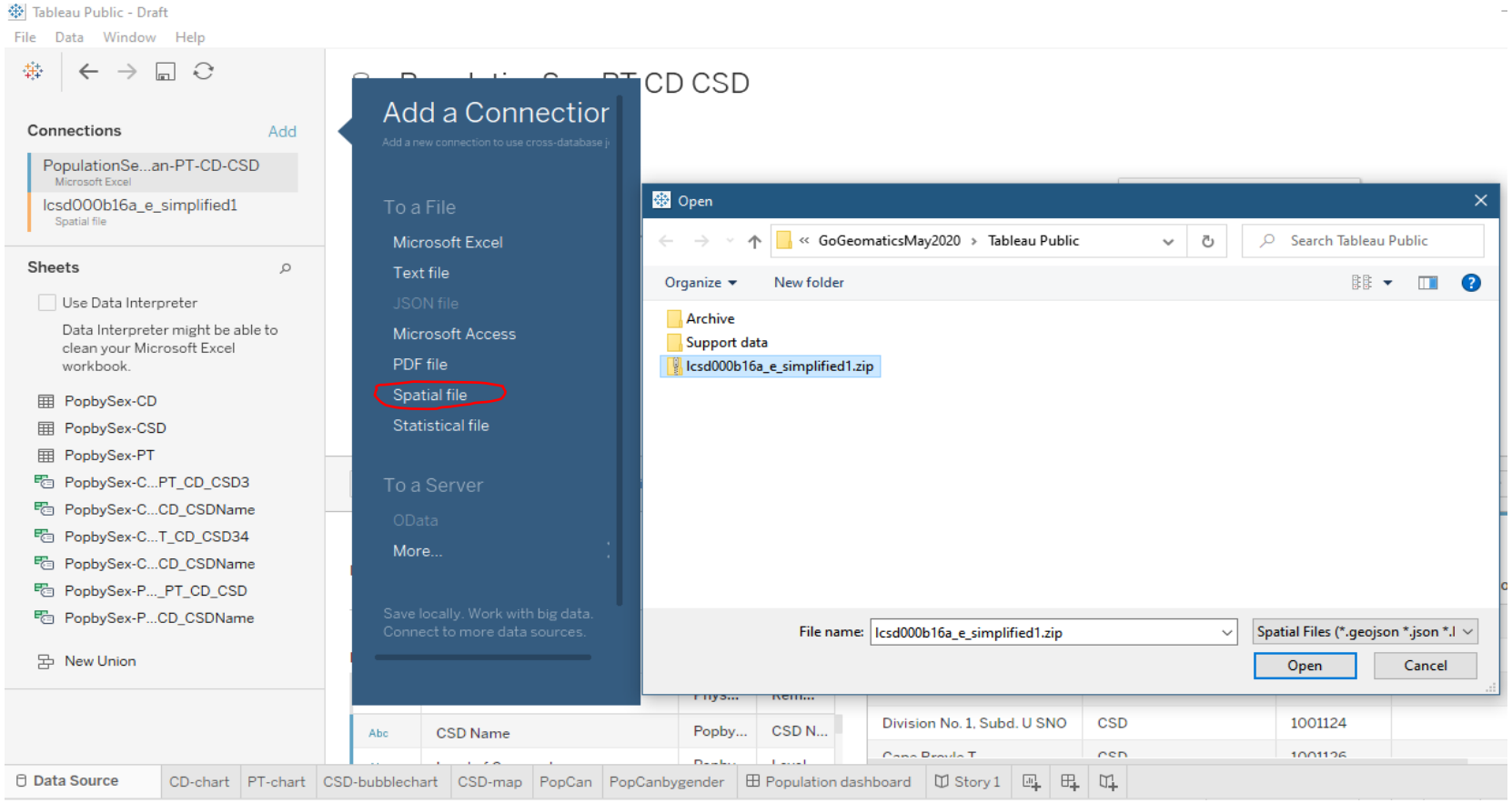
Add connections to Tableau Data Source

Connecting to your data…



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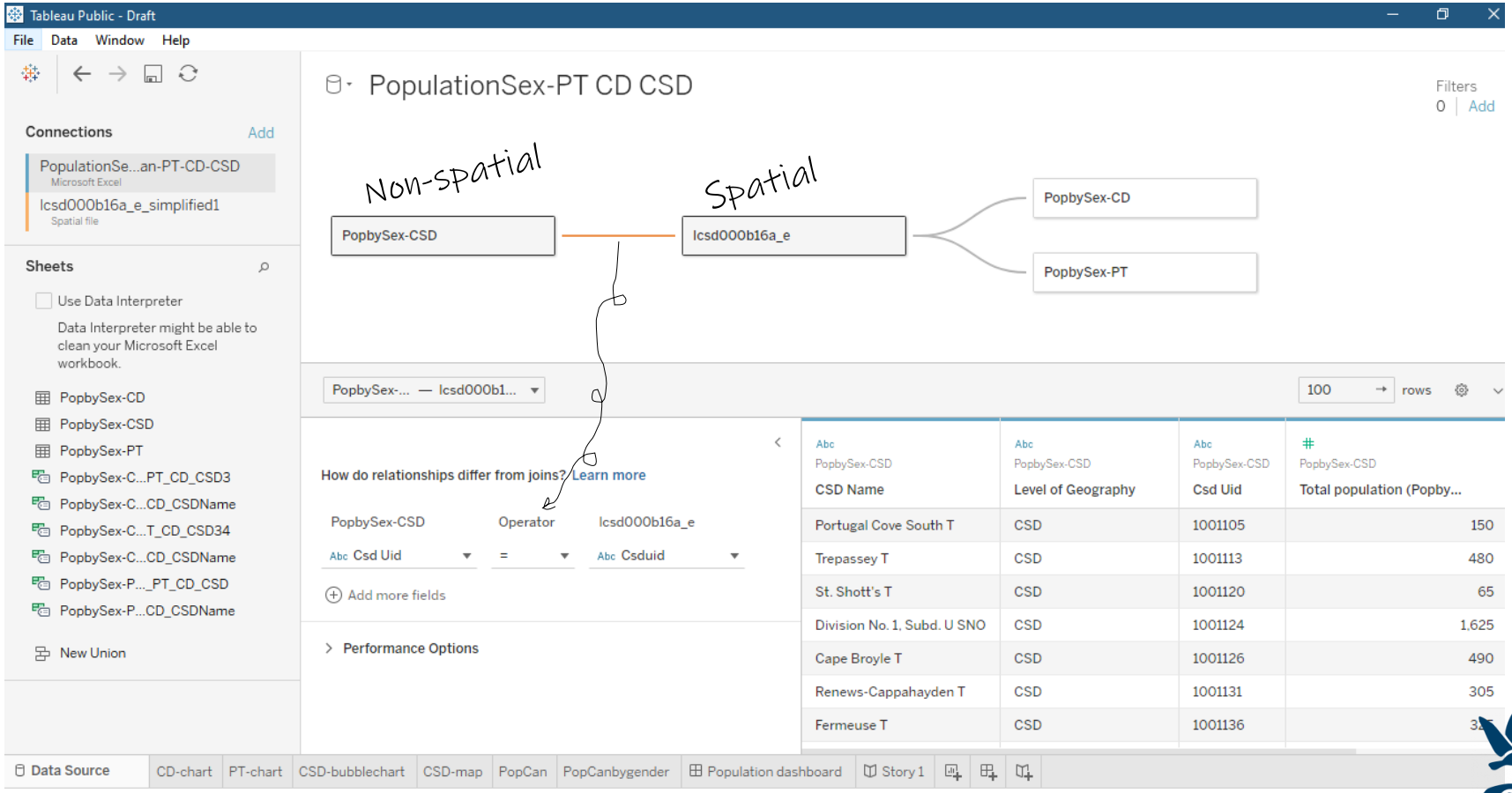
Add connections to Tableau Data Source

Setting up data source: relationships…



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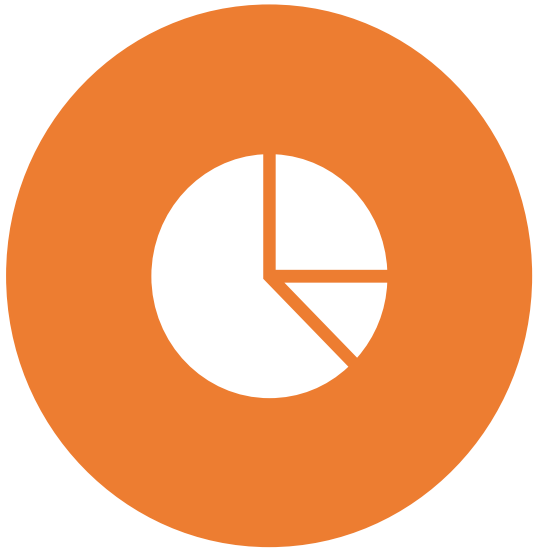
Creating charts and maps



Start Building a Visualization by Dragging Fields to the View:

The basic structure for every view is made of **dimension** and **measure** fields placed on the Rows and Columns shelves, and on different properties in the Marks card.

More information: https://help.tableau.com/v2021.3/public/desktop/en-us/buildmanual_dragging.htm

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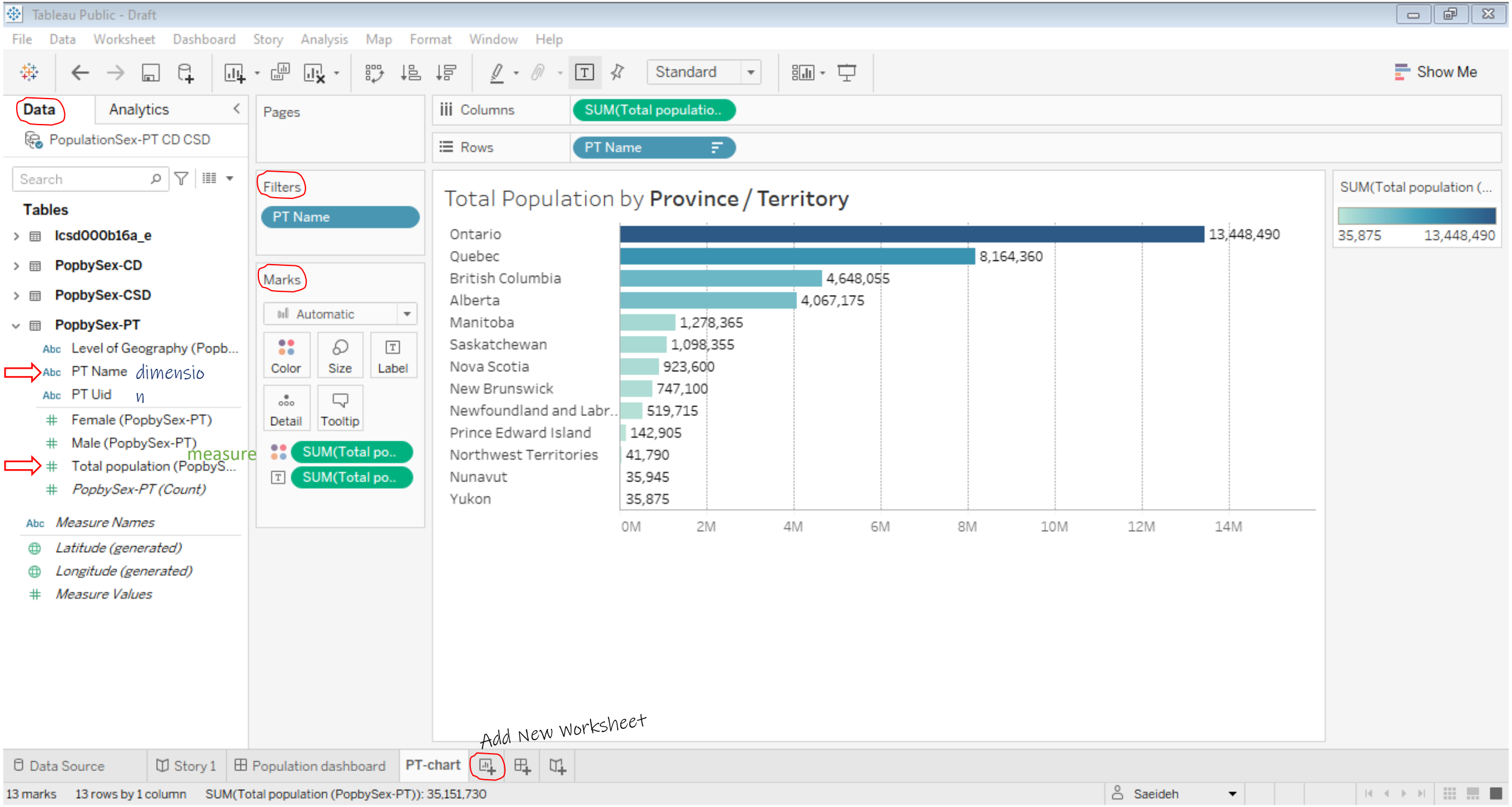


Tableau Public - Draft
File Data Worksheet Dashboard Story Analysis Map Format Window Help
Standard
Show Me
Data
Analytics
PopulationSex-PT CD CSD
Search
Tables
Icsd000b16a_e
PopbySex-CD
PopbySex-CSD
PopbySex-PT
Abc Level of Geography (Popb...
Abc PT Name
dimension
Abc PT Uid
Female (PopbySex-PT)
Male (PopbySex-PT)
measure
Total population (PopbyS...
PopbySex-PT (Count)
Abc Measure Names
Latitude (generated)
Longitude (generated)
Measure Values
Pages
Filters
PT Name
Marks
Automatic
Color
Size
Label
Detail
Tooltip
SUM(Total po..
SUM(Total po..
Columns
SUM(Total populatio..
Rows
PT Name
Total Population by Province / Territory
Ontario 13,448,490
Quebec 8,164,360
British Columbia 4,648,055
Alberta 4,067,175
Manitoba 1,278,365
Saskatchewan 1,098,355
Nova Scotia 923,600
New Brunswick 747,100
Newfoundland and Labr.. 519,715
Prince Edward Island 142,905
Northwest Territories 41,790
Nunavut 35,945
Yukon 35,875
0M 2M 4M 6M 8M 10M 12M 14M
SUM(Total population (...
35,875 13,448,490
Add New Worksheet
Data Source
Story 1
Population dashboard
PT-chart
13 marks
13 rows by 1 column
SUM(Total population (PopbySex-PT)): 35,151,730
Saeideh

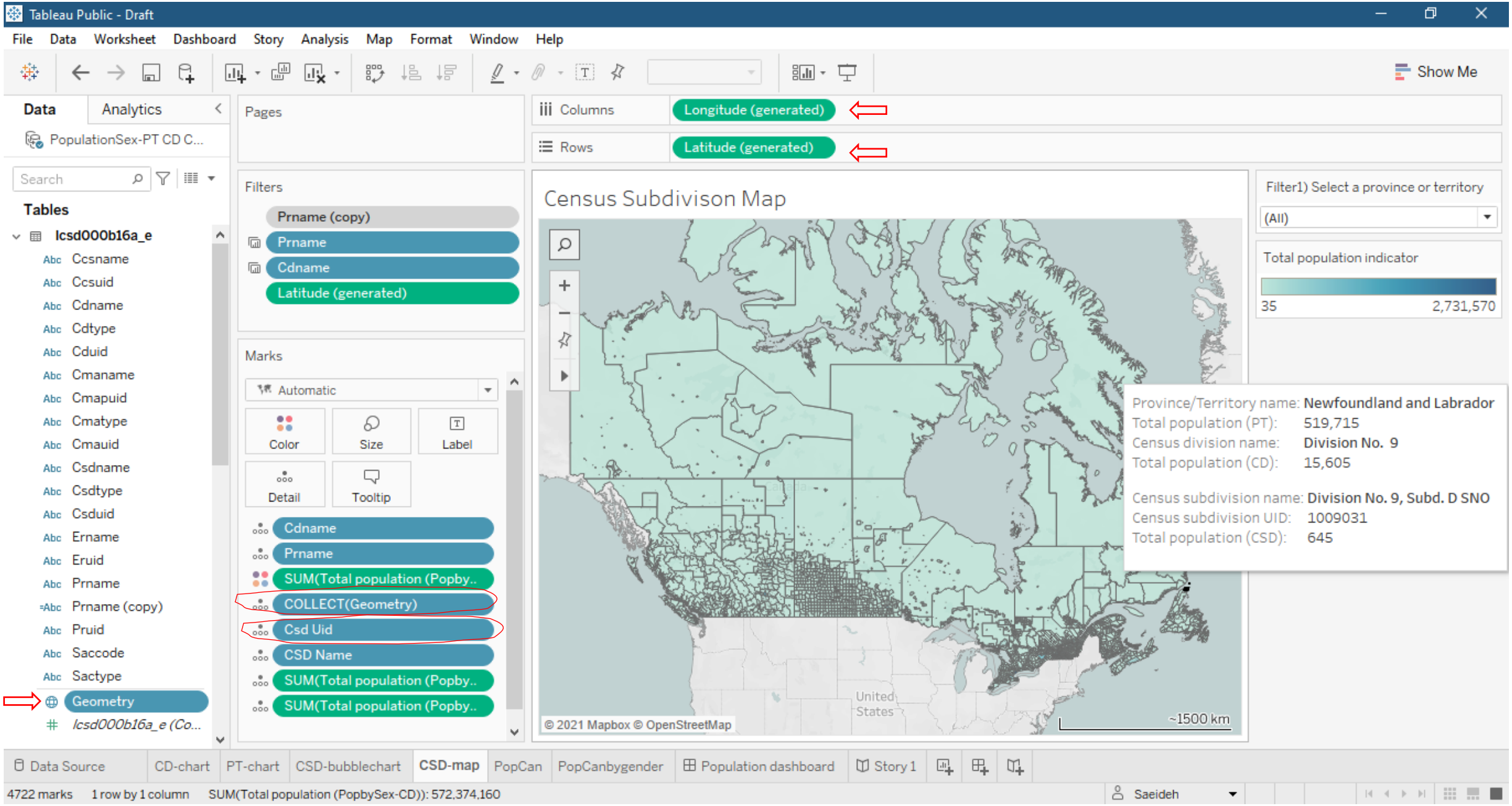
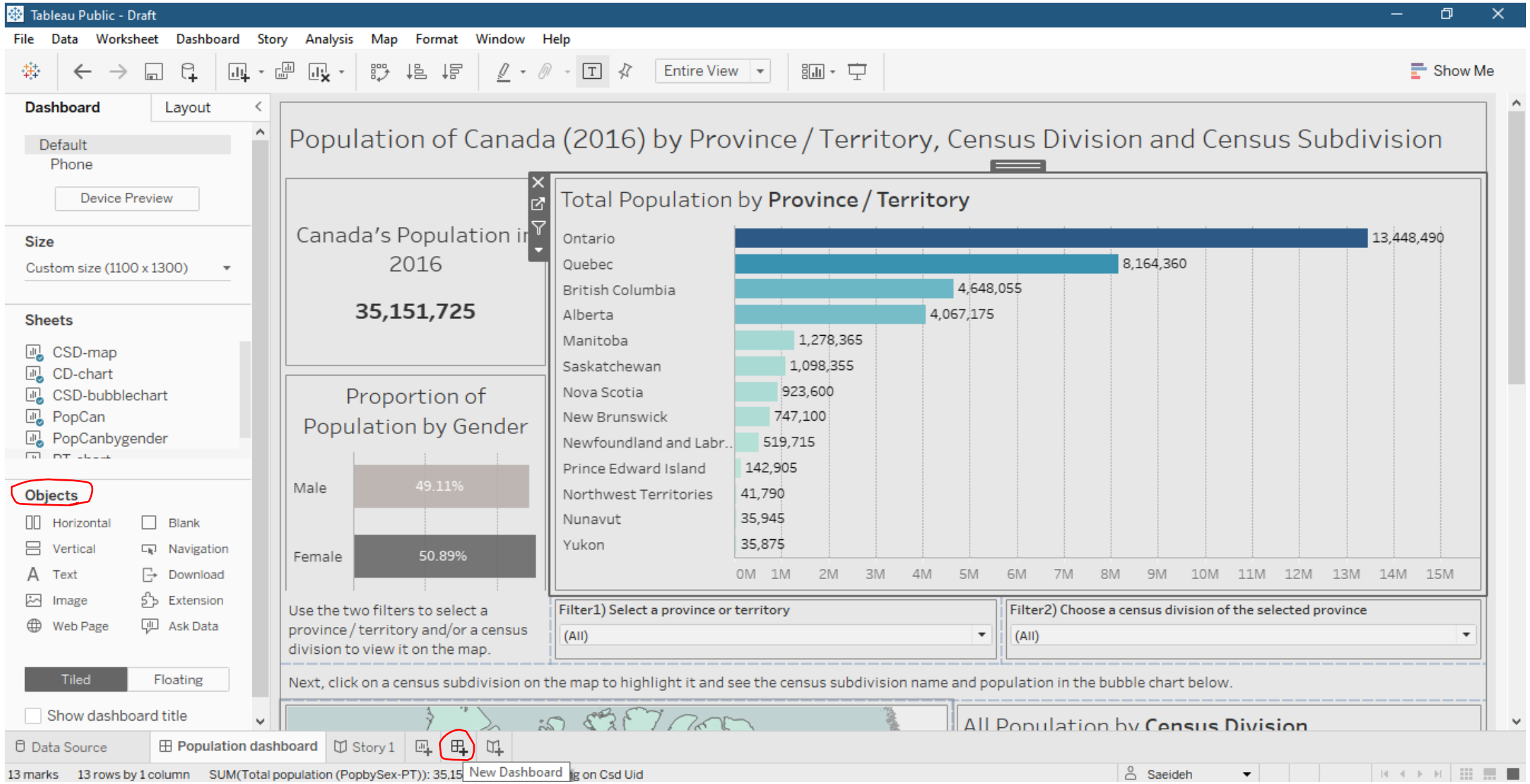


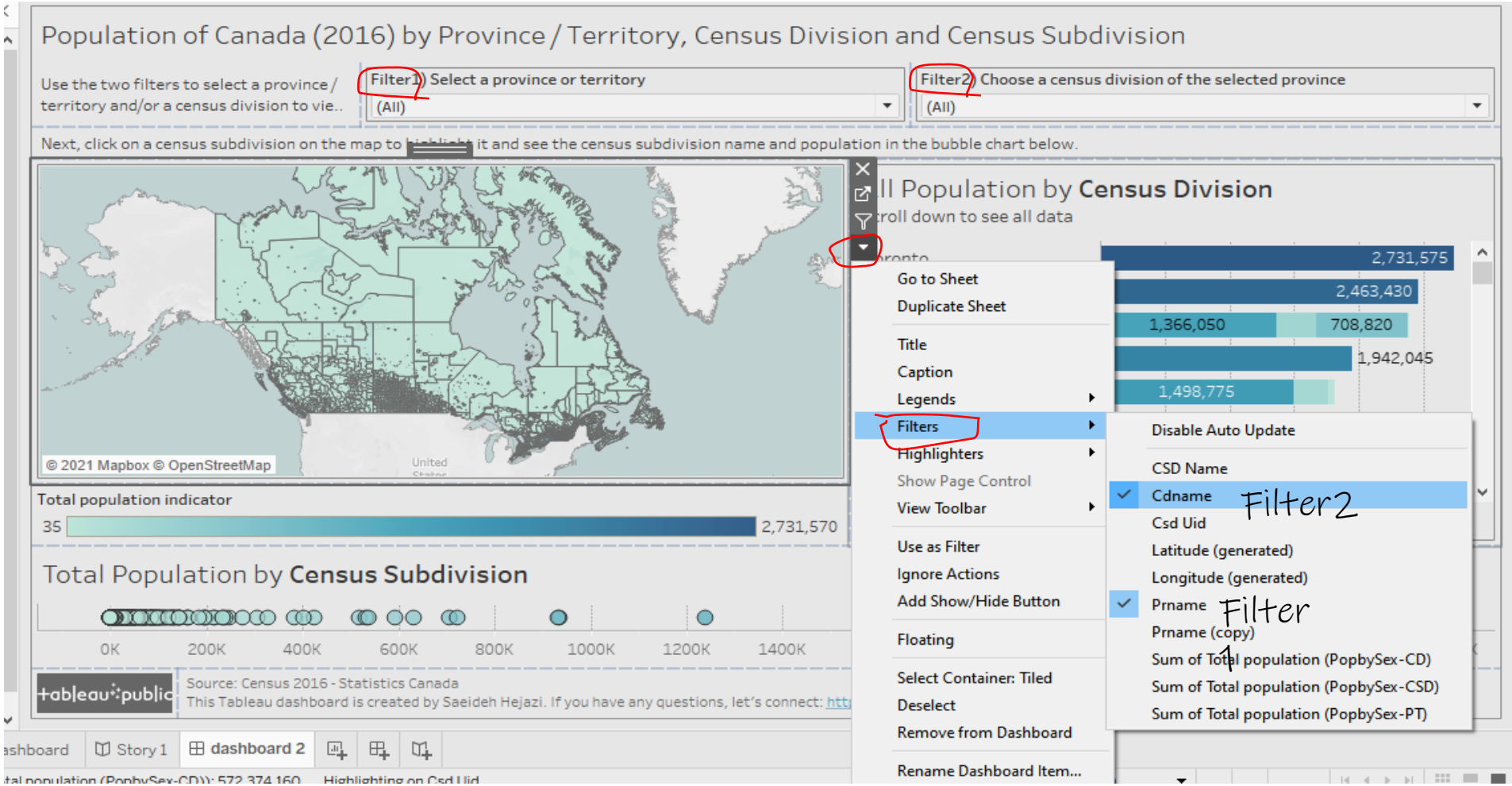
Tableau Public - Draft
File Data Worksheet Dashboard Story Analysis Map Format Window Help
Show Me
Data Analytics
PopulationSex-PT CD C...
Search
Tables
lcsd000b16a_e
Abc Ccsname
Abc Ccsuid
Abc Cdname
Abc Cdtype
Abc Cduid
Abc Cmaname
Abc Cmapuid
Abc Cmatype
Abc Cmauid
Abc Csdname
Abc Csdtype
Abc Csduid
Abc Ername
Abc Eruid
Abc Prname
=Abc Prname (copy)
Abc Pruid
Abc Saccode
Abc Sactype
Geometry
lcsd000b16a_e (Co...
Pages
Columns
Longitude (generated)
Rows
Latitude (generated)
Filters
Prname (copy)
Prname
Cdname
Latitude (generated)
Marks
Automatic
Color
Size
Label
Detail
Tooltip
Cdname
Prname
SUM(Total population (Popby..
COLLECT(Geometry)
Csd Uid
CSD Name
SUM(Total population (Popby..
SUM(Total population (Popby..
Census Subdivison Map
United States
© 2021 Mapbox © OpenStreetMap
~1500 km
Filter1) Select a province or territory
(All)
Total population indicator
35
2,731,570
Province/Territory name: Newfoundland and Labrador
Total population (PT): 519,715
Census division name: Division No. 9
Total population (CD): 15,605
Census subdivision name: Division No. 9, Subd. D SNO
Census subdivision UID: 1009031
Total population (CSD): 645
Data Source
CD-chart
PT-chart
CSD-bubblechart
CSD-map
PopCan
PopCanbygender
Population dashboard
Story 1
4722 marks
1 row by 1 column
SUM(Total population (PopbySex-CD)): 572,374,160
Saeideh

Designing dashboards and storyboards



Design dashboard and storyboard

Add interactivity: Filters



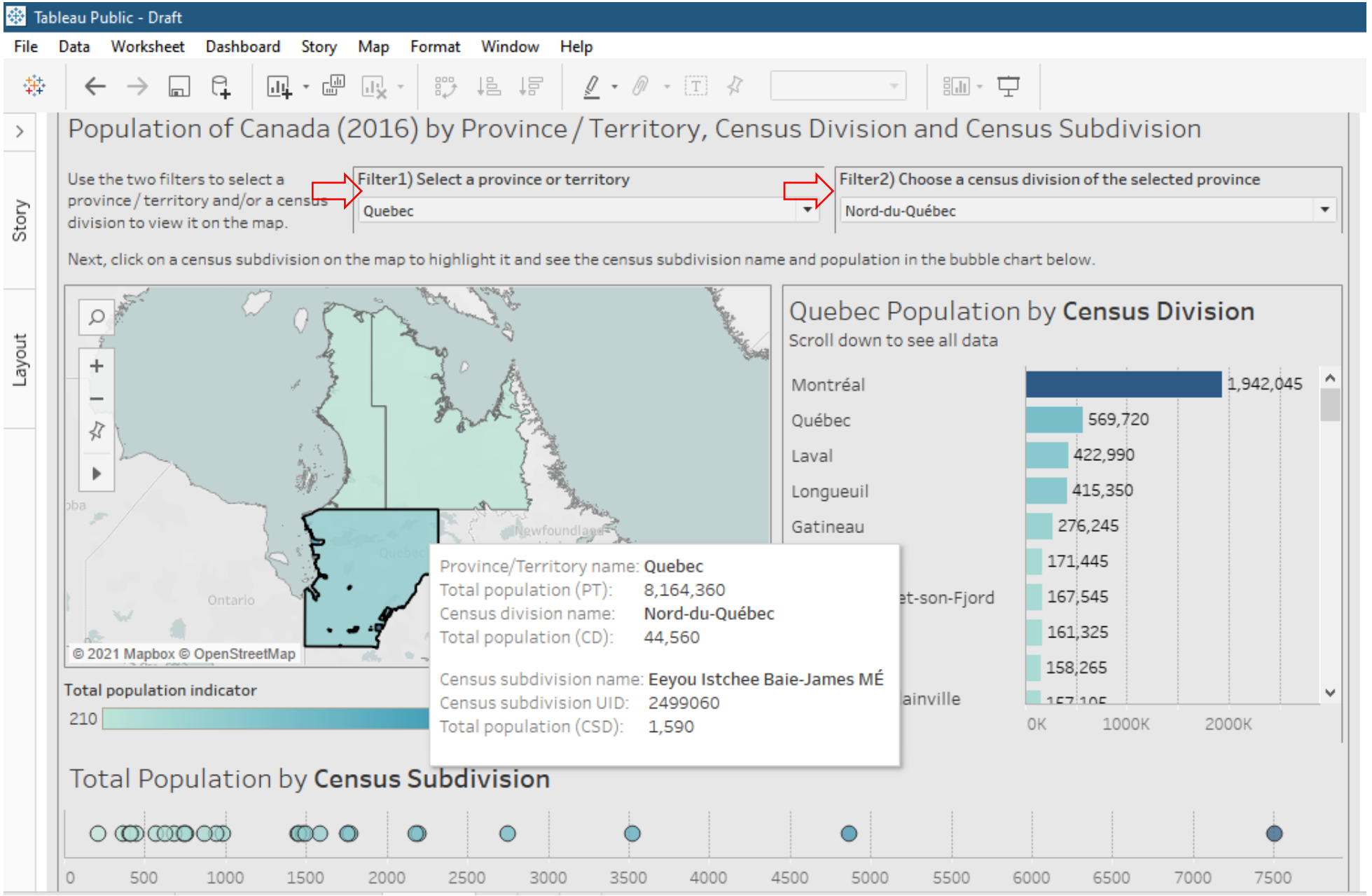
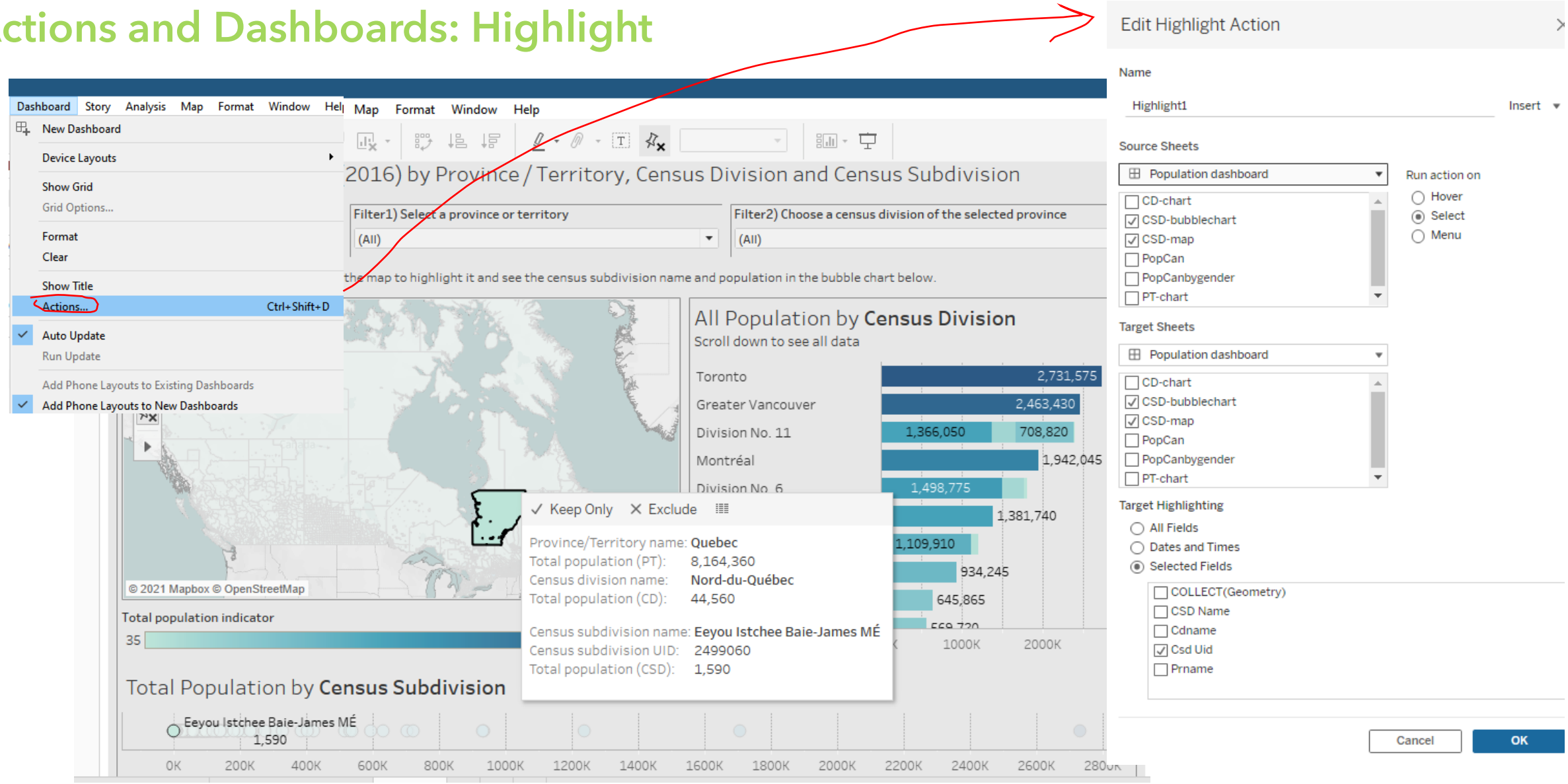


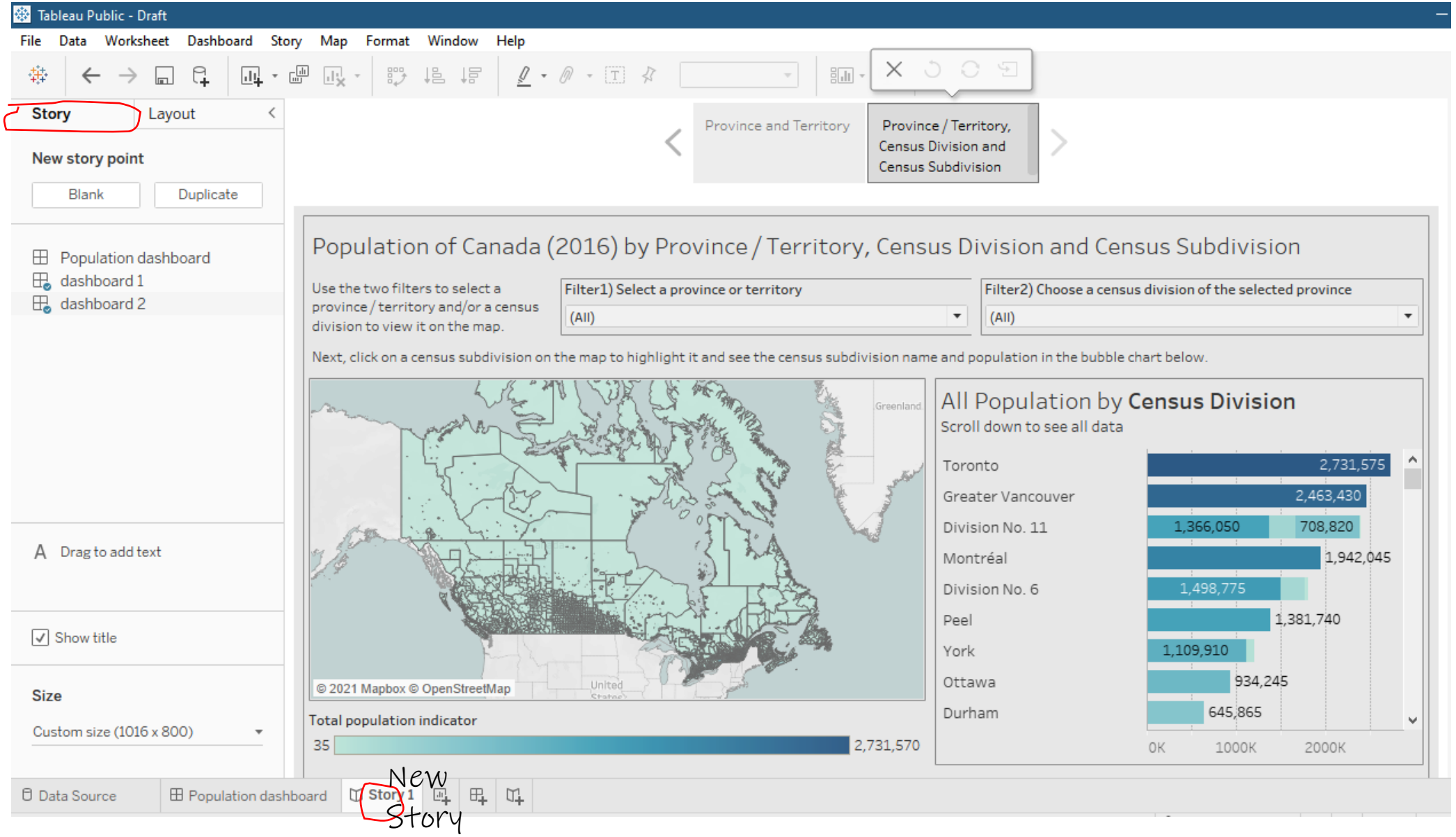
Tableau Public - Draft
File Data Worksheet Dashboard Story Map Format Window Help
Story
Layout
Population of Canada (2016) by Province / Territory, Census Division and Census Subdivision
Use the two filters to select a province / territory and/or a census division to view it on the map.
Filter1) Select a province or territory
Quebec
Filter2) Choose a census division of the selected province
Nord-du-Québec
Next, click on a census subdivision on the map to highlight it and see the census subdivision name and population in the bubble chart below.
© 2021 Mapbox © OpenStreetMap
Province/Territory name: Quebec
Total population (PT): 8,164,360
Census division name: Nord-du-Québec
Total population (CD): 44,560
Census subdivision name: Eeyou Istchee Baie-James MÉ
Census subdivision UID: 2499060
Total population (CSD): 1,590
Total population indicator
210
Quebec Population by Census Division
Scroll down to see all data
Montréal 1,942,045
Québec 569,720
Laval 422,990
Longueuil 415,350
Gatineau 276,245
171,445
167,545
161,325
158,265
0K 1000K 2000K
Total Population by Census Subdivision
0 500 1000 1500 2000 2500 3000 3500 4000 4500 5000 5500 6000 6500 7000 7500

Designing dashboards and storyboards

Actions and Dashboards: Highlight



Design dashboards and storyboards



Thank you!

Questions?

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