BUS 5100 Term Project Tutorial

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Instructor: Jongwook Woo

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Lab Tutorial

Group #5

Registered EV In State of Washington

Data Analysis using SAC

Objectives

List your objectives. In this hands-on lab, you will learn how to:

- Select and download using Dr. Woo's approved list of data sources
- Examine the data and determine relevant fields before loading to SAC
- Load data to SAC, save to file location, and then concatenate the data as well as add dimension attributes as part of the modeler.
- Create stories using responsive pages
- Visualization of data to produce screenshots to generate Term Paper

Section 1: Get Data Manually and Prep Data

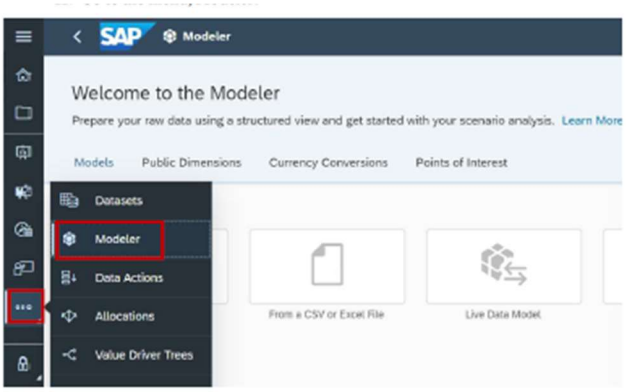
1. Identify data source from Dr. Woo's provided URLs. Group #5 selected registered EVs in the state of Washington. https://catalog.data.gov/dataset/electric-vehicle-population-data
2. Review the dataset in Excel. Remove column headings not relevant to the project based upon what we will analyze in order to determine the relationship between the dataset we will include for upload to SAP. The following column headings were removed prior to uploading to SAP:

VIN	Base MSRP (some values '0')	Legislative District
DOL Vehicle	Electric Range (some values '0')	2020 Census Tract

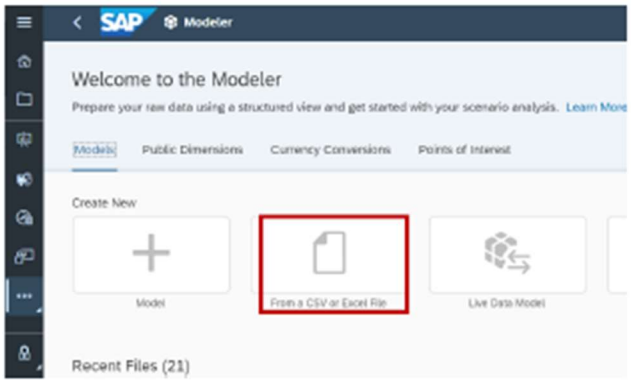
3. Open a web browser and go to SAP Analytics Cloud (SAC): https://highereducation.us10.sapanalytics.cloud/.

Section 2: Creating the Model and Validate Data

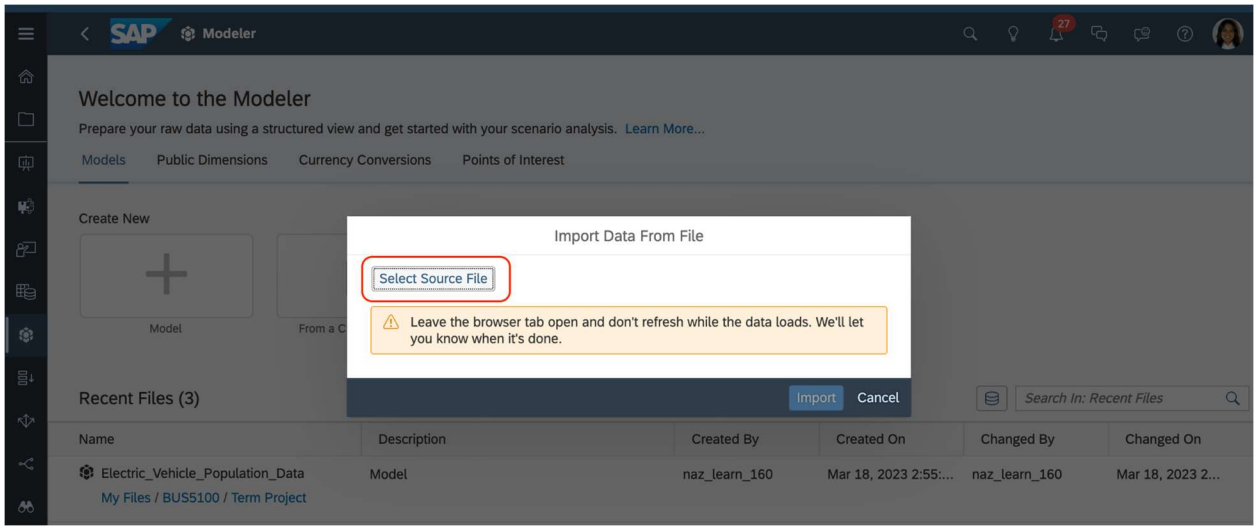
1. If you move your mouse pointer over the menu "**…**" at the left navigator, you can select "**Modeler**".



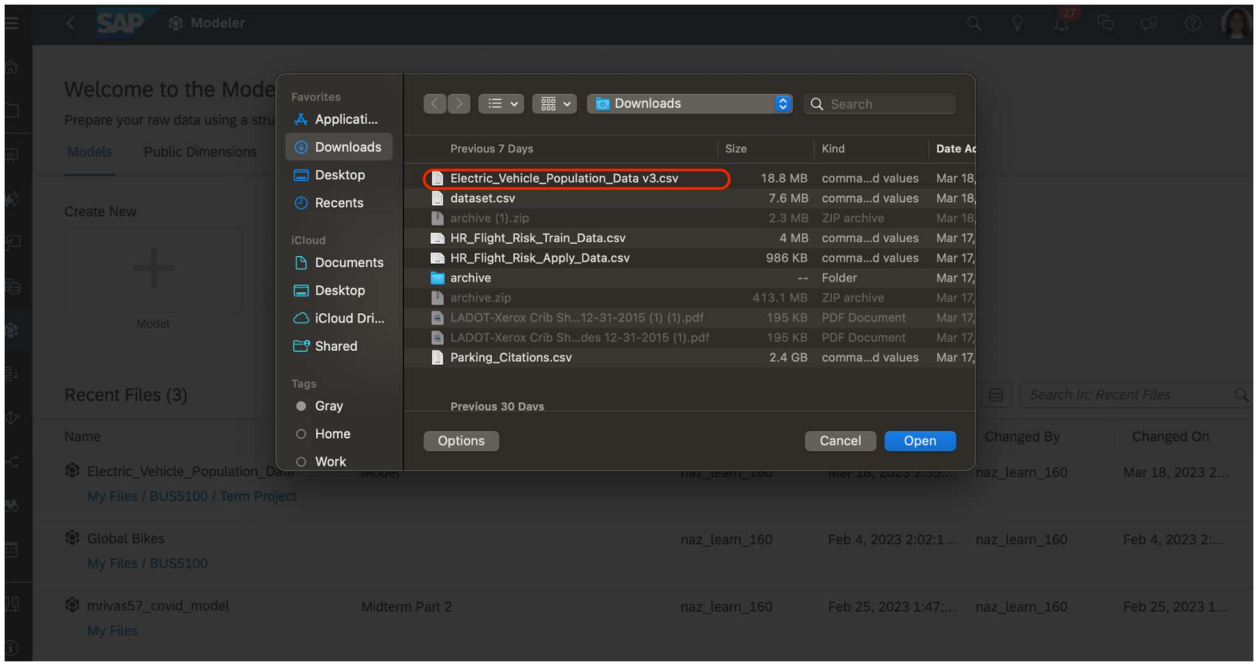
2. Choose **From a CSV or Excel File**.



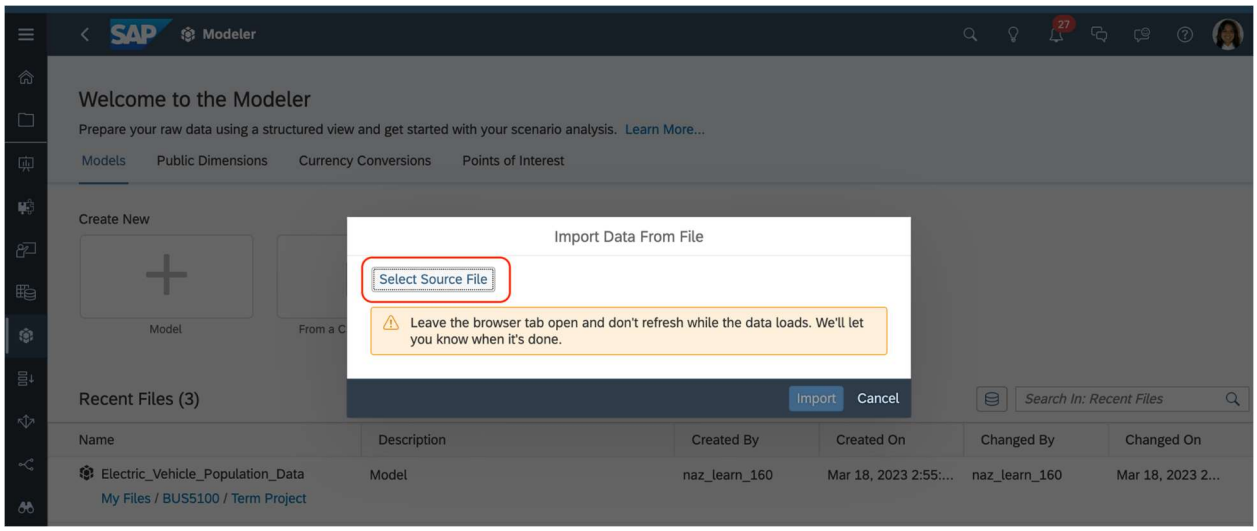
3. Then, click **Select Source File**.



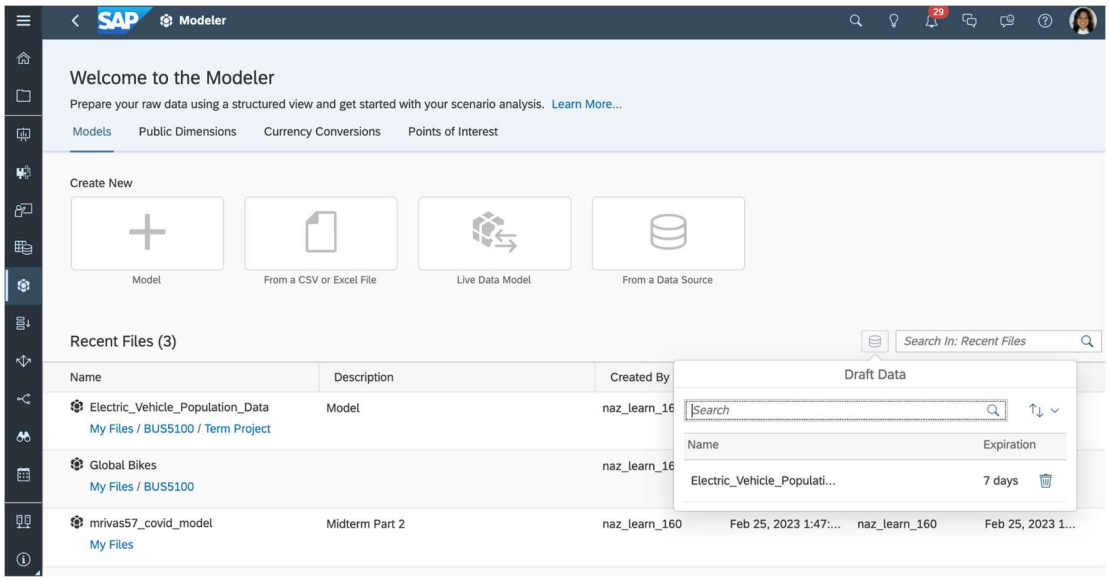
4. Select the excel file **Electric_ Vehicle_Population_ Data_v3** to open it.



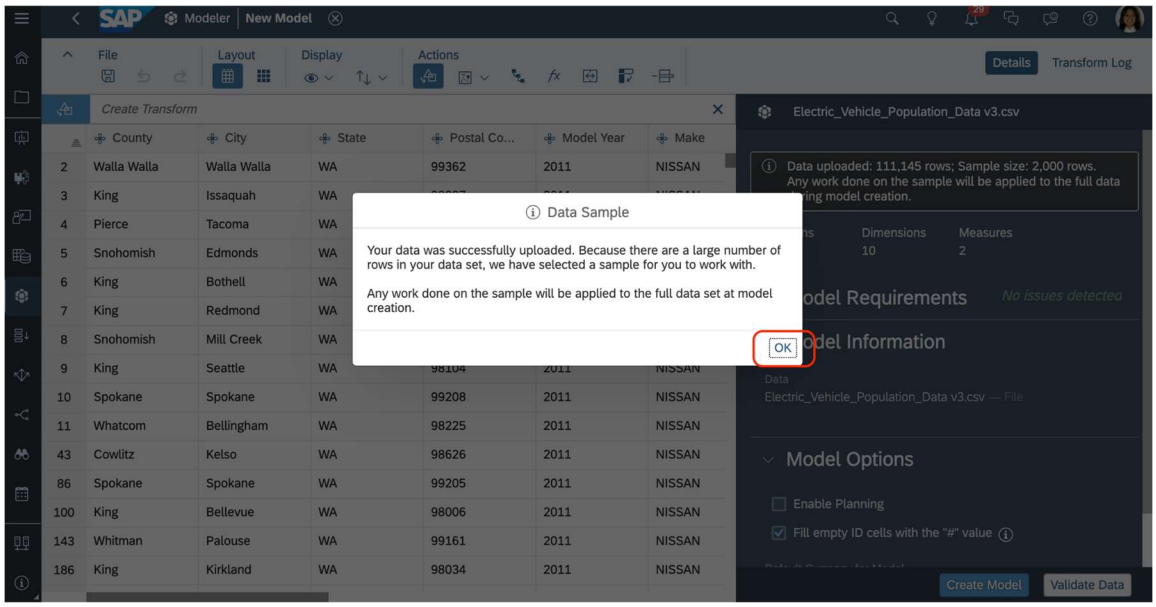
5. "**Use the first row as column headers**" should be selected as default. Select the model "**Electric_ Vehicle_Population_ Data_v3**" and import.



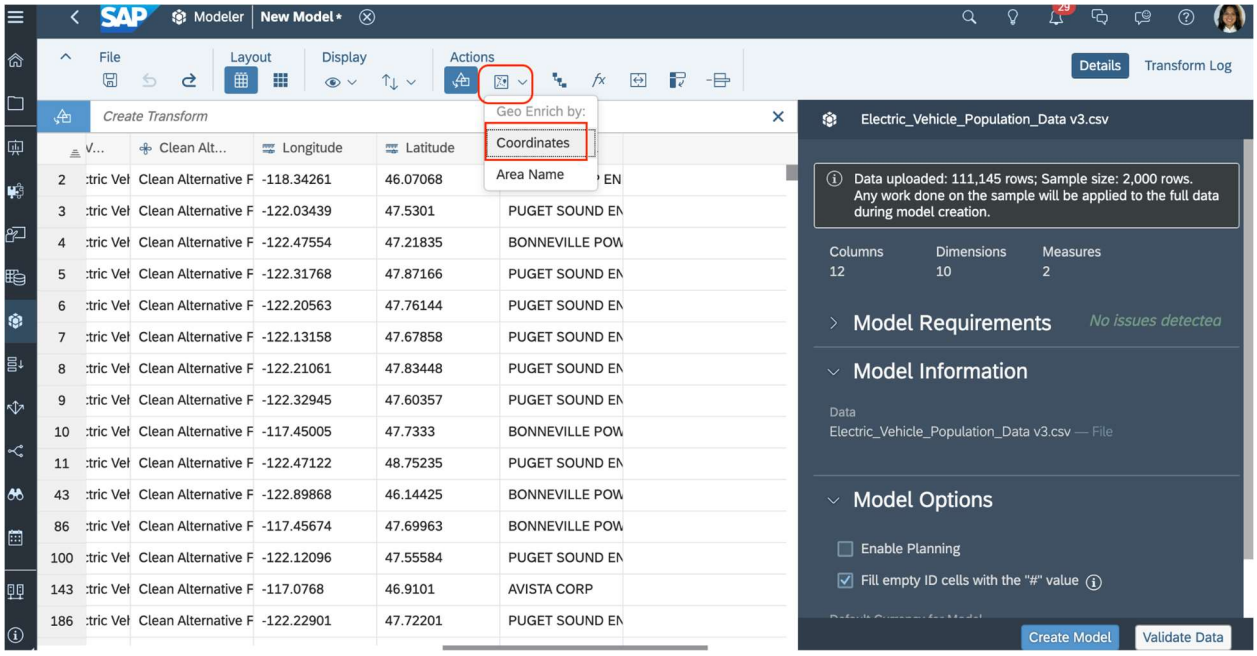
6. After 1 - 2 minutes, a message and notification in the top right corner will say "Electric_ Vehicle_Population_ Data_v3 data upload has completed successfully". Select the **draft data icon** and click on the data file "**Electric_ Vehicle_Population_ Data_v3**" in the draft data menu. NOTE: You can find the file with the search icon.



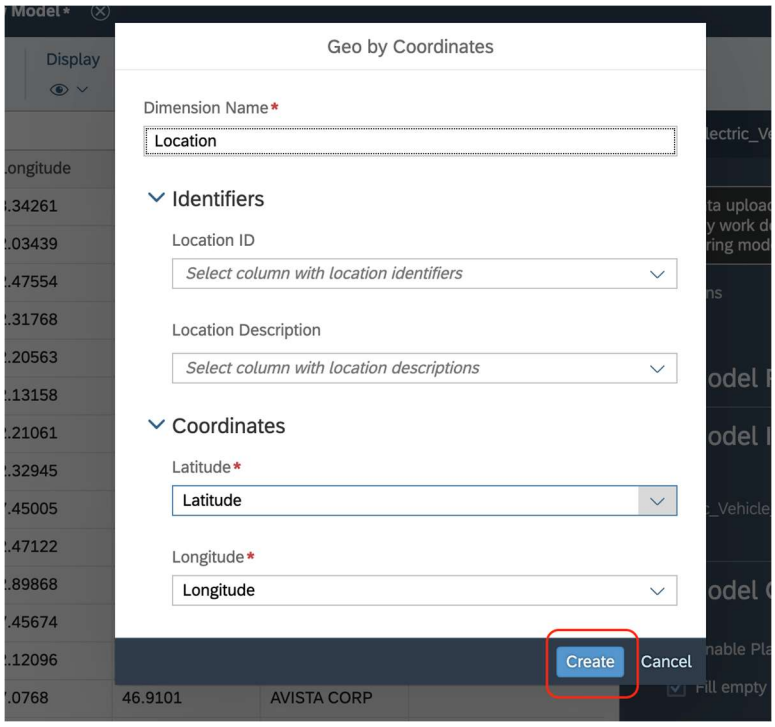
7. You will receive a message that only a sample of the data will be shown. Click **OK** to acknowledge the message. Then, select the **save icon** in the menu top left. NOTE: You need to save the model when you do each step to not lose any update.



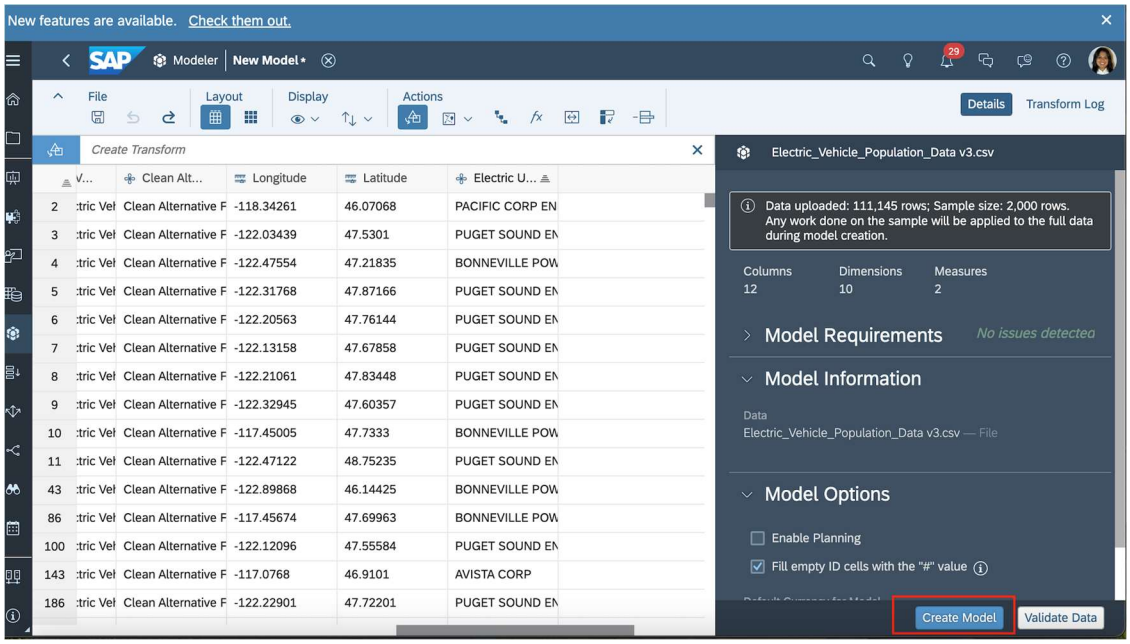
8. Now you will see the data and a window with "**Create Model**" and "**Validate Data**". You will then select **Geo Enrich > Coordinates**.



9. You will then click **Create**.

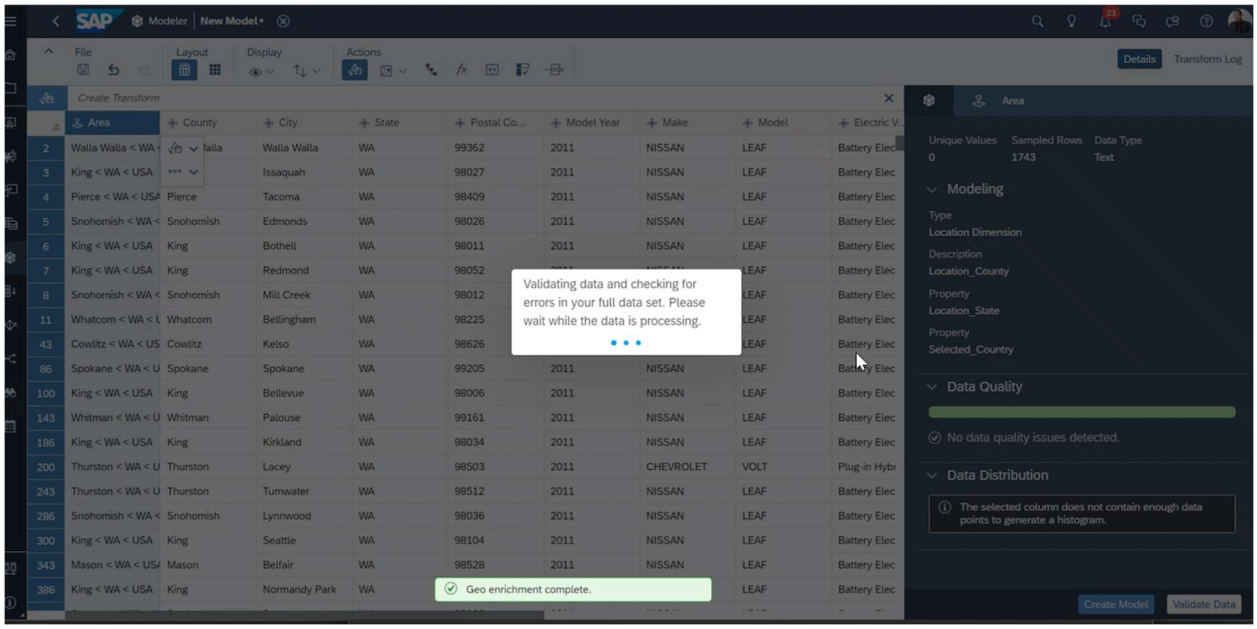


10. Now you will see the data and a window with "**Create Model**" and "**Validate Data**".



11. Create the model.

a. Select **Create Model**. It may take time to validate the data.
b. You will be asked if you are finished mapping and editing. Click **Create**.

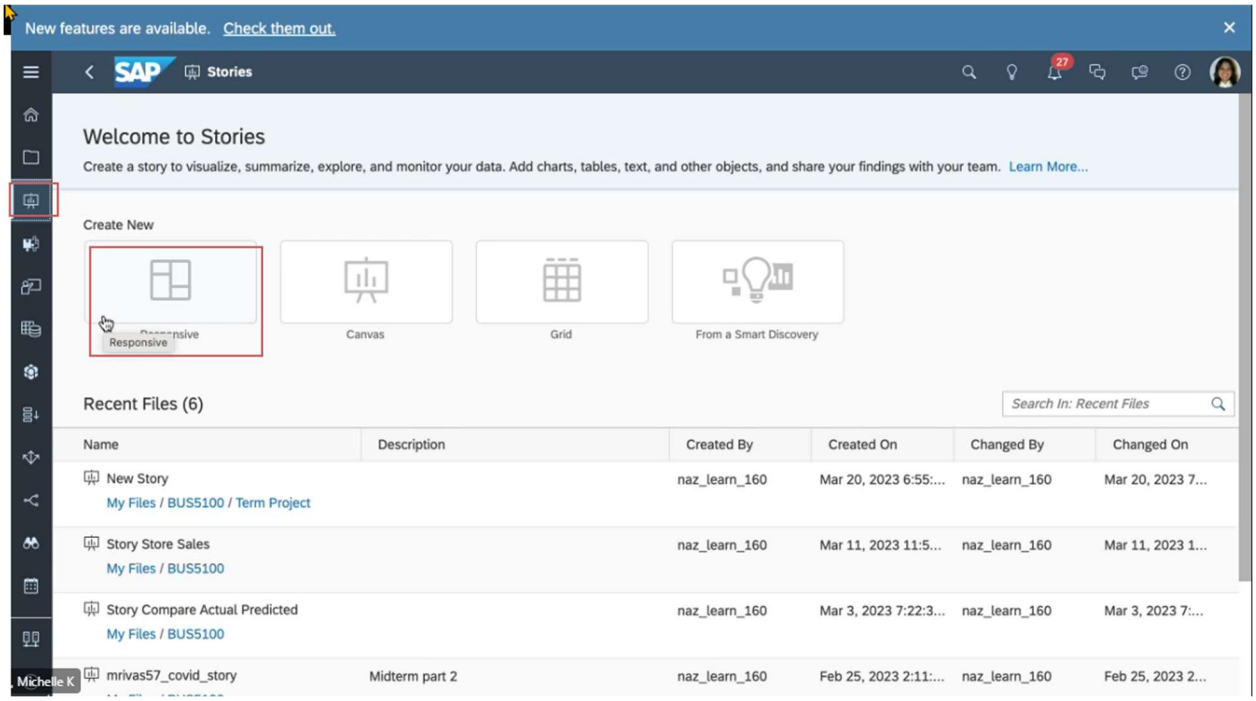


c. Give the model a meaningful name, e.g. “Electrical Vehicles” and **save the model** to your folder. For example, **My Files > BUS5100**. NOTE: You created this folder at the step . Click your folder and save the model.

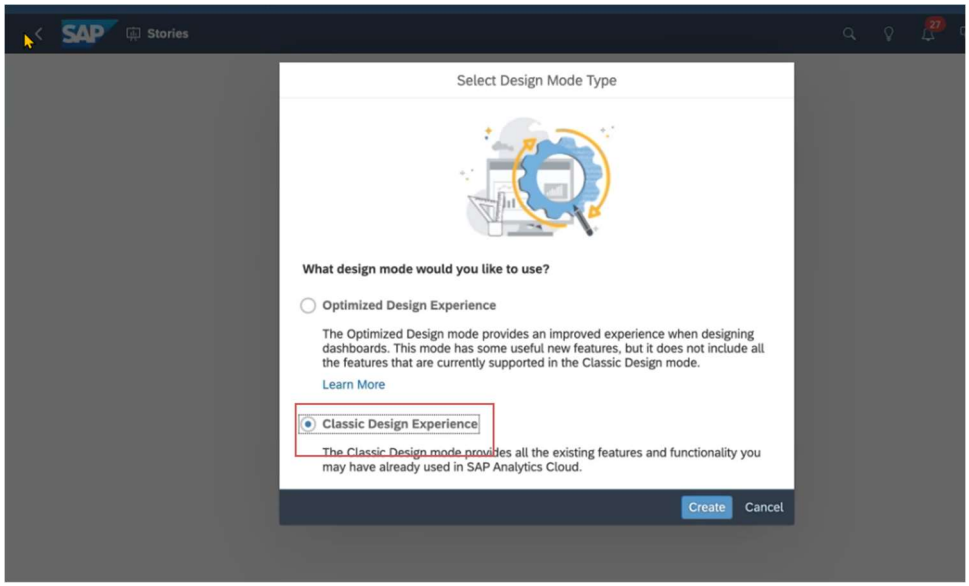
Section 3: Acquire Data and Start the Story

Visualizations within the stories are created as either responsive pages or canvas pages. Responsive pages can be presented in various formats – they will adapt to the screen size. If you expect to present the story on various devices, perhaps on a phone or in a boardroom with big screens, then you would want to choose Responsive Pages.

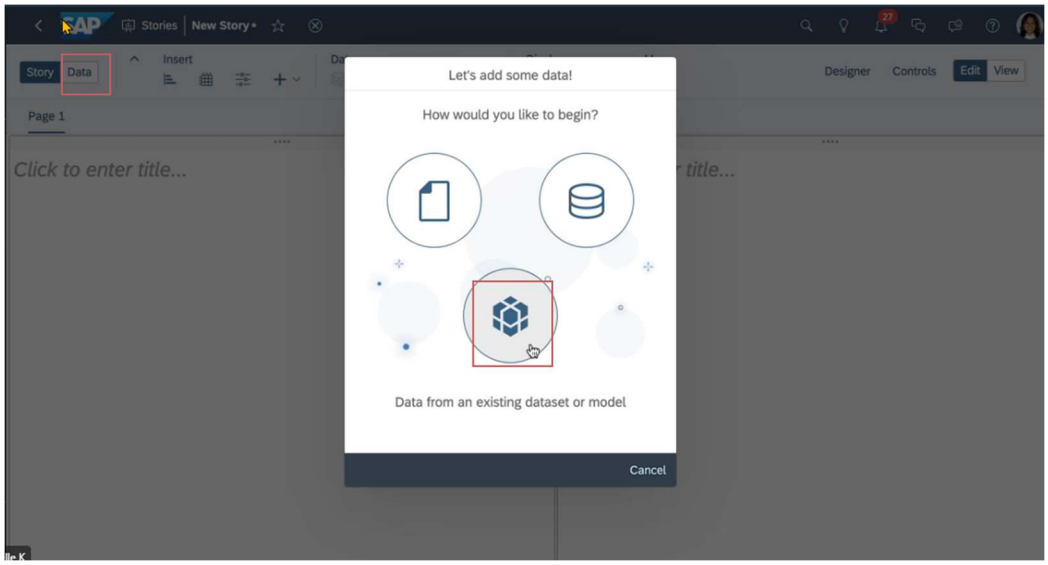
1. Select **Stories** from the menu on the left side of the screen. Then, select Create New **Responsive Page.**



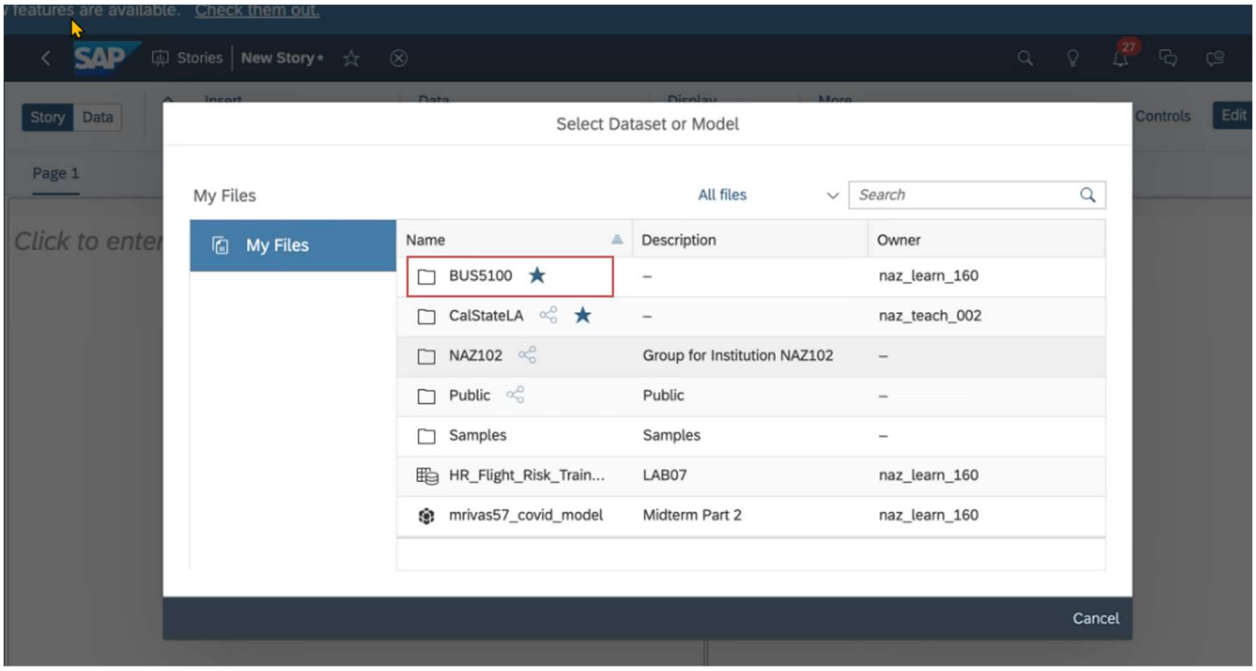
2. You will see the following screen. Select **Classic Design Experience**.



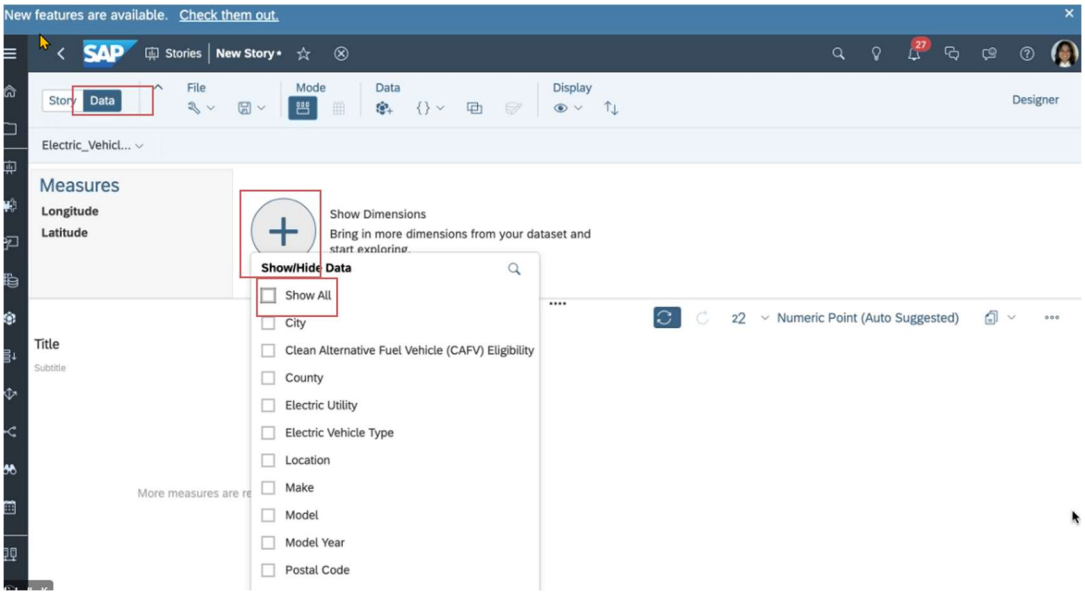
3. Data for a story may be acquired via a live connection, importing of a data source(s), or data that has already been modeled in SAC. We will use the **Electric_Vehicle_Population_ Data model**. Click the **Data tab** on the Responsive Page at the upper left corner of the canvas. Then, choose **Data from an existing dataset or model**.



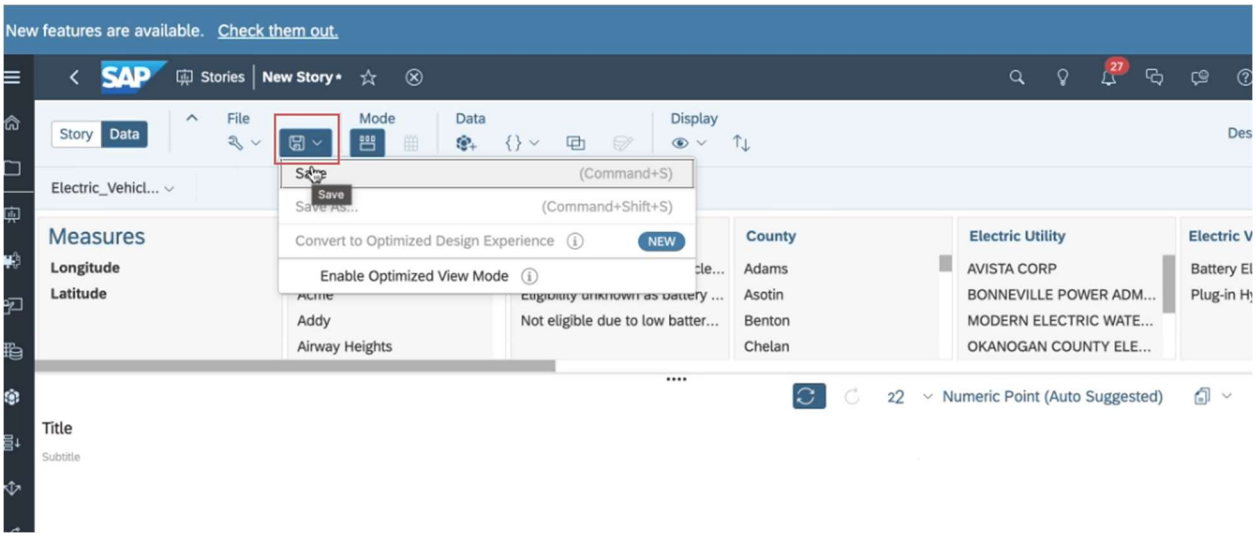
4. Select the **Electric_Vehicle_Population_Data model** that you created in the previous lab. Most likely it is stored in your class folder. For example, **My Files > BUS5100 > Term Project> Electric_Vehicle_Population_ Data.**



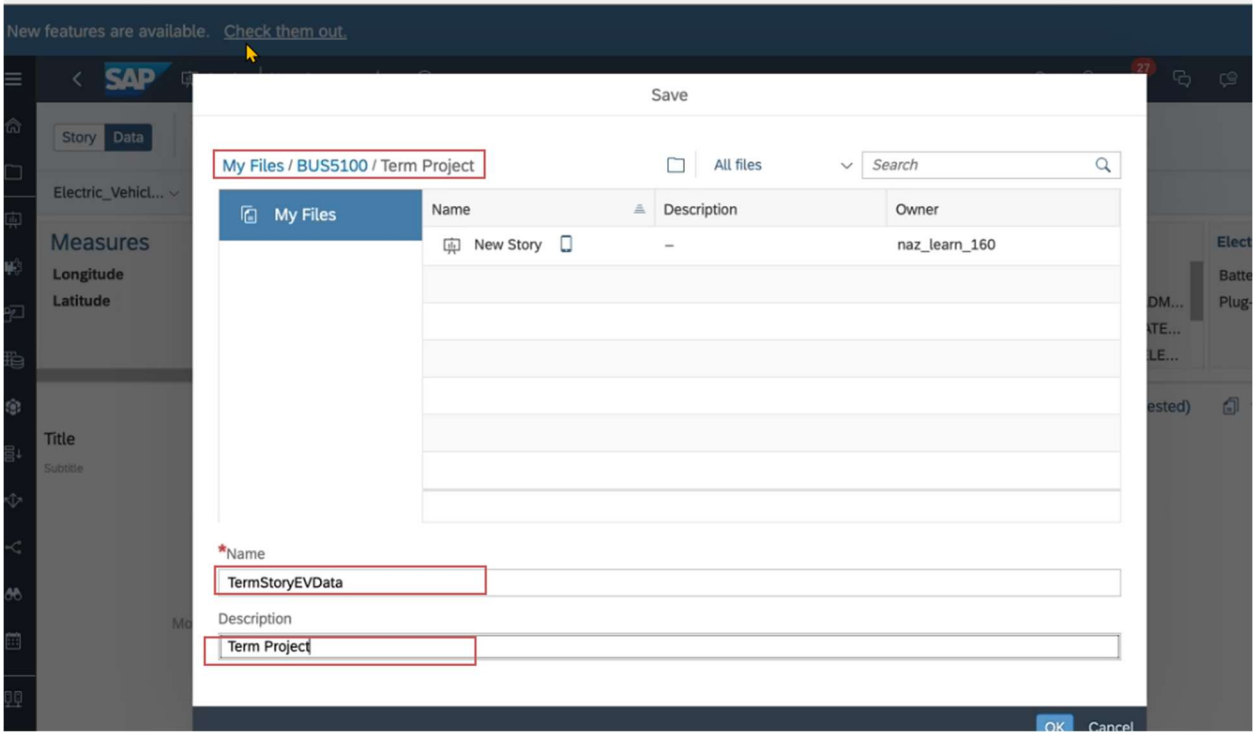
5. Select "**+**" and "**Show All**" Dimensions.



6. Save your Story as **TermStoryEVData** in your class folder. Path: **My Files > BUS5100 > Term Project > TermStoryEVData**.

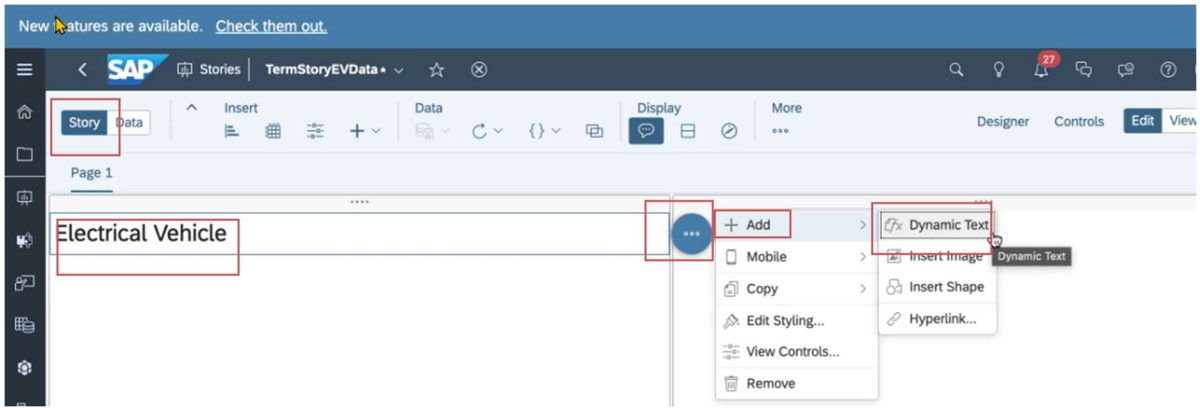


7. You may wish to **save** your story periodically and of course, after you finish it. SAC will actually warn you if you try to exit without saving. If the system asks you if you want to save or remove the model, choose save.

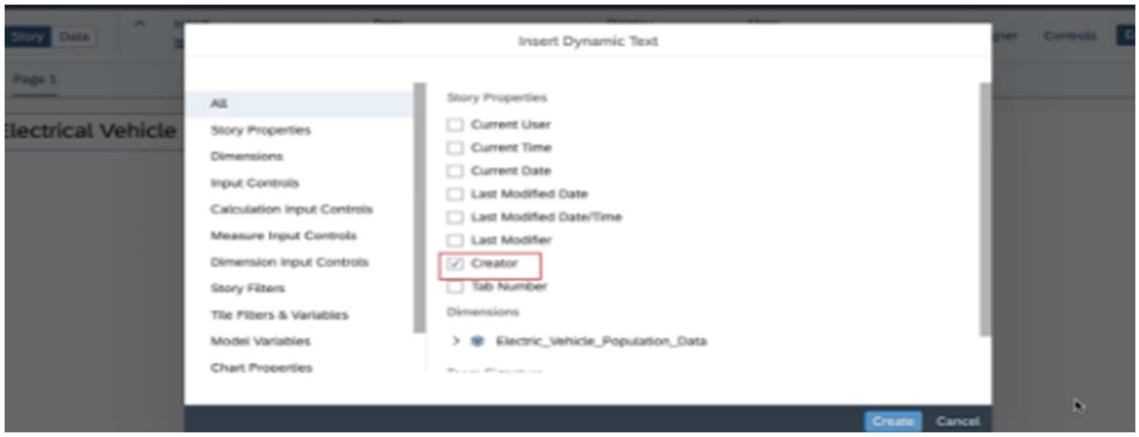


Section 4: Create a Geo-Map Page of EV Locations in Washington

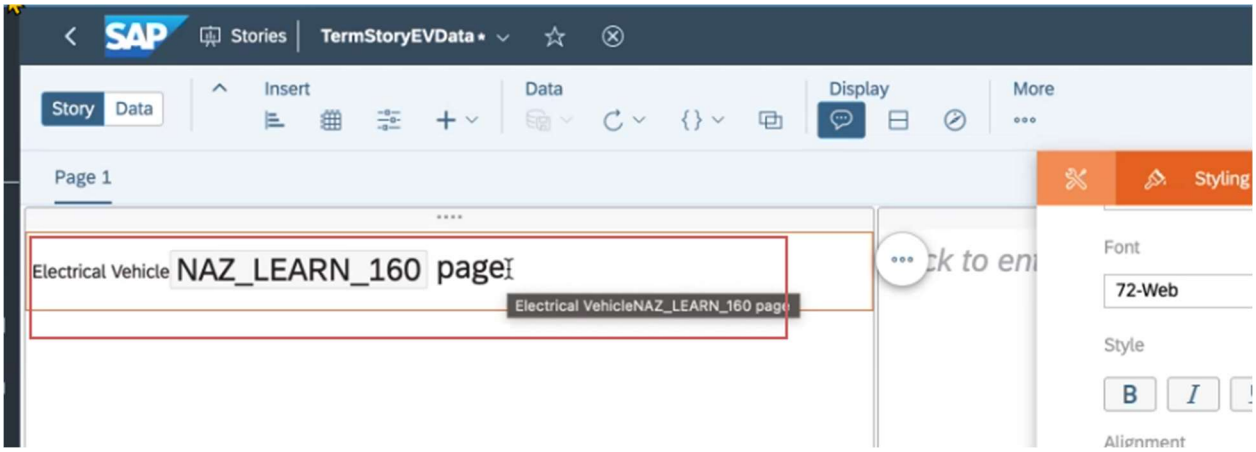
1. Go to the **Story Tab**. (The Story Tab is in the upper left corner, see figure below)
    a. The default view for a responsive page is two lanes arranged vertically as two frames. Lanes are used to organize content on multiple devices. If you were to create a canvas page, you would not see lanes.
    b. Each lane can have its own style.
2. You can add or delete lanes as you see fit.
3. On one of the lanes, click inside the title box to add a title **"Electrical Vehicle**"; See the below figure. (There should be a space after Electrical.)
    a. To add text to the title that is generated by the story page, we use **Add Dynamic Text** from the "**…**" (More) choice on the chart actions drop down list shown in the figure below. Select **Add > Dynamic Text**.



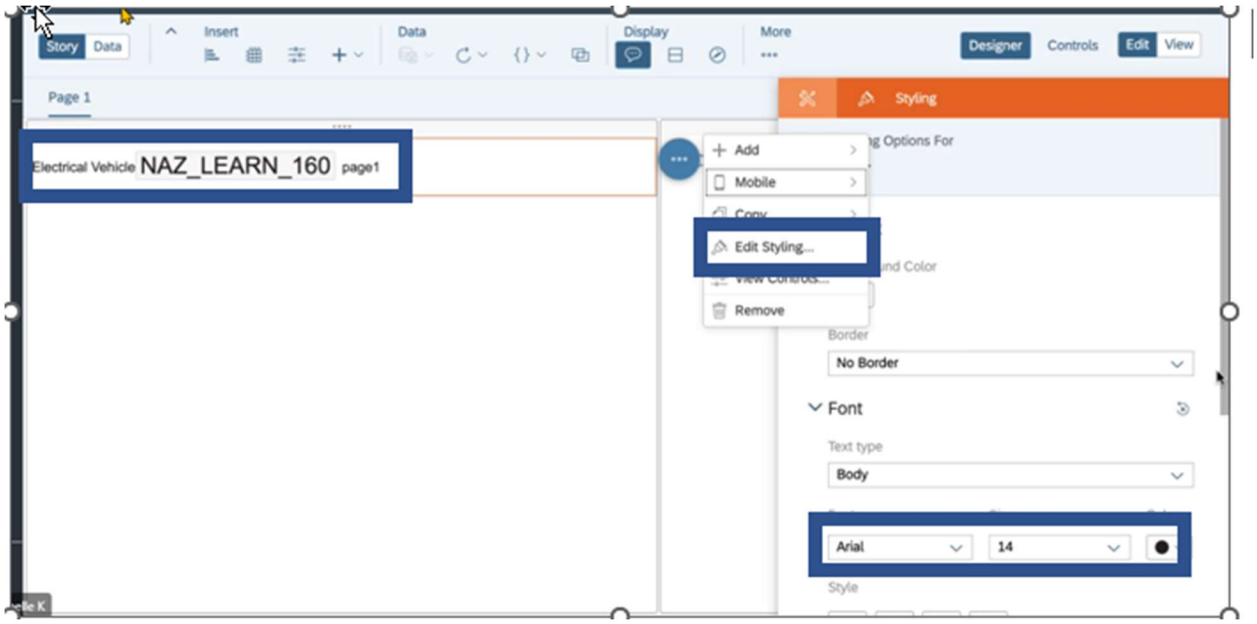
    b. On the **Insert Dynamic Text** Story Properties, choose **Creator** and select "**Create**". The dynamic text creator is illustrated below. Notice that there are several choices as to what you would like to insert and where in your story page you would like to insert the text. Ours is a simple insertion of who created the story into the title.



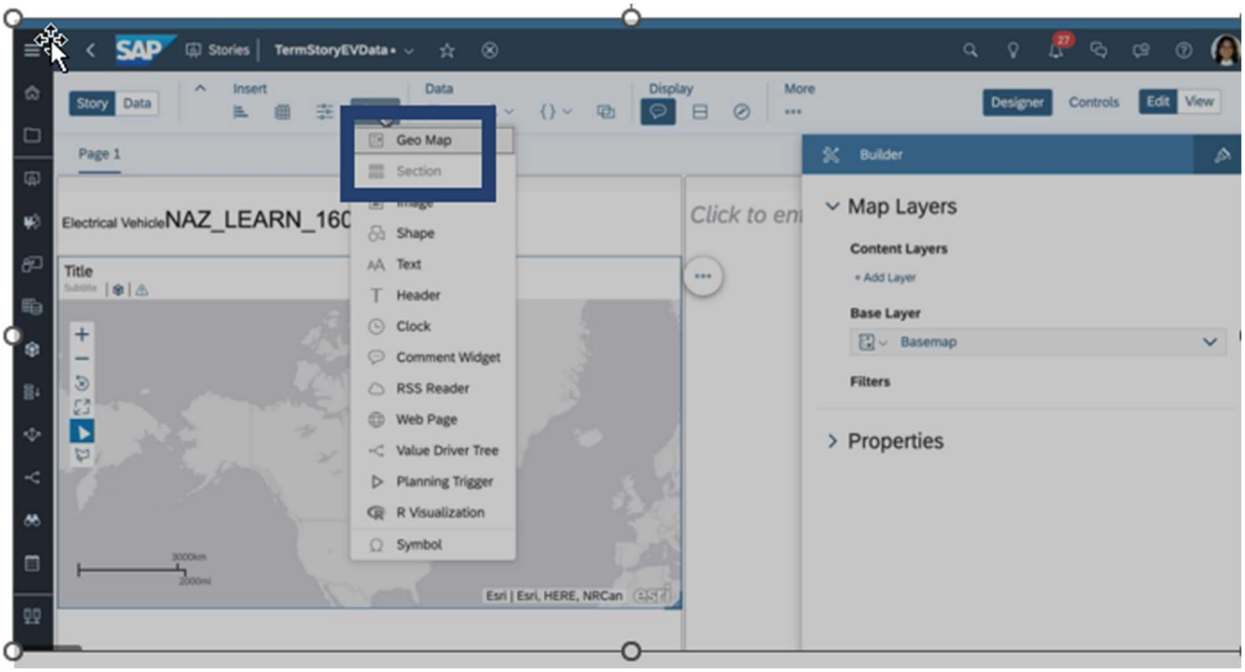
c. Once you have inserted **Creator** into the title, enter a space, the word "**page**" and click **insert dynamic text Page Number**.



d. Select the tile (and/or the page). Then, select "**Edit Styling**" as shown in the photo below. Perhaps change the font or color, add a background or borders.



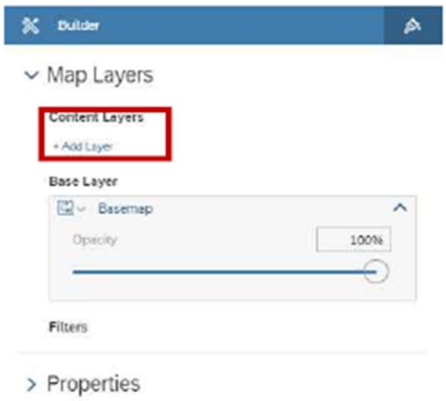
4. Insert a **Geo Map** by choosing the **Insert +** option and choosing **Geo Map** from the drop down list of options.



5. On the **Designer Builder panel** to the right of the chart and lanes, choose **Basemap**.

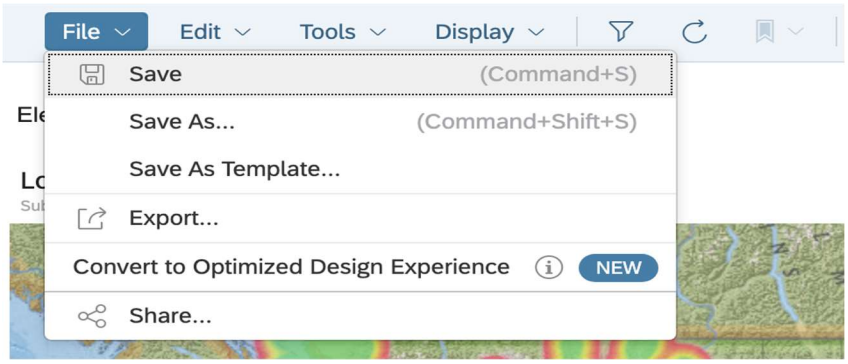
    a. Choose the style of the background, "**base map**" for your visualization. You could choose any from the base map: Streets, Satellite, …

6. Under **Content Layer** select **+ Add Layer > Bubble Layer**.



7. Designer/Builder Panel for a Geo Map

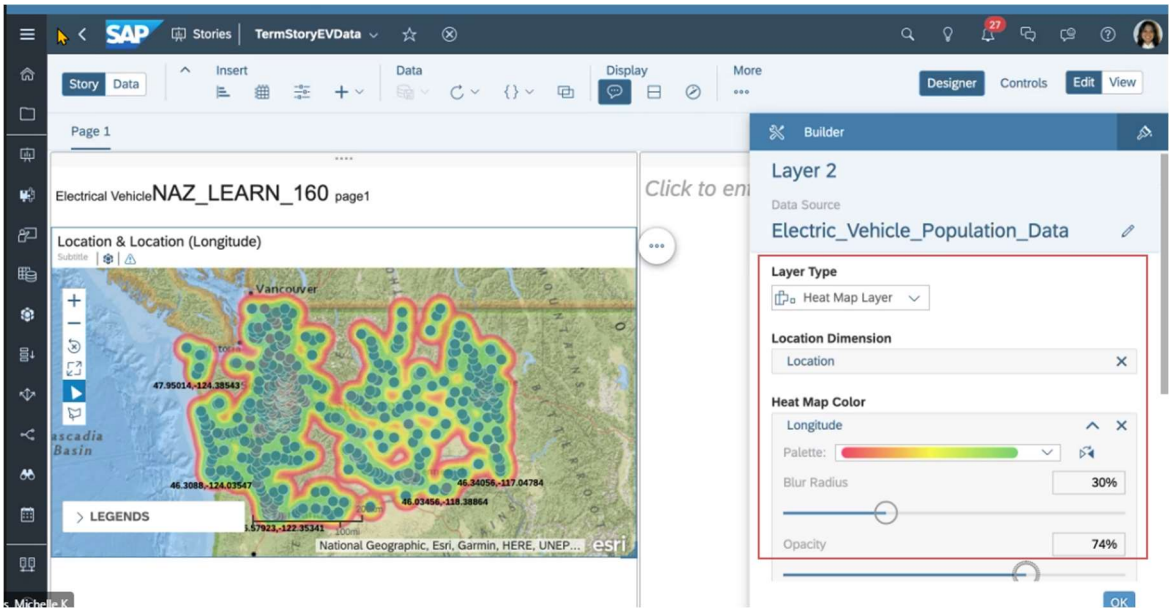
a) Geo data can be layered using multiple data sets or geographical sources. For example, you could use a different data model for layer 1 than for layer 2 and so on. We will be using the defaulted data model, Electrical VehicleNAZ_Learn_160.
b) NOTE: Don't forget to **save** your story periodically; you can hit "control + s" keys.



8. For this layer add a new layer. We are interested in EVs by zip code.

a. Under **Location Dimension**, choose **Location**.

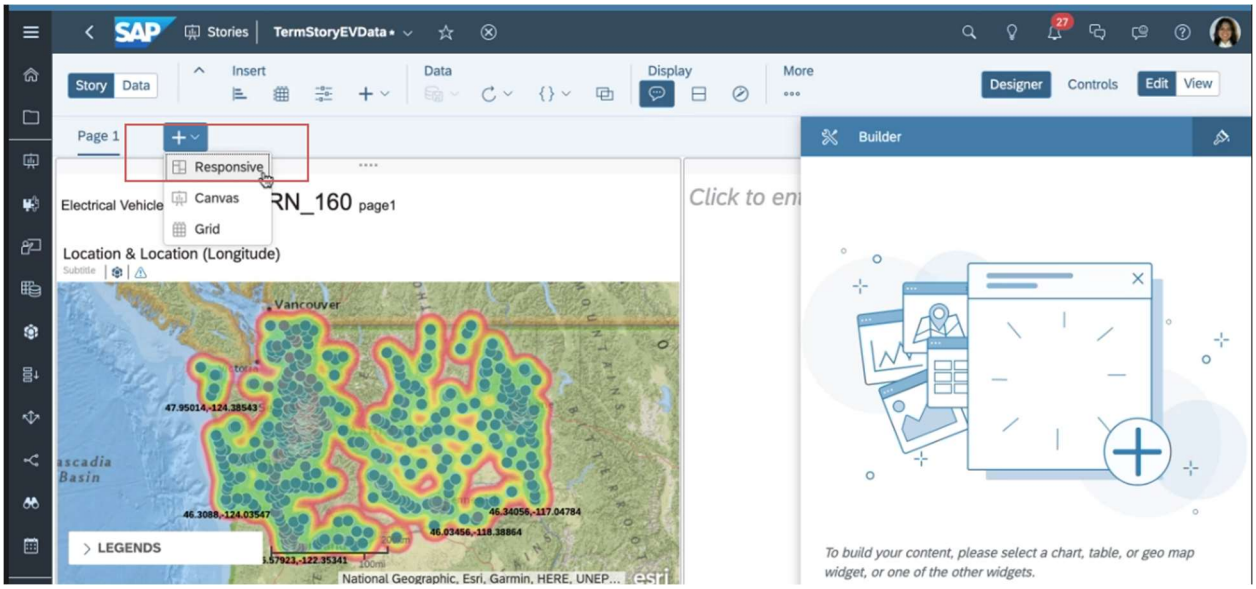
b. Under **Heat Map Color**, choose **Longitude**.



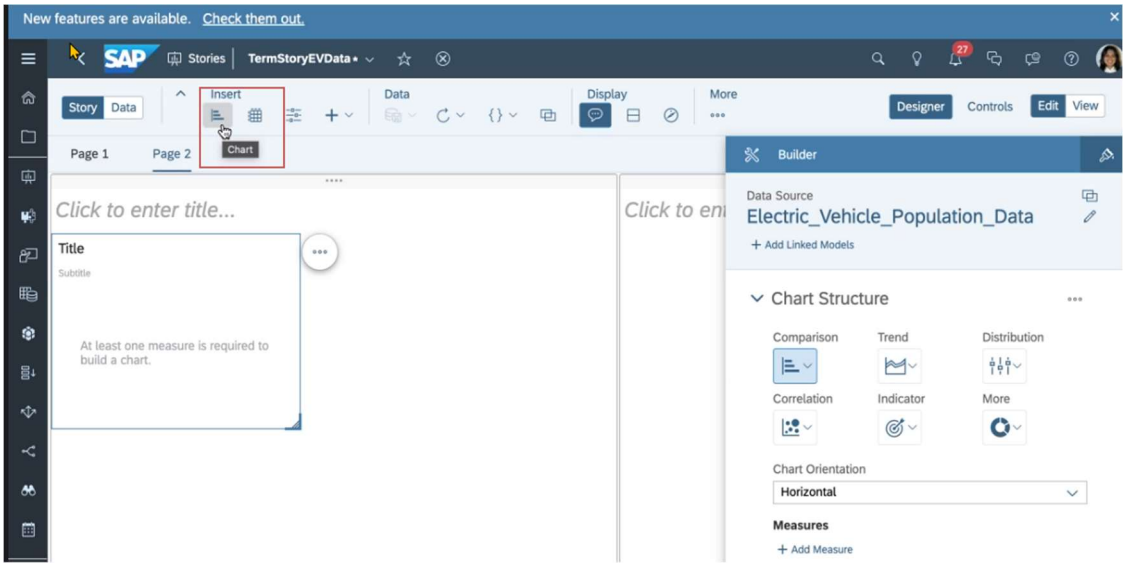
9. We may want to analyze the geographic (EV by zip code). We can build a Trend chart. In this step, we will see the amount of electrical vehicles per city.

Section 5: Create a Geo-Map Page of EV Locations in Washington

1. Add a new responsive page, Page 2.(Use the **+** next to Page 1.)



2. On the first Lane go to the menu: **Insert > Chart**



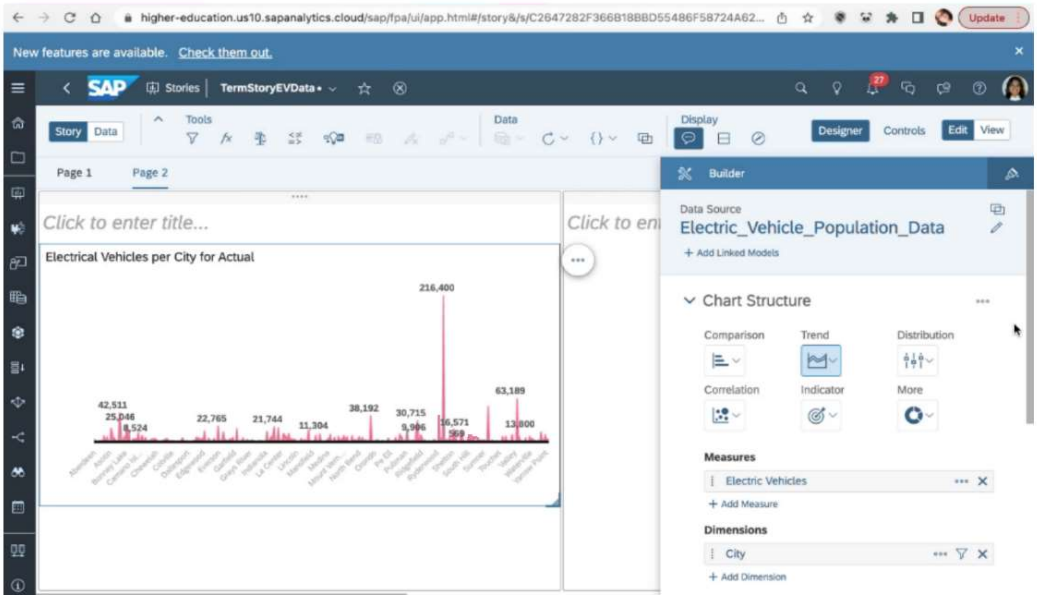
b. In the Builder panel of the figure below:

i: Set **Measures > Electrical Vehicles**

ii: Set **Dimension > City**

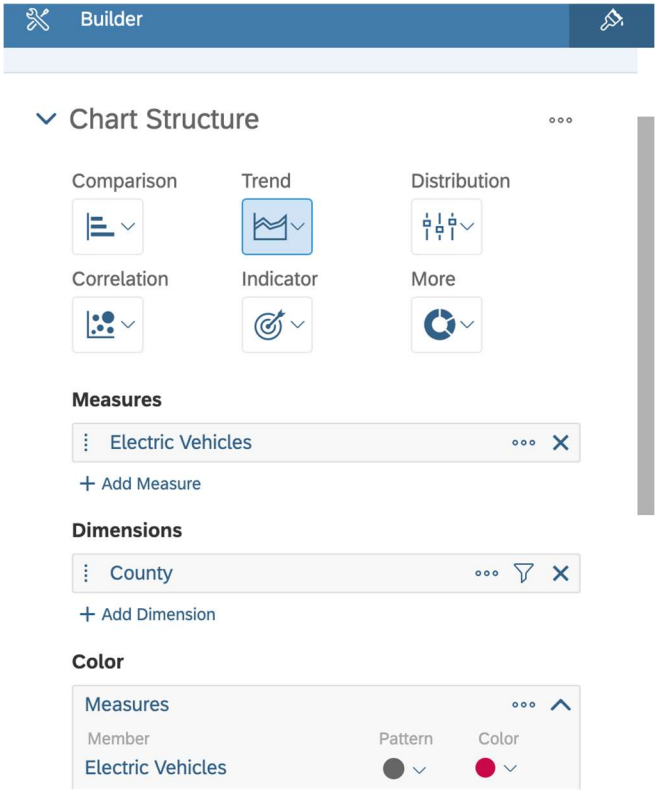
c. Then, select the chart: **Trend > Stacked Area**

d. The next step will be to choose any color of your liking for **Measures: Electric Vehicles**.

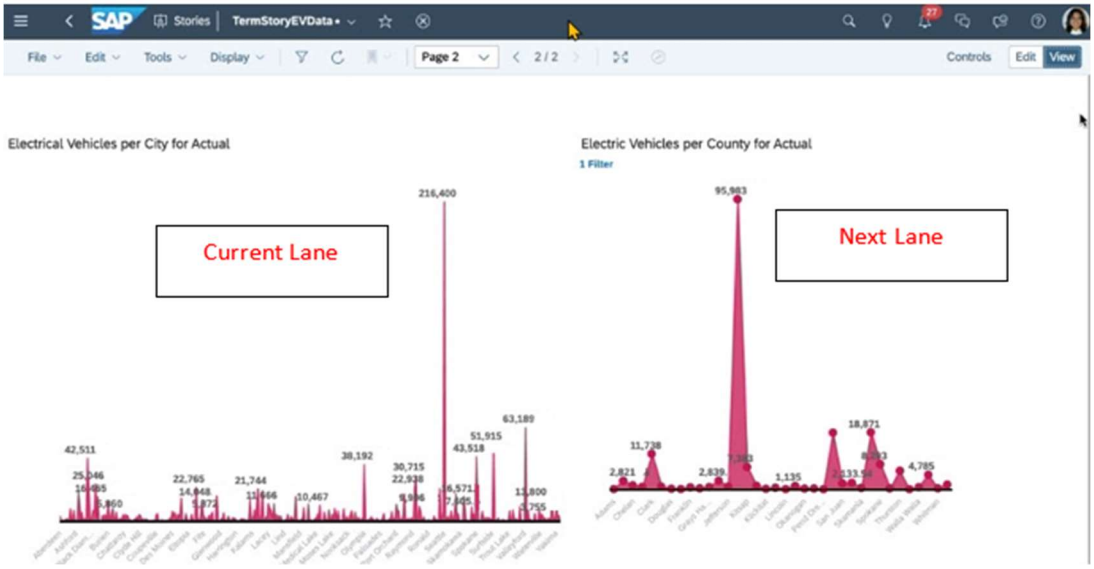


3. Click on the right side of page 2 to begin on the right side lane.

a. Go to menu: **Insert > Chart**
b. In the Builder panel of the figure below:
   i. Set **Measures > Electrical Vehicles**
   ii. Set **Dimension > County**

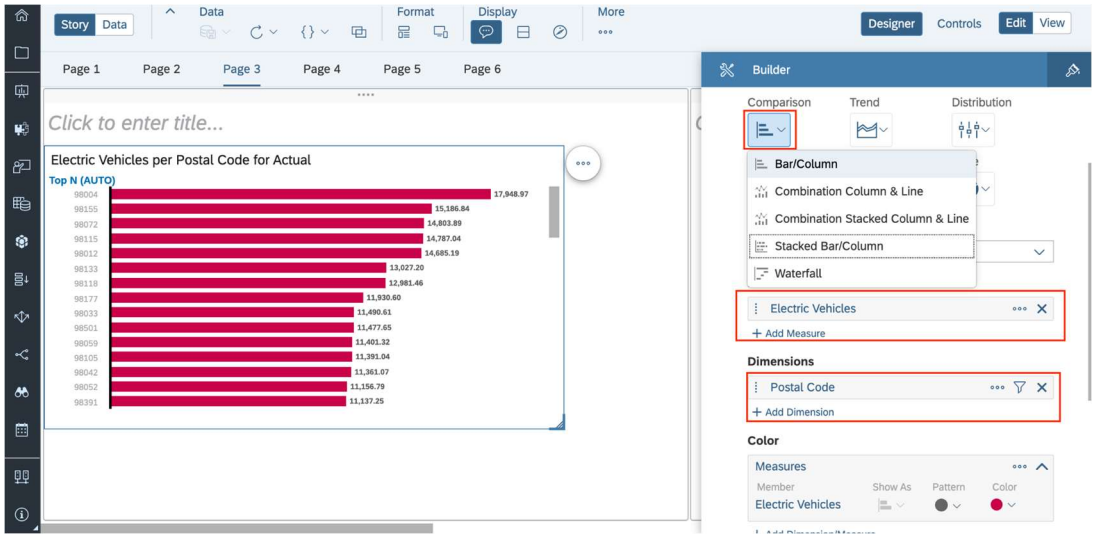


c. Then, select the chart: **Trend> Stacked Area**



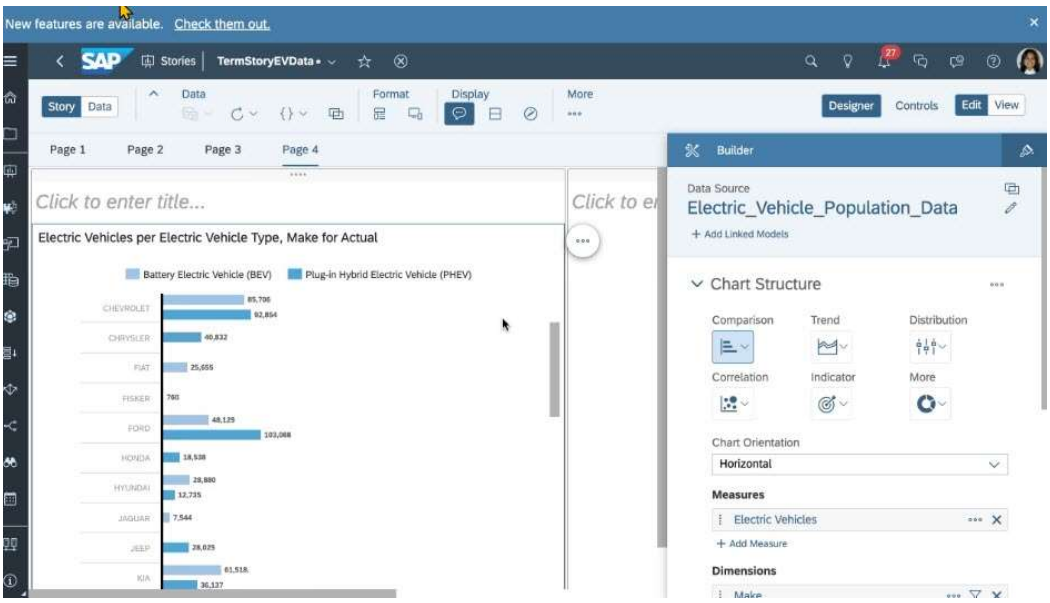
Section 6: Create Bar/Column to Show EV by Postal Code

1. Add a new responsive page, Page 3.(Use the **+** next to Page 2.)
    a. Go to menu: **Insert > Chart**
    b. In the Builder panel as seen in the figure below:
        i. Set **Measures > Electrical Vehicles**
        ii. Set **Dimension > Postal Code**
        iii. Set **Chart Orientation > Horizontal**
    c. Then, select the chart: **Comparison > Bar/Column** as seen in the image below.

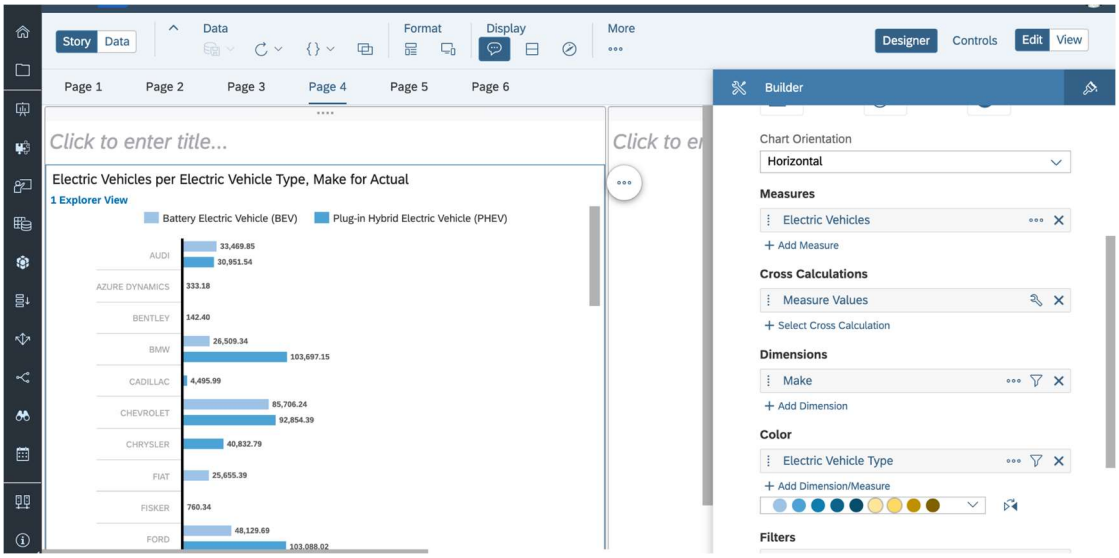


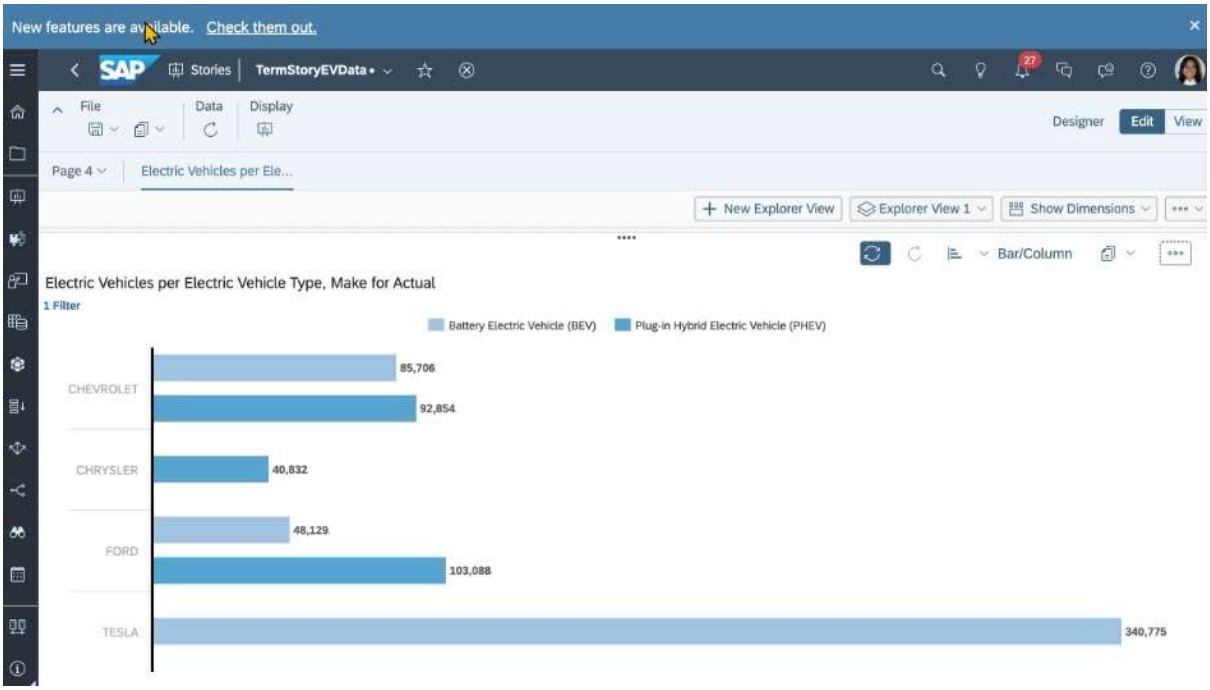
Section 7: Create Bar/Column Chart: EV Per Electrical Vehicle Type by Make

1. Add a new responsive page, Page 4. (Use the **+** next to Page 3.)
    a. Go to menu: **Insert > Chart**
    b. Then, select the chart: **Comparison > Bar/Column** as seen in the image below
    c. Set **Chart Orientation > Horizontal**

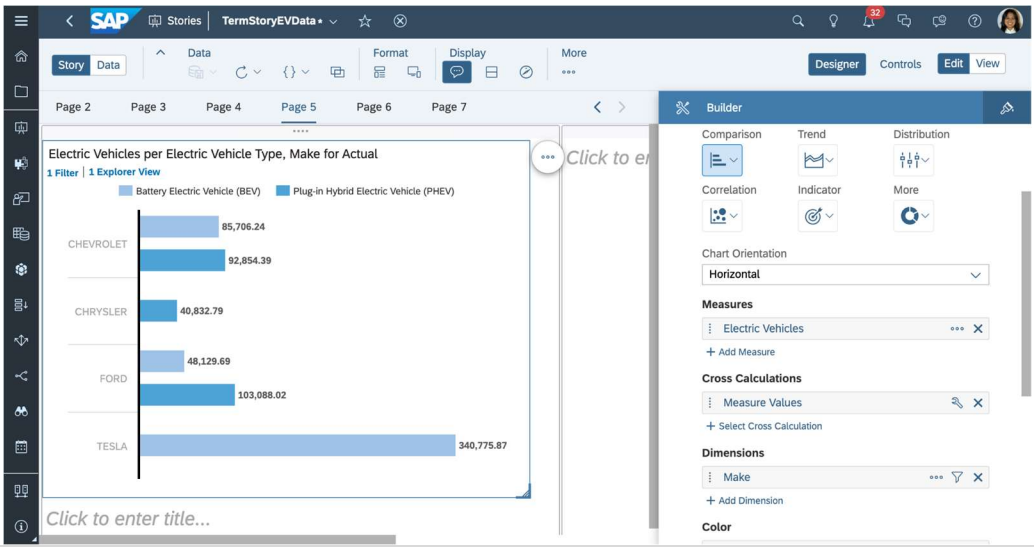


2. In the Builder panel as seen in the figure below:
    a. Set **Measures > Electrical Vehicles**
    b. Set **Cross Calculations> Measure Values**
    c. Set **Dimension> Make**
    d. Set **Color> Electric Vehicle Type**



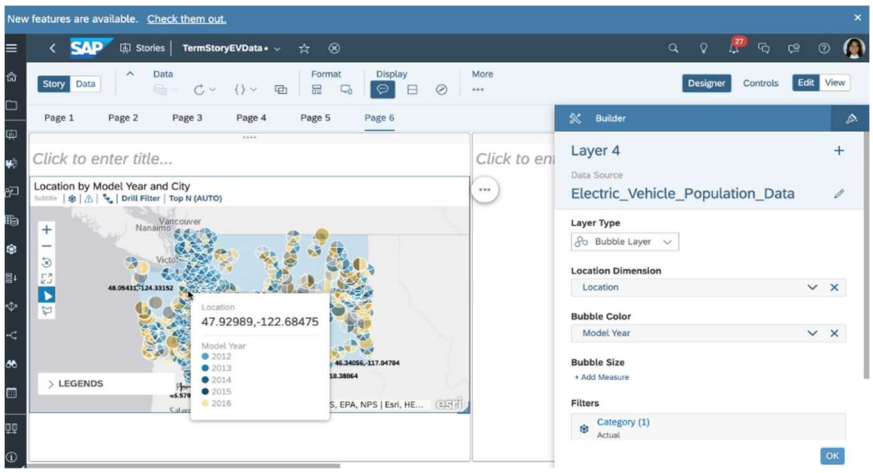


4. Add a new responsive page, Page 5. (Use the **+** next to Page 4.)
    a. Go to menu: **Insert > Chart**
    b. Then, select the chart: **Comparison > Bar/Column** as seen in the image below.
    c. Set **Chart Orientation > Horizontal**
    d. Add **Measure > Electric Vehicles**
    e. Set **Cross Calculations > Measure Values**
    f. Set **Dimensions > Make**
        i. Click on the **filter icon** and only select Chevrolet, Chrysler, Ford, and Tesla.



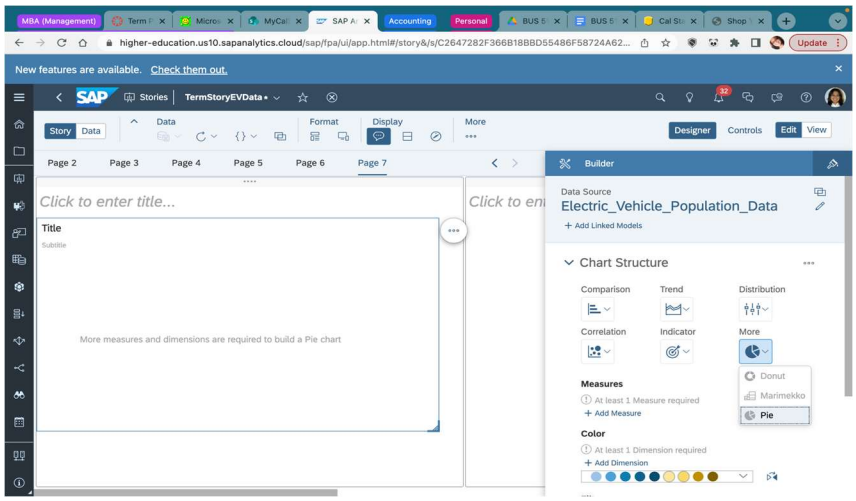
Section 8: Create a Geo-Map by Model, Year and City

1. Add a new responsive page, Page 6. (Use the **+** next to Page 5.)
    a. Go to menu: **Insert > Geomap**
    b. For this chart, we are interested in EVs by their location and model year to distinguish which models work best in the area.
2. In the Builder panel as seen in the figure below:
    a. Set **Layer 4 type> Bubble Layer**
    b. Set **Location Dimension > Location**
    c. Set **Bubble Color > Model Year**

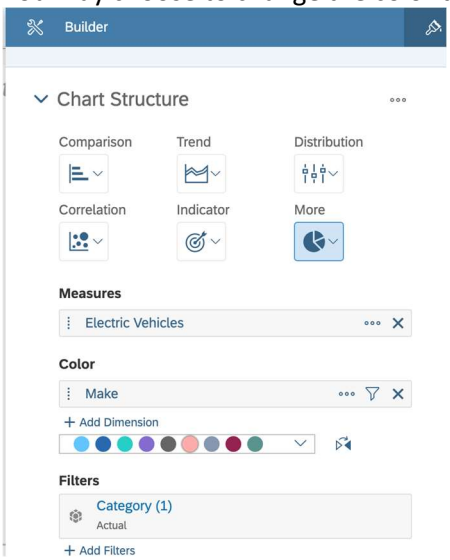


Section 9: Pie Chart: EVs Per Make

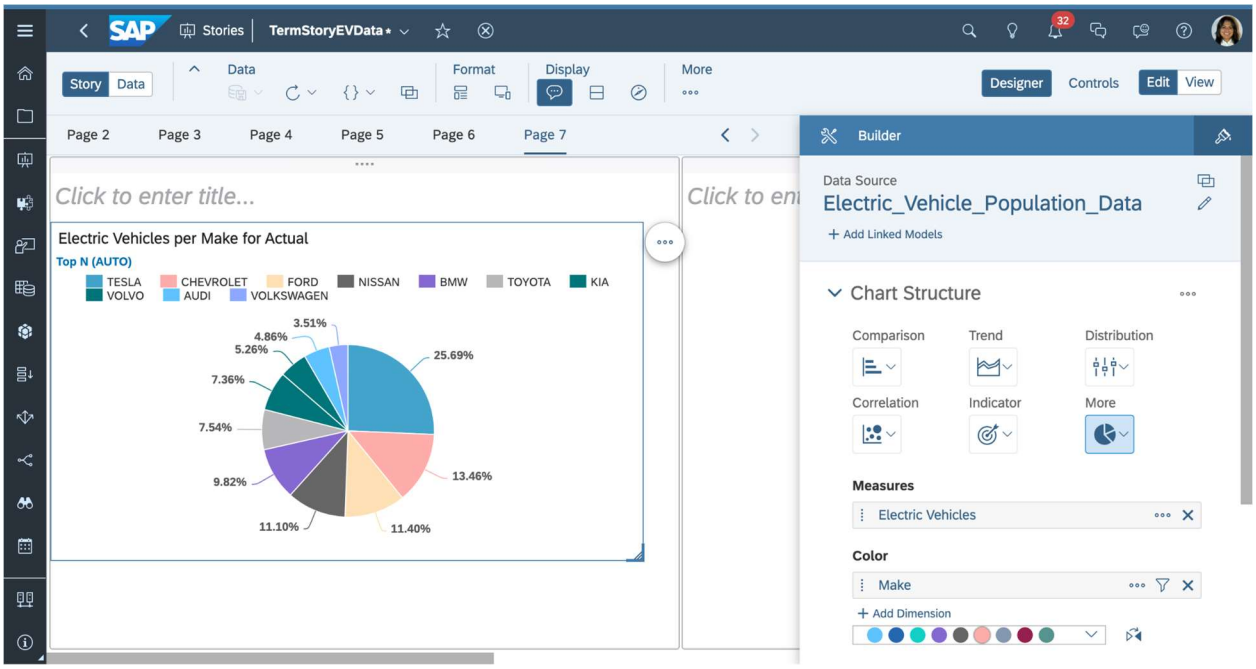
1. Add a new responsive page, Page 7. (Use the **+** next to Page 6.)



a. Go to menu: **Insert > Chart**
b. Then, select the chart: **More > Pie** as seen in the image below
c. Set **Measures > Electric Vehicles**
d. Set **Color > Make**
    i. You may choose to change the color to your choice.



2. Your image or story should look like the figure below. As you can see, the majority of Washington's EV registered vehicles are Tesla.



THIS IS THE END OF THE LAB