VISUALIZATION MAKEOVERS: AVOIDING THE MOST COMMON DATA VISUALIZATION MISTAKES

A DATA DOZEN WORKSHOP

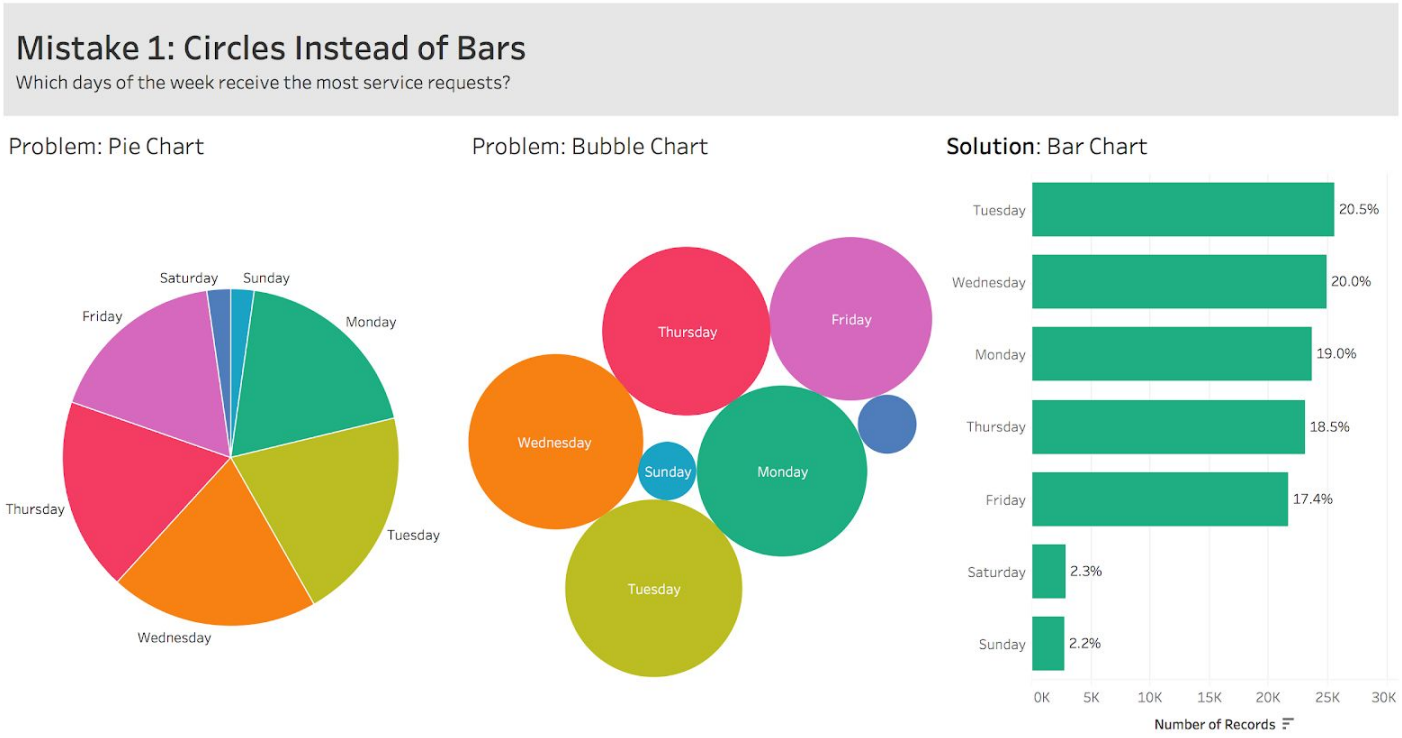
DATA DOZEN

DATA VISUALIZATION EDUCATION

LET'S GET STARTED

In this second, hands-on workshop, we'll learn to recognize and fix the most common mistakes that crop up in data visualization. By building charts in real time, we will demonstrate how we stumble into the most prevalent visualization pitfalls and, once we notice our mistake, the adjustments we can make to eliminate the problem. You can download the Complete Workbook from Tableau Public. Enjoy!

Mistake 1: Circles Instead of Bars



PROBLEM: PIE CHART

- Create a new worksheet in your Tableau workbook. (Connected to our Kansas City 311 data here.)
- Change the mark type from automatic to pie.
- Drag Creation Date to Color.
- Change Creation Date from discrete year to discrete Weekday (under more)
- Add a white border under Color.
- Drag Number of Records to Angle.
- Change the view from Standard to Entire View.
- Problem: Most of the weekday wedges are nearly impossible to tell apart. Our eyes don't handle area or angles particularly well, and pie charts rely on both.

- Best time to use pie charts is when you're looking at just two items, ideally completion of a 100% task or goal. The strongest pattern we have for circles is a clock, and therefore we've got plenty of practice telling 50% from 75% complete.

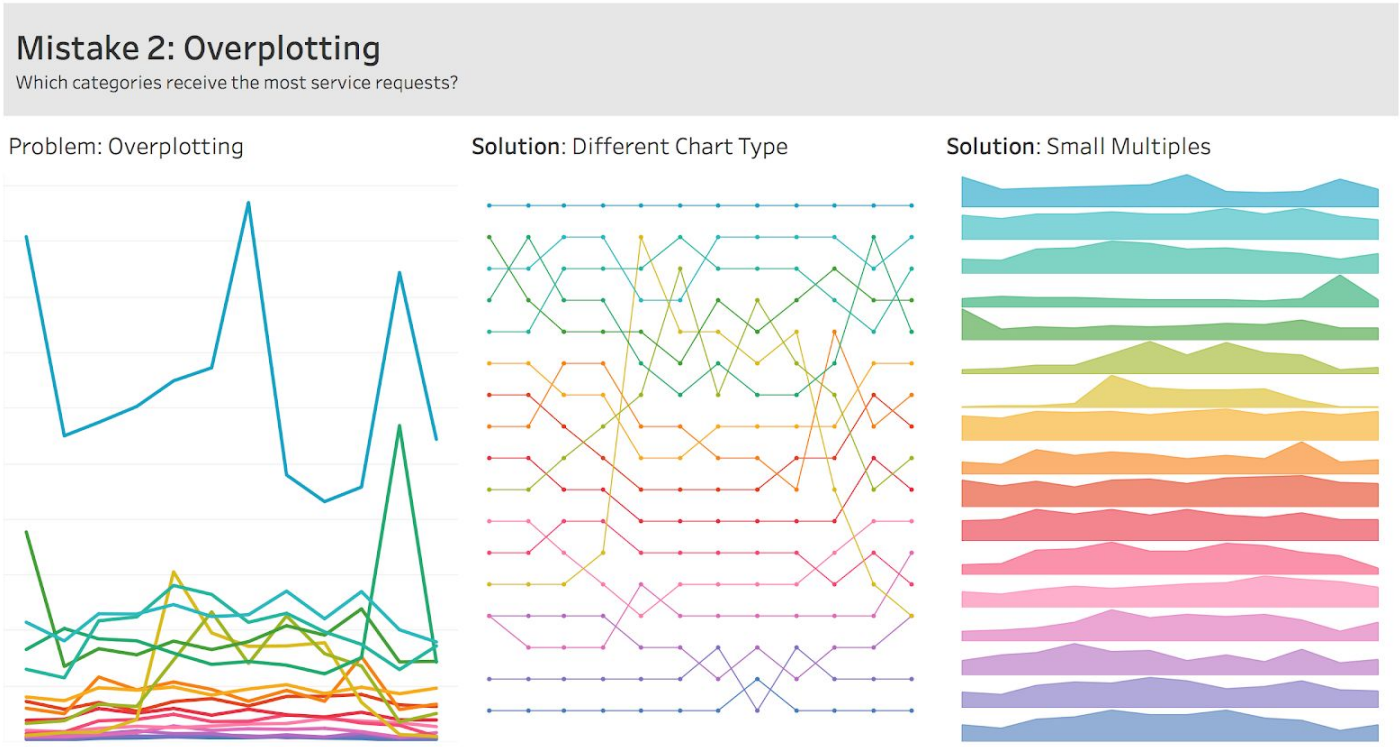
PROBLEM: BUBBLE CHART

- Create a new worksheet.
- Drag Creation Date to Color and change the pill from a discrete year to a discrete weekday.
- Drag Number of Records to Size.
- Add Creation Date to Label as well.
- Problem: Just like a pie chart, comparing area, especially in the form of a circle, is very difficult for the human eye.

SOLUTION: BAR CHART

- Create a new worksheet.
- Drag Creation Date to Rows and change the pill from a discrete year to a discrete weekday.
- Add Number of Records to Columns.
- Change the mark type from automatic to a bar.
- Sort the bars and change the view to Entire View.
- Add Number of Records to the Label and change the pill to a Percent of Total quick table calculation.
- Change the formatting in the pane to just show one decimal point.
- Solution: Bar charts are immediately accessible to the human eye. We're very good at comparing lengths, especially when that comparison is supported by helpful sorting and a label's reinforcement.

Mistake 2: Overplotting



PROBLEM: OVERPLOTTING

- Create a new worksheet.
- Drag Creation Date to Columns and change it to a continuous year.
- Drag Number of Records to Rows.
- Drag Category to Color and adjust the color pallette to Hue Circle.
- Problem: While the top category is easy to see, the bottom categories all clump together and are legibility becomes very difficult. When legibility becomes an issue, it's usually time for a new chart type. We need a form that will tease these categories apart. Here are two different options depending on your question.

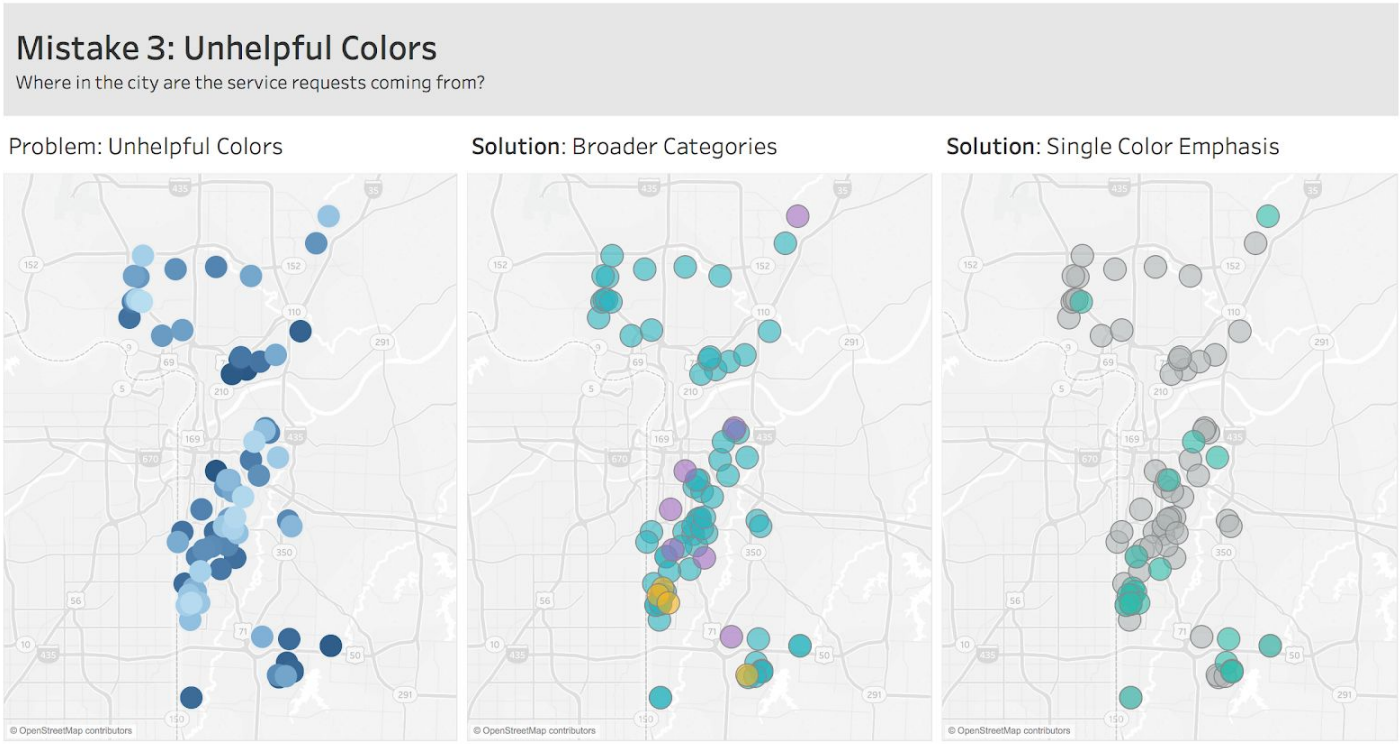
SOLUTION: BUMP CHART

- If you're mostly interested in the Categories' rank, then a bump chart is the ideal chart type.
- Duplicate your line chart.
- Click the dropdown menu on the Number of Records pill on Rows and select the Quick Table Calculation Rank. (This will look wacky. Stick with me!)
- Click the same dropdown menu again and change the Compute Using settings from Table (Across) to Category.
- Right click on the Y axis and select Edit Axis. Uncheck Include zero and Check Reverse Axis.
- Click on Color and select the middle option under Markers. Finally decrease the size of the lines.
- Solution: The bump chart gives all of the categories the same amount of space and makes their comparison easy.

SOLUTION: SMALL MULTIPLES AREA CHART

- If you're more interested in seeing the shifts in your Categories individually over time and less interested in comparing them amongst one another, a small multiples area chart might be a good option.
- Go back to your line chart and duplicate it once more.
- Drag a new Category pill to Rows and set in before the Number of Records pill.
- Right click on the Y axis (number of records) and select Edit Axis.
- Change the Range from Automatic to Independent range for each row or columns.
- Change the mark type from line to area.
- Click on the Category pill sitting on Rows and sort them from greatest to smallest number of records.
- Reassign the Hue Circle palette.

Mistake 3: Unhelpful Colors



PROBLEM: UNHELPFUL COLORS

- Create a new worksheet. Let's start by adding some filters.
- Filter Category to just Trash and Recycling.
- Filter the Creation Date to just December 7, 2018.
- Double click Latitude and Longitude. (Pause and ask yourself: what does this number represent?)
- Add Case ID to Color.
- Click Map, Map Layers, and add Base and Streets and Highways.

- Problem: These colors are impossible to tell apart, they're assigned to multiple dots. You'll also see color differences that are so slight, they're impossible to differentiate. This is when color becomes unhelpful. Here are two potential solutions (in addition to removing color altogether, which many times is your best bet!)

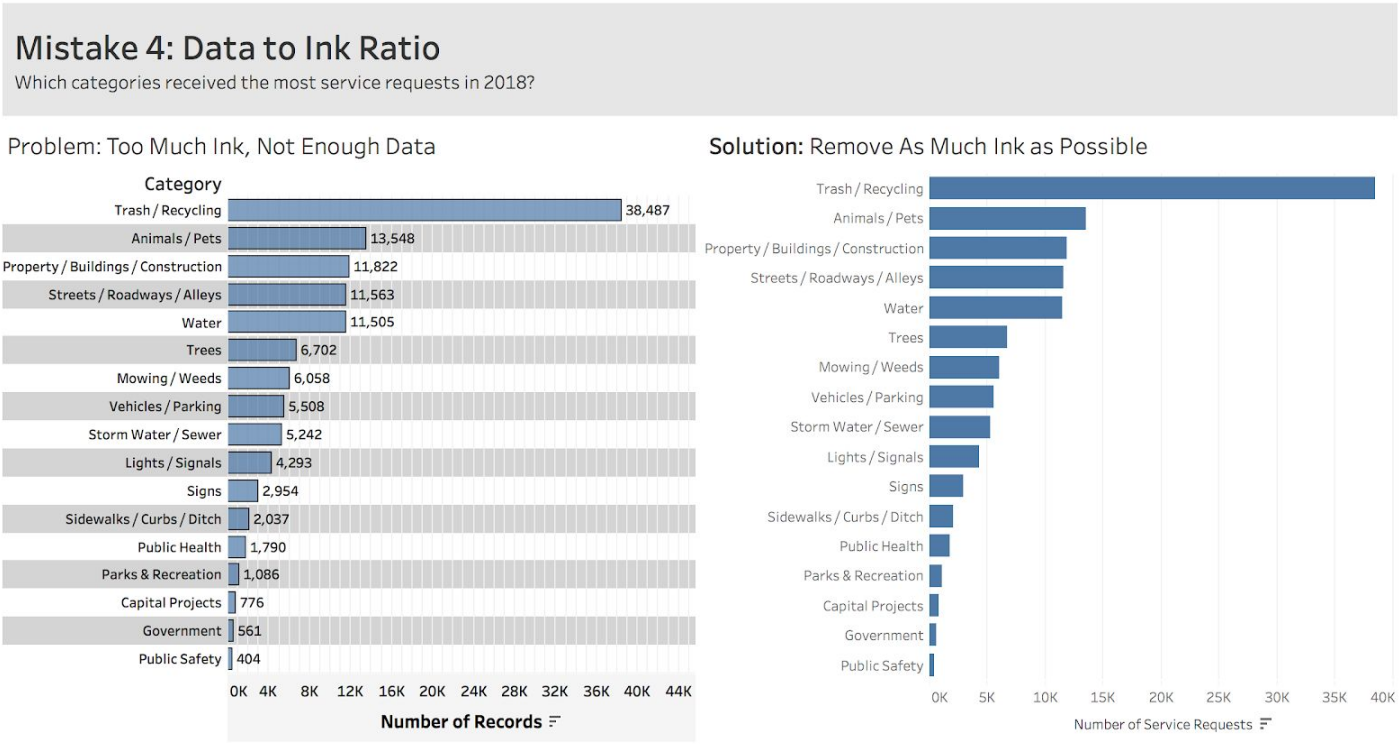
SOLUTION: BROADER CATEGORIES

- For broader categorical colors, move Case ID from Color to Detail. (Notice you retain the same number of marks.)
- Drag Source (group) to Color and adjust the palette to three different colors that are easy to differentiate.
- Under Color, also change the opacity to 50% and add a grey border.

SINGLE COLOR EMPHASIS

- To draw attention to one specific group, try replacing Source (group) with something like Type.
- Then adjust the Color palette. Select all of the Types except one (holding down shift) and assign those Types to a single color like grey.
- Then change the one remaining Type to a color that will pop out, like a red or a teal color.

Mistake 4: Data to Ink Ratio



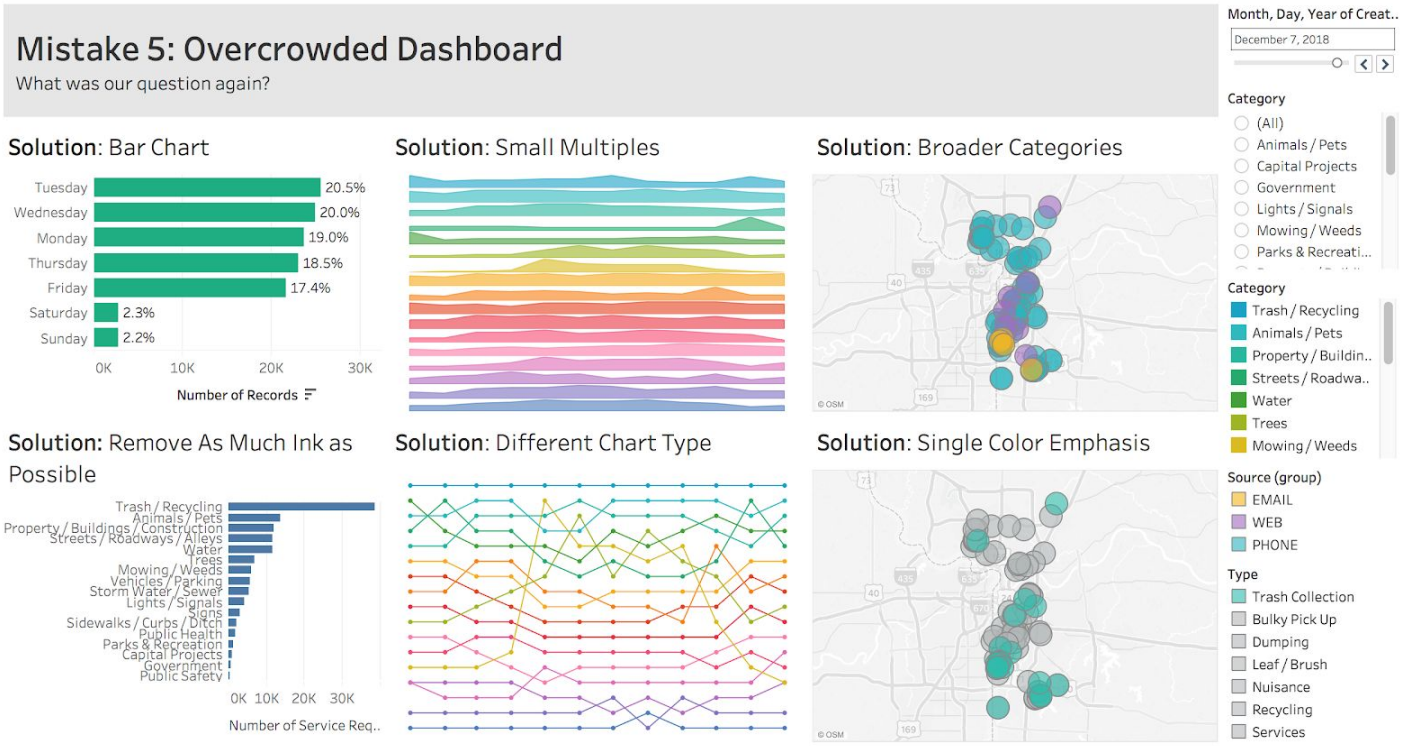
PROBLEM: TOO MUCH INK, NOT ENOUGH DATA

- Create a new worksheet.
- Build a bar chart with Category on Rows and Number of Records of Columns.
- Sort the bars from biggest to smallest and change the view to Entire View.
- Tableau's default with the amount of supporting ink is pretty spot on. It's minimalistic and allows the data itself to be the center of attention, which draws your eye there immediately.

SOLUTION: REMOVE AS MUCH INK AS POSSIBLE

- However, when you're polishing up your dashboard, take a look at the example of everything on the left. Think of everything that could be removed! Review your own visualizations for:
    - Supporting gridlines and axis tick marks
    - Borders
    - The weight of font (labels, tooltips, titles, etc.)
    - Remove double encoding or unnecessary labels.
    - Shading
- Another way of approaching this it to imagine (or actually do!) erase everything except the data marks themselves. And then ask yourself what it is exactly that you need to add back in to make your visualization readable for your given audience.

Mistake 5: Overcrowded Dashboard



PROBLEM: OVERCROWDED DASHBOARD

- Problem: folks will build really impressive visualizations and smash all of them onto a single dashboard.

SOLUTION: ANSWER ONE QUESTION AT A TIME

- Every dashboard should explore or answer one well question. Remember, multiple dashboards are a good thing!