

Tableau Design Guide for Accessibility

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Introduction

Tableau is a powerful and robust tool for communicating complex information. As state employees, it is essential to ensure that all people have equal access to information. This guide provides Tableau designers and developers with tips and tools for incorporating accessibility into their content. After following all recommendations in this guide, developers must also test for accessibility.

The [Minnesota State Accessibility Policies and Standards](#) improve the accessibility and usability of information technology products and services for all government end-users. The State standards and this guide incorporate:

- [Web Content Accessibility Guidelines 2.0, Levels A and AA](#) and
- [Section 508](#) of the Rehabilitation Act of 1973.

Tableau continues to revise its software to meet federal and state standards. For a current list of accessibility functions, visit Tableau’s Community Blog post, [What items can I use on a dashboard I want to be accessible?](#)

Accessibility is limited for any Tableau items not on this list. Review Tableau’s [FAQ: Accessibility](#) webpage for a complete list of resources and accessibility concepts.

Visual Presentation Guidelines

Color

Relevant standards and guidelines

Color is a tool frequently used in data visualization to make the visual easier to understand. The three main use cases for color in visualization are:

1. distinguish groups from one another,
2. represent data values, and
3. highlight specific data elements.

When using color in a view, do not use color alone to communicate differences in marks, as identified in [WCAG 1.4.1 Use of Color](#). Simultaneous use of labels, size, shape, or position will help convey meaning.

According to [WCAG 1.4.3 Contrast \(Minimum\)](#), there must be a contrast ratio between background colors and foreground text of at least 4.5:1. Determine the contrast ratio using a tool such as the [WebAIM Color Contrast Checker](#). This will make it accessible for people with difficulty perceiving color. Websites like [ColorBrewer: Color Advice for Maps](#) or [Accessible color palette builder](#) can help develop accessible color palettes.

The State of Minnesota has a [State Brand Color Palette](#), shown in tables 1-3. Using shades and tints of these hues gives a large selection of colors in the correct palette with more options for high-contrast pairings.

Table 1: Primary Brand Colors


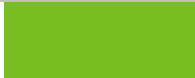

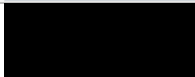
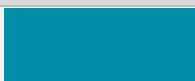
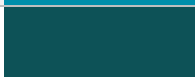
Color Name	Color Number	Color Swatch Sample
Minnesota Blue	HEX: #003865 RGB: 0 · 56 · 101	
Minnesota Green	HEX: #78BE21 RGB: 120 · 190 · 33	
White	HEX: #FFFFFF RGB: 255 · 255 · 255	
Black	HEX: #000000 RGB: 0 · 0 · 0	

Table 2: Accent Color Palette (high contrast)

Color Name	Color Number	Color Swatch Sample
Teal	HEX: #008EAA RGB: 0 · 142 · 170	
Green	HEX: #0D5257 RGB: 13 · 82 · 87	







Color Name	Color Number	Color Swatch Sample
Orange	HEX: #8D3F2B RGB: 141 · 63 · 43	
Purple	HEX: #5D295F RGB: 93 · 41 · 95	

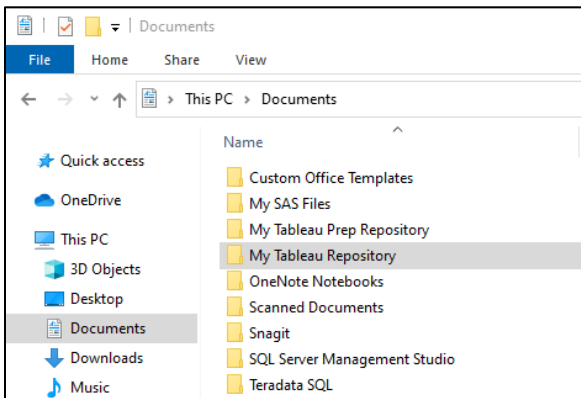
Table 3: Extended Accent Color Palette

Color Name	Color Number	Color Swatch Sample
Blue Gray	HEX: #A4BCC2 RGB: 164 · 188 · 194	
Cream	HEX: #F5E1A4 RGB: 245 · 225 · 164	
Sky Blue	HEX: #9BCBEB RGB: 155 · 203 · 235	
Gold	HEX: #FFC845 RGB: 255 · 200 · 69	

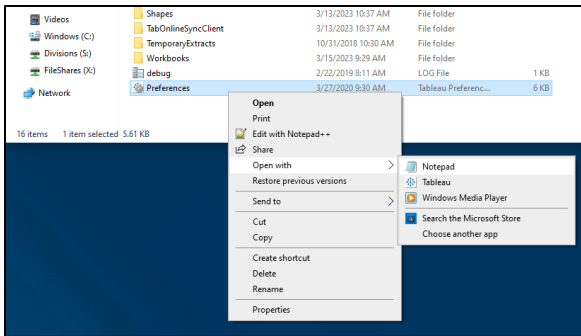
Applying to Tableau

To use specific color palettes, such as the State of Minnesota brand colors, add color codes once per computer using the steps below.

1. Open File Explorer.
2. In the left pane, select Documents. Open My Tableau Repository.



3. Right-click (Shift + F10) the Preferences file and select to open with Notepad.



4. Copy the code in the appendix and paste it between the <workbook> and </workbook> lines. The first color palette intentionally does not have a name. This makes it the default palette in Tableau.
5. Save the notepad file and restart Tableau. The new color palettes will be immediately available.

References

[State of Minnesota Brand Color Palette](https://mn.gov/portal/brand/style-guide/colors/): <https://mn.gov/portal/brand/style-guide/colors/>

[WebAIM Color Contrast Checker](https://webaim.org/resources/contrastchecker/): <https://webaim.org/resources/contrastchecker/>

[WCAG 2.0.1.4.1 Use of Color](https://www.w3.org/WAI/WCAG21/quickref/#use-of-color): <https://www.w3.org/WAI/WCAG21/quickref/#use-of-color>

[WCAG 2.0 1.4.3 Contrast \(Minimum\)](https://www.w3.org/WAI/WCAG21/quickref/#contrast-minimum): <https://www.w3.org/WAI/WCAG21/quickref/#contrast-minimum>

Font

Relevant standards and guidelines

Identify a clear hierarchy for typography. Put the most important information in the largest font, and use a distinctive color, if needed. The less important information should use a smaller font size and a more neutral color. Sans serif fonts are generally considered more legible than serif fonts. General concepts on choosing appropriate typefaces are available through [WebAIM's Fonts article](#).

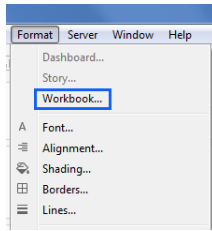
The official font family for the State of Minnesota Brand is Brandon Grotesque. This brand font is not always available to non-designers, so the state of Minnesota has selected Calibri Regular and Calibri Bold, which are more widely available, as acceptable substitute fonts. Some agencies do not have access to these fonts and have been approved to use the Tableau default font instead. Be sure any font selected is compatible with the location where the dashboard will be published. If not, Tableau will automatically select a different font, which may not be as easy to read.

Applying to Tableau

When using a font different than the Tableau default font, change the font only once for the entire workbook to ensure consistency. Individual adjustments to text size are still possible when designing graphics.

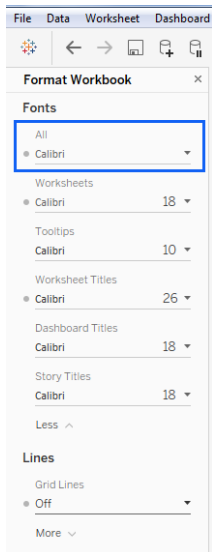
1. To change the font for the entire workbook, go to the sheet tab in the Tableau workbook and select the Format drop-down menu from the top ribbon.

2. Select Workbook.

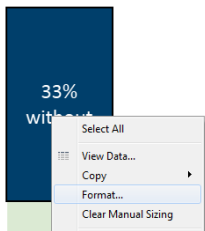


3. The left sidebar will switch from the data pane to the Formatting menu.

4. In the Fonts section, use the drop-down list to select the desired font for the entire workbook. This menu is also where to define specific sizes and colors for individual text elements such as titles and labels.



5. Make individual adjustments to the size or color of graph labels, subtitles, and mark text for a specific sheet by right-clicking (Shift + F10) on the text element of interest and selecting Format. This will bring up a formatting menu specific to that element or sheet.



References

[State of Minnesota Brand](https://mmb.extranet.mn.gov/mmb-extranet/enterprise/minnesota-brand/index.jsp): <https://mmb.extranet.mn.gov/mmb-extranet/enterprise/minnesota-brand/index.jsp>

[WebAIM Fonts](https://webaim.org/techniques/fonts/): <https://webaim.org/techniques/fonts/>

[Tableau Help – Format at the Workbook Level](https://help.tableau.com/current/pro/desktop/en-us/formatting_workbook.htm): https://help.tableau.com/current/pro/desktop/en-us/formatting_workbook.htm

Visual communication through charts and graphs

Relevant standards and guidelines

Keep visualizations simple. Present information and user interface in clear, understandable ways as discussed in the [WCAG Perceivable Principle](#). Aggregate data into a limited number of categories whenever possible to reduce the number of marks in the view. This makes it easier to identify the most important information and relationships. Limit the use of visualization types like scatterplots and small multiples, which inherently have a lot of marks. Filters are a useful way to allow users to see only the marks of interest to them, no matter the visualization type. Besides minimizing the number of marks, it is important to limit the number of different colors and shapes in a single view.

Use custom formatting options to reduce visual noise, such as background gridlines or repetitive labels, in the charts and graphs. Orient labels so that they are as legible as possible. [Tableau Help: Author Views for Simplicity](#) explains how to implement these principles in greater detail.

When using color in a view, also provide the information in another way, such as using labels, size, shape, or position. Color coding cannot be the exclusive way to:

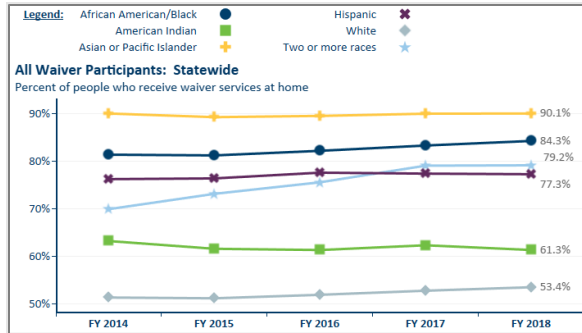
- convey information,
- indicate an action,
- prompt a response, or
- distinguish a visual element.

Applying to Tableau

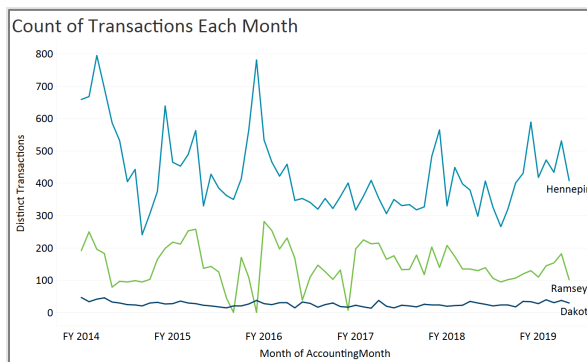
Below is an outline of some common visualization types and how to design them to best meet accessibility standards. This is not an endorsement of these chart types but is instead a set of concepts that will help with their accessibility. Note, the data in these visualizations are for example purposes only.

Please refer to the Keyboard Navigation section in this design guide to learn how users can access the underlying data of visualizations.

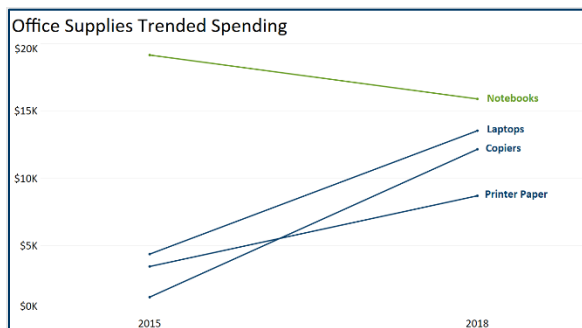
- **Line charts**
 - **Trended line chart** – This graph type shows a trend over time. Only use it for continuous periods.
 - **With data point symbols** – When showing exact values in the trend.
 - Use shapes for data points to further encode information and do not rely exclusively on color to distinguish between variables. Refer to [Tableau's Help file](#) on creating a dual axis to overlay data points on lines.



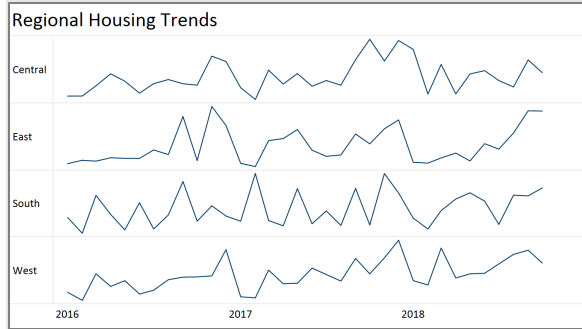
- **Without data point symbols** – When showing only the trend.
 - Label the lines directly to further encode categorical information and do not rely exclusively on color to distinguish between variables.



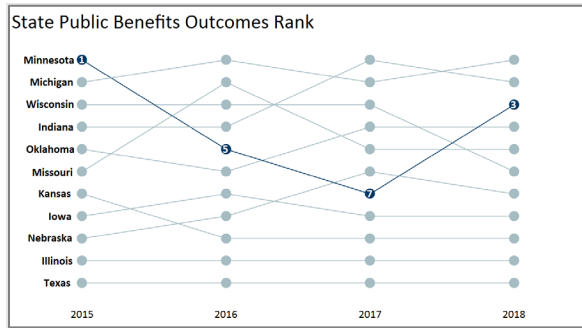
- **Slope chart** – This graph type shows relative change over two time periods.
 - Label the view directly for each line instead of encoding by color with a legend.
 - Do not dual encode by having different categories identified by separate colors. Only use color to highlight trends or other distinct information that can be gleaned another way.



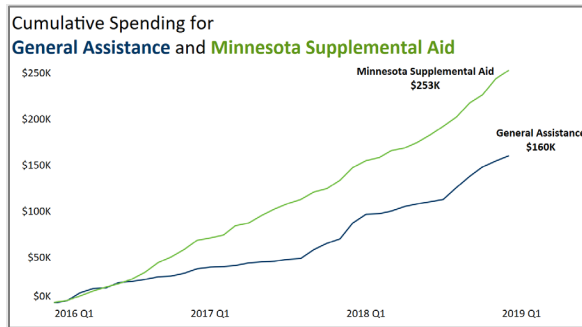
- **Sparklines** – This graph type shows trends of multiple values over a time period when the specific values are not important.
 - Using color in these graphs is not usually meaningful.



- **Bump chart-** This graph type shows rank changes over distinct points in time.
 - Highlight only one category.
 - Label lines with the variable name at either endpoint.
 - Show rankings for the highlighted variable as numbers in the data point symbols on the line.

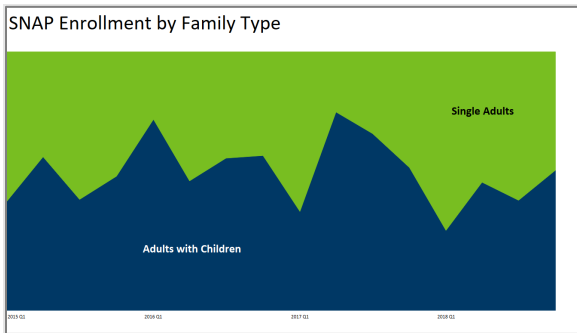


- **Cumulative curve** – This graph type shows cumulative change over time.
 - Label the end of each line with the variable name and cumulative sum.
 - Start the line on the left edge of the screen.
 - Use color to highlight an area of interest, but also convey this information in another way.

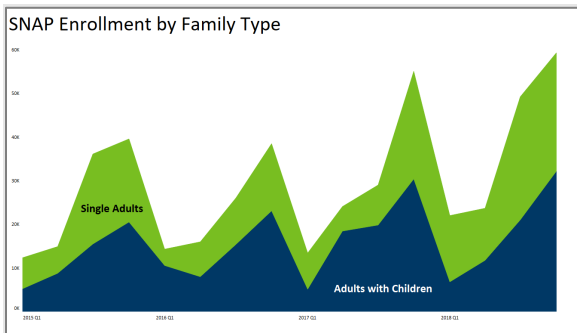


- **Area charts**
 - The vertical axis must always start at zero.
 - Put the main category on the bottom to make it easier to compare with the baseline.
 - Include no more than 3 categories in stacked area charts.
 - Label each section with titles in addition to different fill colors.

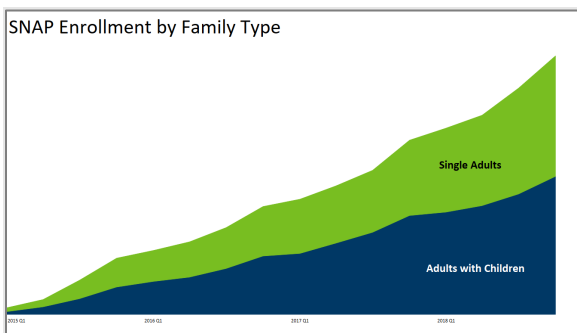
- **100% Stacked** – This graph type shows the proportion of each category over time.



- **Relative** – This graph type shows both total (aggregated) and category change over time. Total change is seen at the top of the whole chart, while category change is in each section.



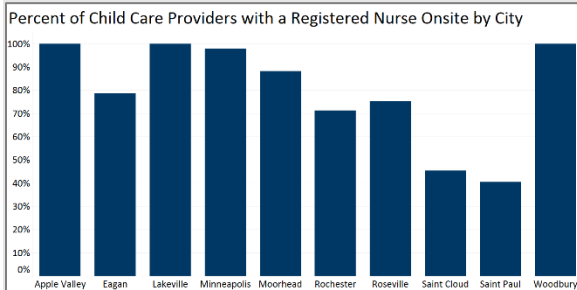
- **Filled cumulative curve** – This graph type shows cumulative total (aggregated) and category change over time. Total change is seen at the top of the whole chart, while category change is in each section.



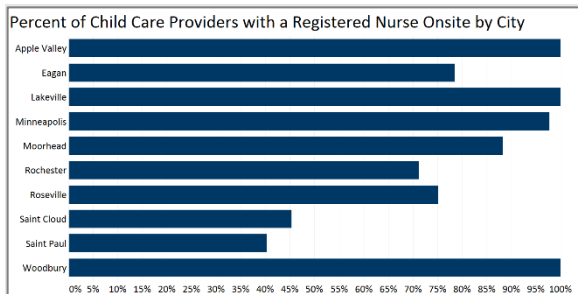
- **Column/bar charts**

- The axis must always start at zero.
- Use columns instead of bars if the dashboard has space for them since they are typically easier to read.
- Only put value labels on columns or bars when the specific value is important. Consider removing the axis values if each column or bar is labeled. If the main point of the graph is to show trends or general relationships instead of specific value comparison, do not add values.

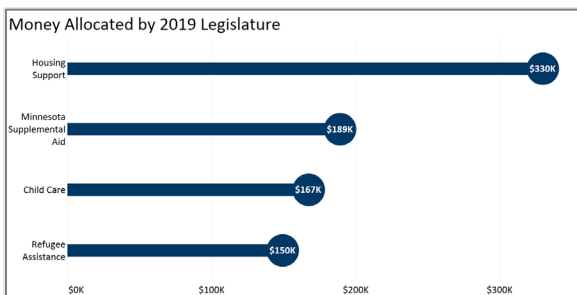
- **Column chart** – This graph type shows a comparison of a categorical variable starting at the bottom of the graph at zero.
 - Label each column with the category title.
 - Using color in these graphs is not usually meaningful. Only use color to highlight a specific value of interest, but also convey this information another way.



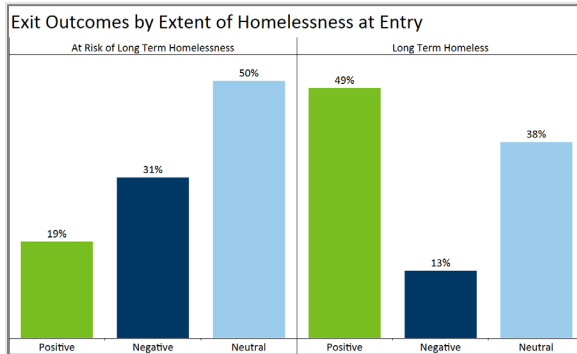
- **Bar chart** – This graph type shows a comparison of a categorical variable starting at the left of the graph at zero.
 - Label each column with the category title.
 - Using color in these graphs is not usually meaningful. Only use color to highlight a specific value of interest, but also convey this information another way.



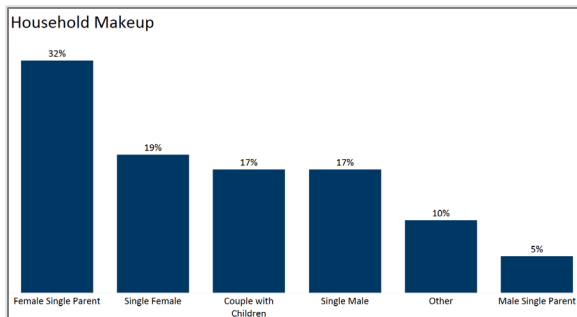
- **Lollipop chart** – This graph type shows a comparison of a categorical variable with a value called out at the end of the column or bar.
 - Label each bar with the category title.
 - Using color in these graphs is not usually meaningful. Only use color to highlight a specific value of interest, but also convey this information another way.
 - Place a value label at the center of the circle at the end of the column or bar in a strongly contrasting color.



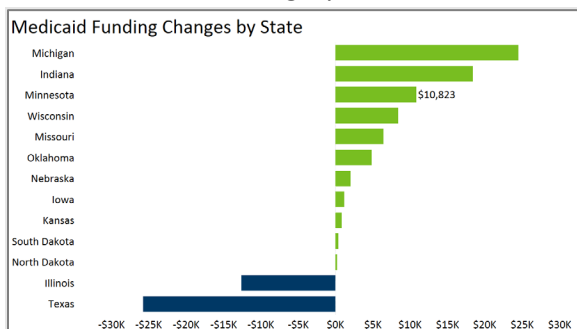
- **Grouped columns or bars** – This graph type shows a comparison of two or more categorical variables.
 - Do not exclusively encode using color. Label each column and grouping with the category titles.
 - Make comparisons within the grouping, not across the groupings.



- **Ranked columns or bars** – This graph type shows a comparison of a categorical variable ordered from the largest value to the smallest value, or the smallest value to the largest value.
 - Do not exclusively encode using color. Label each column with the category title.

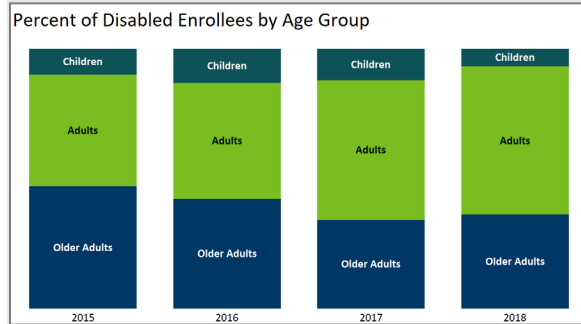


- **Diverging bar chart** – This graph type shows a comparison of a categorical variable with both positive and negative values.
 - Use both color and bar direction to distinguish between positive and negative values.
 - Include a zero line with marks on the chart.
 - Label each category.

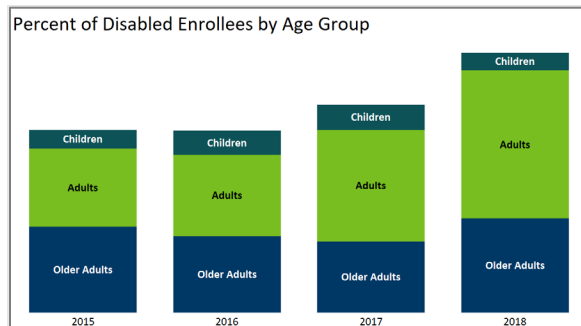


- **Stacked column or bar chart**

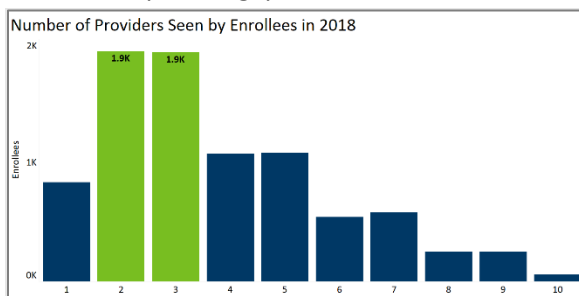
- Place the main category on the bottom as this is easier to compare with the baseline.
- Include no more than 3 categories.
- Label each section with titles, in addition to using different fill colors.
 - **100%** – This graph type shows the proportion of each categorical variable in relation to the summed value of the grouping.



- **Relative** – This graph type shows a comparison of two or more categorical variables, both the total (aggregated) and category-specific values. Total change is shown as the endpoint of the whole column or bar, while category change is in each section.

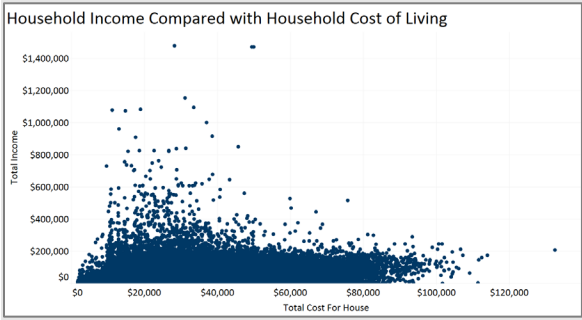


- **Histogram** – This graph type shows the statistical distribution of the data.
 - Only use color to highlight specific information of interest, but also convey this information another way.
 - Keep small gaps between each column to make it easier to see the overall shape.

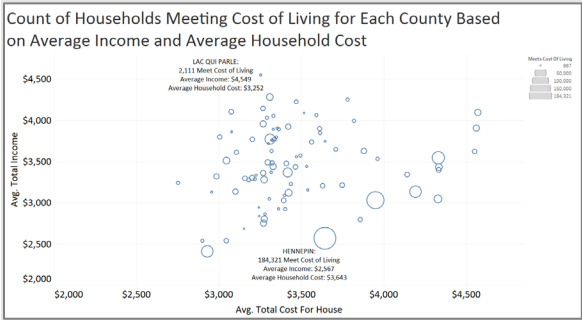


- **Correlation plots**
 - Only use these plots to show correlations and trends, not to communicate the actual value of the marks.

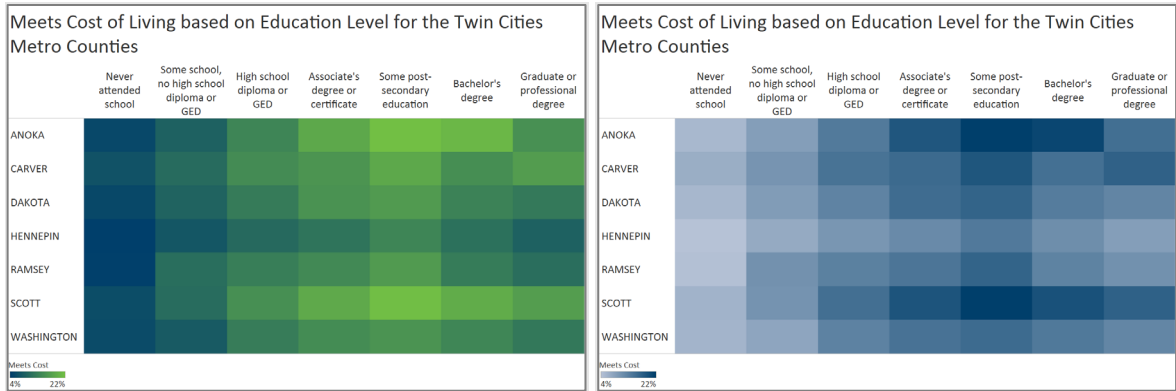
- Be aware that these charts may be difficult for some audiences to quickly interpret, so consider whether there is a simpler chart type that could be used.
- Make sure that readers of the graphic understand that correlation does not equal causation.
- **Scatterplot** – This graph type shows a relationship between two continuous variables.
 - Only use color to highlight specific points of interest, but also convey this information another way.
 - Label the axis, but not the specific dots. If needed, label key marks to call out specific information of interest.



- **Bubble chart** – This graph type shows a relationship between three variables, with each axis representing a continuous variable and the size of the bubbles indicating a third numerical variable.
 - When using buckets, make sure that the difference between each grouping is consistent for scaling the size of the bubbles.
 - Only use color to highlight specific points of interest, but also convey this information another way.
 - Label the axis, but not the specific dots. If needed, label key marks to call out specific information of interest.

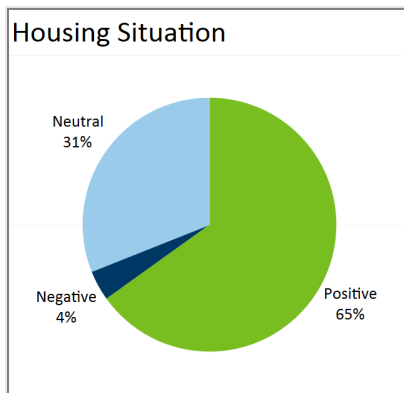


- **Heat maps** – This graph type shows the strength of the relationship between two variables. Use heat maps to highlight outliers or extreme correlations.
 - If using two colors, they need to be colorblind-friendly. When using the State of Minnesota brand colors, choose Minnesota Blue and Minnesota Green.
 - Label each row and column.

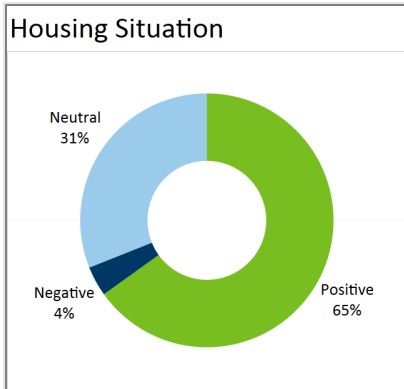


- **Part-to-whole charts**

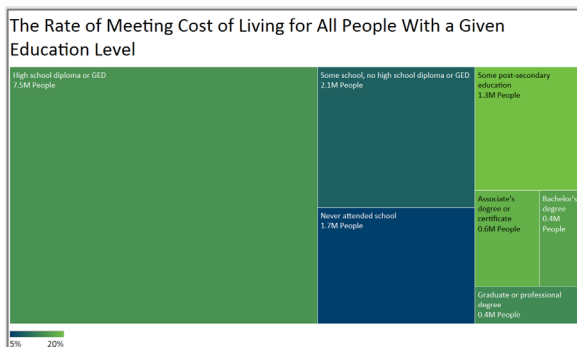
- Values need to add up to 100%.
- Label each section of a part-to-whole chart directly, not just with a legend for color.
- Only use part-to-whole charts when the values are very different from each other so have easily differentiated sizes.
- **Pie chart** – This graph type shows a comparison between categories that add up to 100%.
 - Only use pie charts when there are three or fewer categorical variables.
 - Always include percentages in the labels.
 - Do not include thick lines between the slices.



- **Donut chart** – This graph type shows a comparison between categories that add up to 100%.
 - Only use donut charts when there are three or fewer categorical variables.
 - Always include percentages in the labels.
 - Do not include thick lines between the slices.

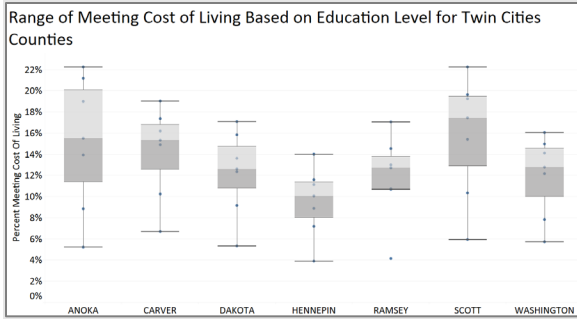


- **Treemap** – This graph type shows the relationship between two variables, with the categorical variable represented by the size of the rectangles, which add up to 100% of the dataset. If applicable, represent a second variable with color or shading.
 - The color or shading can indicate a category grouping or a rate. Include a legend to indicate what each color or color range specifies.
 - When using two colors for a range, they need to be colorblind-friendly. When using the State of Minnesota brand colors, choose Minnesota Blue and Minnesota Green.
 - Indicate what the size represents by labeling each section with a number or by including an explanation.

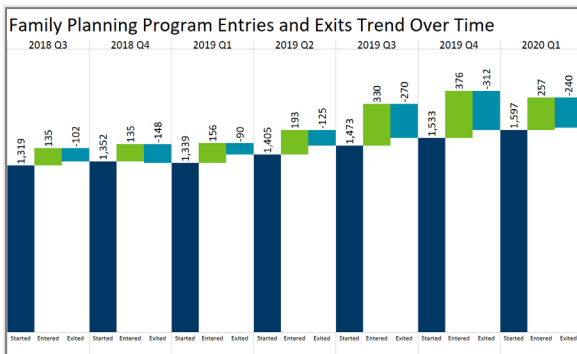


- **Advanced chart types**

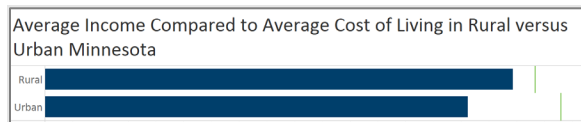
- Be aware that these charts may be difficult for some audiences to quickly interpret, so consider whether there may be a simpler chart type.
- **Box-and-whisker plots** – This graph type shows a statistical distribution of data that includes quartiles and outliers.
 - Using color in these graphs is not usually meaningful.
 - Show the first quartile, median, second quartile, and outer whiskers.
 - Showing individual data points is optional. If intending to show data points, make sure there are not too many points on the plot. It may be clearer if only the points falling outside the inner quartile range are shown.



- **Waterfall chart** – This graph type shows how an initial value changes after increasing or decreasing through a series of intermediate actions, with a final resulting value shown.
 - Show all additions first, followed by any subtractions.
 - Show numbers for each section.
 - Label each column with the text name of the category. Color should not be the only way to discern the category.
 - Use colors to group initial and final values, additions, and subtractions.

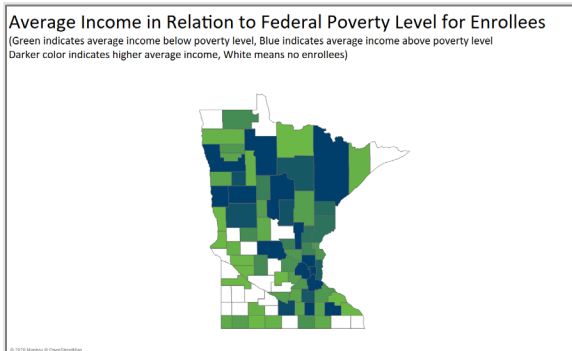
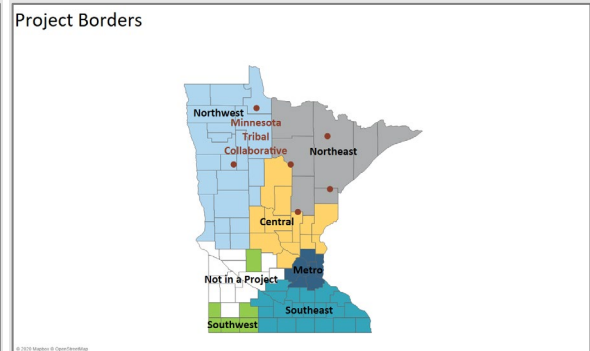
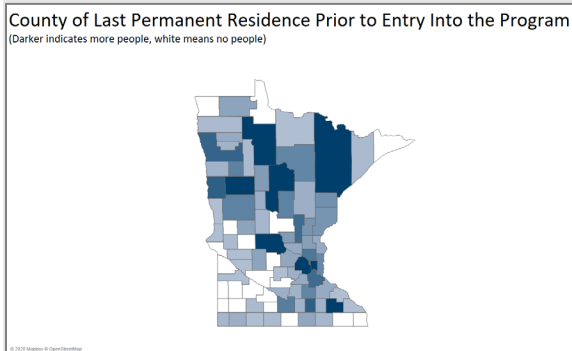


- **Bullet chart** – This graph type shows progress toward a target.
 - All axes must be the same.
 - Bold or color the target line to make it easy to see.
 - Label each category.
 - Using color in these graphs is not usually meaningful.



- **Maps** – This graph type shows the geographic distribution of a single variable or geographic boundaries.
 - In Tableau, maps are currently not accessible by screen readers. Address this limitation through a very clear and descriptive caption and an underlying data table.
 - Maps should typically be used to encode only one continuous variable. It is possible to encode more than one variable, but these maps tend to be difficult to understand quickly.

- When showing a continuous distribution of a positive or negative variable, make color sequential with one hue, not diverging across two colors.
- When showing a distribution that goes above and below a threshold, use two diverging colors. More than two hues can be used if the map is designed to show geographic boundaries.
- It may be necessary to set start and end points for the variable range to get a full range of colors. This is usually needed when there is an outlier skewing one area significantly higher or lower than the rest of the map.
- Include a key describing what the intensity of color represents.



References

[Tableau Help: Build Common Chart Types in Data Views](https://help.tableau.com/current/pro/desktop/en-us/dataview_examples.htm): https://help.tableau.com/current/pro/desktop/en-us/dataview_examples.htm

[Tableau Help: Author Views for Simplicity](https://help.tableau.com/current/pro/desktop/en-us/accessibility_create_view.htm#keep-it-simple): https://help.tableau.com/current/pro/desktop/en-us/accessibility_create_view.htm#keep-it-simple

[WCAG 1.3.3 Sensory Characteristics](https://www.w3.org/WAI/WCAG21/quickref/#sensory-characteristics): <https://www.w3.org/WAI/WCAG21/quickref/#sensory-characteristics>

[WCAG 1.4.1 Use of Color](https://www.w3.org/WAI/WCAG21/quickref/#use-of-color): <https://www.w3.org/WAI/WCAG21/quickref/#use-of-color>

Informative descriptions

Relevant standards and guidelines

As identified in [WCAG 1.1.1 Non-text Content](#), when creating a visualization, the information must also be accessible to people who cannot see the visuals. Provide text that explains the information conveyed in the visualization, why it is important, and what it means. This differs from the alt text which simply describes the content presented. To comply with [WCAG 1.3.1 Info and Relationships](#), group descriptions with the associated visualization so assistive technology knows what visualization the text references.

Descriptive text in titles, headings, captions, and labels provides context to help users better understand the data. As explained in [WCAG 2.4.6 Headings and Labels](#), simple, easy-to-understand language for titles and captions helps to clearly explain the visualization. For example, change the title of the legend to describe what the variables represent. Avoid using jargon, acronyms, and abbreviations.

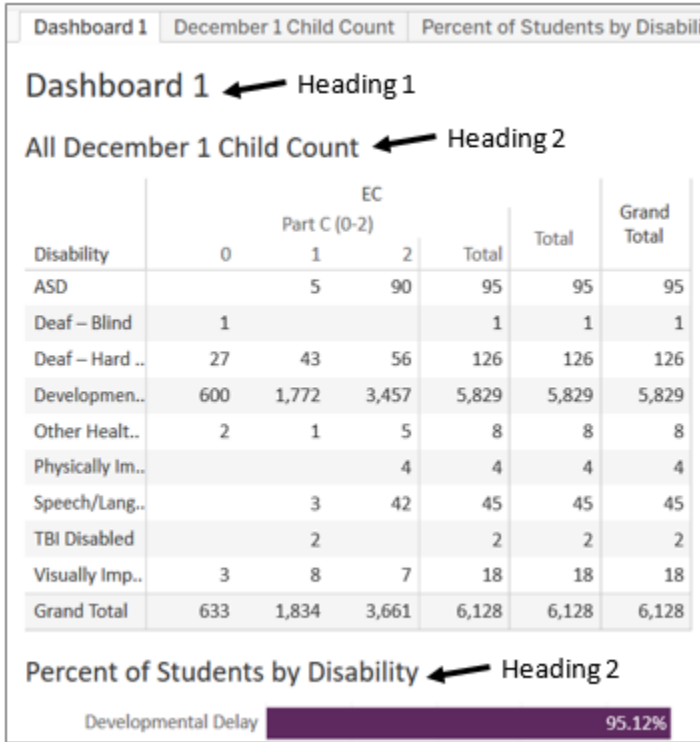
Only call out or highlight specific data points if it is meaningful to the visualization. Otherwise, it adds a layer of irrelevant information.

Applying to Tableau

Context is key. Edit text elements to provide more clarity to the user.

Titles

In Tableau, each visualization, filter, legend, and dashboard has a corresponding title. Use these to provide descriptive text in your dashboard rather than inserting independent text boxes. This maintains the inherent structure assigned to the headings. For example, if the dashboard title is tagged as Heading 1, the visualization's title should be Heading 2. Using these corresponding titles also ensures assistive technology can identify a relationship between the text and relevant visualization. Be sure to edit the default text Tableau populates so it is meaningful to the user.



Captions

In Tableau, every visualization has a corresponding caption. Tableau auto-generates the caption text based on actions taken to create the visualization. That text usually is not meaningful to the user. By default, the caption display setting is off, but screen readers still read the captions. Therefore, it is important to edit the text to provide meaningful context or delete the text if the captions are not used. The text in captions can be linked to filter settings and can be a great way to provide customized text about the visualization based on the current selections. This information can be useful to all readers, so consider turning on the captions display setting.

Data field names

It is common practice to use aliasing to rename data fields in Tableau. This provides a more meaningful label when the original field name is not clear. However, assistive technology using the background data tables cannot access the aliases and reads the original field name. To ensure clarity, change the field name directly in the underlying data table.

Tooltips

Tooltips require mouse interaction in order to appear, so are not available when using keyboard navigation or assistive technology. Therefore, make any information provided in the tooltip available in an additional location. Note: Tableau auto-generates tooltip information and makes it available to the user. Be sure to turn off or edit this if it is not meaningful to the visualization.

Step-by-step instructions on how to show and edit titles and captions can be found on [Tableau's Format Titles, Captions, Tooltips, and Legends Help File](#).

References

[Tableau's Format Titles, Captions, Tooltips, and Legends Help File](#):

https://help.tableau.com/current/pro/desktop/en-us/formatting_specific_titlecaption.htm

[Tableau's Create Aliases to Rename Members in the View Help File](#)

https://help.tableau.com/current/pro/desktop/en-us/datafields_fieldproperties_aliases_ex1editing.htm

[WCAG Principle 1 - Perceivable](#): <https://www.w3.org/WAI/WCAG21/quickref/#principle1>

[WCAG 1.1.1 Non-text Content](#): <https://www.w3.org/WAI/WCAG21/quickref/#non-text-content>

[WCAG 1.3.1 Info and Relationships](#): <https://www.w3.org/WAI/WCAG21/quickref/#info-and-relationships>

[WCAG 1.4.5 Images of Text](#): <https://www.w3.org/WAI/WCAG21/quickref/#images-of-text>

[WCAG 2.4.4 Link Purpose \(In Context\)](#): <https://www.w3.org/WAI/WCAG21/quickref/#link-purpose-in-context>

[WCAG 2.4.6 Headings and Labels](#): <https://www.w3.org/WAI/WCAG21/quickref/#headings-and-labels>

Layout

Relevant standards and guidelines

To make the dashboard clean and understandable, use a grid layout to organize the visualizations. A grid gives the user a predictable and logical order to consume the information. This meets the requirements in [WCAG 1.3.2 Meaningful Sequence](#). Most users will first look at the upper left corner of the dashboard. Place the most important information in this location. Be sure to provide enough broad context before showing more detailed visualizations.

Keep the design of the dashboard simple and clutter-free. All elements included in the dashboard should have a purpose. Give elements of a similar type the same style. For example, all filters or interactive features have a gray background, or all visualization titles are underlined. When using multiple dashboard pages, be consistent with the layout when possible, especially with navigational elements. This follows [WCAG 3.2.3 Consistent Navigation](#) and [WCAG 3.2.4 Consistent Identification](#), which require that navigational elements, such as filters, need to be in the same relative order with the same identification method across multiple pages.

Test layout design on a variety of audiences and revise based on feedback until an ideal, clear, and informative layout is created. Remember, this can be an iterative process.

Applying to Tableau

Layout containers group related dashboard items. This makes it easy to reposition sections while designing the layout. Each object placed on a dashboard, including layout containers, is either tiled or floating. The tiled layout

keeps objects and containers in a single-layer grid. The floating layout lets objects overlap and can resize in unexpected ways when viewed on different devices. Therefore, a tiled layout is recommended to maintain a meaningful sequence.

Some users may use the browser zoom when viewing the dashboard. Test the layout design at different zoom levels, up to 200%, to ensure the components remain displayed as intended.

Tableau stories

Tableau stories are another way to bring together several different visualizations. However, as of Tableau 2020.1, stories are not accessible. In their current structure, a user can only use a mouse to navigate through the pages of a story. Use of stories is not recommended unless all information and functionality are also provided in the same and accessible format.

References

[Tableau Help: Size and Lay Out Your Dashboard](https://help.tableau.com/current/pro/desktop/en-us/dashboards_organize_floatingandtiled.htm): https://help.tableau.com/current/pro/desktop/en-us/dashboards_organize_floatingandtiled.htm

[WCAG 1.3.2 Meaningful Sequence](https://www.w3.org/WAI/WCAG21/quickref/#meaningful-sequence): <https://www.w3.org/WAI/WCAG21/quickref/#meaningful-sequence>

[WCAG 3.2.3 Consistent Navigation](https://www.w3.org/WAI/WCAG21/quickref/#consistent-navigation): <https://www.w3.org/WAI/WCAG21/quickref/#consistent-navigation>

[WCAG 3.2.4 Consistent Identification](https://www.w3.org/WAI/WCAG21/quickref/#consistent-identification): <https://www.w3.org/WAI/WCAG21/quickref/#consistent-identification>

Functionality

Filters (form controls)

Relevant standards and guidelines

Tableau filters, such as checkboxes, radio buttons, and dropdown menus, are form controls. Form controls allow users to reduce the marks in the view to only those of interest. Not all form controls are currently accessible in Tableau. Refer to [Tableau Help- Creating Accessible Dashboards](#) for the most recent list. As of Tableau version 2020.2, Tableau states that parameter filters are accessible. However, it remains essential to test all filters to verify that they can be reached and function correctly with keyboard navigation and other assistive technologies.

All form controls must have clear labels and instructions, as required by [WCAG 3.3.2 Labels or Instructions](#) and [WCAG 3.2.2 On Input](#). See the section in this guide on [Informative Descriptions](#) for further information on appropriate labeling.

Applying to Tableau

Assistive technology relies on the names and roles assigned to the data variables in the underlying data source. Therefore, be sure the variables used in the form controls have clear names and roles assigned as discussed in the [Informative Descriptions](#) section in this document.

When using multiple value selection filters, enable the “Show Apply button” feature in the customize filter option. The visualization will not alter the data until all selections have been made and the “Apply” button is pushed. After applying the filter, the visualization and underlying data table will adjust accordingly. If using assistive technology, place the focus on the visualization and use Ctrl + Shift + Enter to view the customized data table. New in version 2021.3, when the focus is on the visualization, the user can hit Enter twice in quick succession to access the data table.

Refer to [Tableau’s Customize Filter Cards Help File](#) for further instructions on customizing filter options.

References

[Tableau Help: Use filters to reduce the number of marks in a view:](#)

https://help.tableau.com/current/pro/desktop/en-us/accessibility_dashboards.htm#use-filters-to-reduce-the-number-of-marks-in-a-view

[Tableau Help: Customize filter cards:](#) <https://help.tableau.com/current/pro/desktop/en-us/filtering.htm#customize-filter-cards>

[WCAG 3.2.2 On Input:](#) <https://www.w3.org/WAI/WCAG21/quickref/#on-input>

[WCAG 3.3.2 Labels or Instructions:](#) <https://www.w3.org/WAI/WCAG21/quickref/#labels-or-instructions>

Dashboard focus order

Relevant standards and guidelines

[WCAG 1.3.2 Meaningful Sequence](#) and [WCAG 2.4.3 Focus Order](#) define that meaningful sequence in a dashboard must be maintained when users access content through keyboard controls. This means that titles come first, the pertinent text needs to be associated with the chart of interest, and the order in which content is highlighted needs to make sense.

Applying to Tableau

Tableau is based on an eXtensible Markup Language (XML) platform. XML uses a series of instructions in angle brackets to instruct the computer how to display the data. Control the focus order of dashboard components by assigning an ID order to the elements in the XML code that control the dashboard’s layout.

In Tableau, dashboard zones determine its focus order. There are three ways to control the order of these zones:

- 1. Sequence of adding dashboard components** (Prior to Tableau version 2021.3)

The default focus order is the order in which components are added to the dashboard. Plan ahead to carefully add components in the same sequence as desired focus order.

2. **Automatic ordering of top to bottom and left to right** (Tableau versions 2021.3 and later)

In Tableau versions 2021.3 and later, the dashboard focus order is automatically ordered from top to bottom and left to right. There is no longer a need to load components in a specific order to set the dashboard focus order. The focus order can be tested by using keyboard tabbing when the dashboard has been loaded to a Tableau server or posted on Tableau Public. (It may be more difficult to test in the desktop mode.) For dashboards that were created in earlier versions of Tableau, the dashboard may be duplicated to achieve the same effect. See Tableau's [How can I set the focus order of the views and objects in a dashboard?](#)

3. **Adjusting the XML code**

Set order by adding numbered ID tags to the zone elements in the XML code. This may take some practice, but it can be useful when rebuilding the dashboard in the proper sequence is not feasible. For step-by-step instructions on how to do this, visit the [Tableau Community Forum on focus order](#).

References

[WCAG 1.3.2 Meaningful Sequence](https://www.w3.org/WAI/WCAG21/quickref/#meaningful-sequence): <https://www.w3.org/WAI/WCAG21/quickref/#meaningful-sequence>

[WCAG 2.4.3 Focus Order](https://www.w3.org/WAI/WCAG21/quickref/#focus-order): <https://www.w3.org/WAI/WCAG21/quickref/#focus-order>

[Tableau Community Forum Focus Order of Dashboards](#):

<https://community.tableau.com/s/question/0D54T00000C6USYSA3/how-can-i-set-the-focus-order-of-the-views-and-objects-in-a-dashboard>.

Keyboard navigation

Relevant standards and guidelines

Users must be able to access all functionality in the dashboard through keyboard navigation, consistent with [WCAG Operable Guideline 2.1 Keyboard Accessible](#).

Applying to Tableau

In Tableau, keyboard navigation is available if the Tableau dashboard is embedded in an accessible webpage, or through a link to a WCAG-conformant view or workbook in Tableau Online or Tableau Server. Tableau developed its own keyboard shortcuts unique to visualizations created with its application. The shortcut menu is found on Tableau's webpage [Keyboard Accessibility for Tableau on the Web](#). Link to this page directly on the dashboard for users not familiar with Tableau's shortcut navigation. These shortcuts may have limitations based on the assistive technology used. Tableau's Community forum page, [What is the best practice for providing keyboard navigation instructions for a dashboard?](#), provides tips for linking this directly into the dashboard.

When using assistive technology, a user accesses the data through the underlying data tables using the keyboard shortcut Ctrl + Shift + Enter. New in version 2021.3, when the focus is on the visualization, the user can hit Enter twice in quick succession to access the data table. The first Enter accesses the marks and the second opens the

data table. Turn on the permissions to allow access to the background data when publishing the dashboard. If permissions are not allowed, assistive technology cannot pull up the underlying data source.

References

[Tableau Help: Keyboard access for Tableau views: https://help.tableau.com/current/pro/desktop/en-us/access_keyboard_navigation.htm](https://help.tableau.com/current/pro/desktop/en-us/access_keyboard_navigation.htm)

[What is the best practice for providing keyboard navigation instructions for a dashboard?: https://community.tableau.com/s/question/OD54T00000C6aa8SAB/what-is-the-best-practice-for-providing-keyboard-navigation-instructions-for-a-dashboard?](https://community.tableau.com/s/question/OD54T00000C6aa8SAB/what-is-the-best-practice-for-providing-keyboard-navigation-instructions-for-a-dashboard?)

[WCAG Operable Guideline 2.1 Keyboard Accessible: https://www.w3.org/WAI/WCAG21/quickref/#keyboard](https://www.w3.org/WAI/WCAG21/quickref/#keyboard)

Publishing

Relevant standards and guidelines

Users access the visualizations and dashboards outside of the Tableau Desktop software. Accessible functionality is available when published in Tableau Server or Tableau Online or the dashboard embedded in a WCAG conformant website.

Dashboards that are not interactive are often exported as PDFs for easy viewing. Test the PDF for accessibility. Often the exported file does not include any tags. One method for manually adding tags is to export the PDF into a PowerPoint file. In PowerPoint, add the accessibility elements and export as an accessible PDF. The reading order may still need to be adjusted after exporting.

If individual visualizations are inserted into a document as an image file, add the appropriate alt text to describe the content in the chart or graph.

Applying to Tableau

[Tableau Help: Publishing Accessible Views](#) provides detailed steps on how to publish accessible views in Tableau Server or embed them in a website. Give users permission to see the views and underlying data so they can access the data with assistive technology. In addition, turn off Web Edit permissions, as that is not supported in WCAG-conformant views. For information about how to set permissions for workbooks and views, see [Set Content Permissions](#) in the online help.

Tableau can publish dashboard layouts that are optimized for specific screen sizes. Test this functionality to verify that the meaningful sequence and navigation are retained in these different layouts. More information can be found at [Tableau Help: Create Dashboard Layouts for Different Device Types](#)

References

[Tableau Help: Publishing Accessible Views: https://help.tableau.com/current/pro/desktop/en-us/accessibility_create_view.htm#Publish](https://help.tableau.com/current/pro/desktop/en-us/accessibility_create_view.htm#Publish)

[Tableau Help: Comprehensive Steps to Publish a Workbook](https://help.tableau.com/current/pro/desktop/en-us/publish_workbooks_howto.htm): https://help.tableau.com/current/pro/desktop/en-us/publish_workbooks_howto.htm

[Tableau Help: Set Content Permissions](https://help.tableau.com/current/online/en-us/permissions.htm#set-permissions): <https://help.tableau.com/current/online/en-us/permissions.htm#set-permissions>

[Tableau Help: Create Dashboard Layouts for Different Device Types](https://help.tableau.com/current/pro/desktop/en-us/dashboards_dsd_create.htm): https://help.tableau.com/current/pro/desktop/en-us/dashboards_dsd_create.htm

Resources

Links are current as of June 15, 2021.

[Accessible color palette builder](https://toolness.github.io/accessible-color-matrix/?ref=uxlift.org): <https://toolness.github.io/accessible-color-matrix/?ref=uxlift.org>

[ColorBrewer: Color Advice for Maps](https://colorbrewer2.org/#type=sequential&scheme=BuGn&n=3): <https://colorbrewer2.org/#type=sequential&scheme=BuGn&n=3>

[Minnesota State Brand](https://mmb.extranet.mn.gov/mmb-extranet/enterprise/minnesota-brand/index.jsp): <https://mmb.extranet.mn.gov/mmb-extranet/enterprise/minnesota-brand/index.jsp>

[Minnesota State Accessibility Policies and Standards](https://mn.gov/mnit/government/policies/accessibility/): <https://mn.gov/mnit/government/policies/accessibility/>

[Section 508](https://section508.gov/manage/laws-and-policies): <https://section508.gov/manage/laws-and-policies>

[Tableau Community Forum Focus Order of Dashboards](https://community.tableau.com/s/question/0D54T00000C6USYSA3/how-can-i-set-the-focus-order-of-the-views-and-objects-in-a-dashboard): <https://community.tableau.com/s/question/0D54T00000C6USYSA3/how-can-i-set-the-focus-order-of-the-views-and-objects-in-a-dashboard>

[Tableau Create Aliases to Rename Members in the View Help File](https://help.tableau.com/current/pro/desktop/en-us/datafields_fieldproperties_aliases_ex1editing.htm): https://help.tableau.com/current/pro/desktop/en-us/datafields_fieldproperties_aliases_ex1editing.htm

[Tableau Help: Create Dashboard Layouts for Different Device Types](https://help.tableau.com/current/pro/desktop/en-us/dashboards_dsd_create.htm): https://help.tableau.com/current/pro/desktop/en-us/dashboards_dsd_create.htm

[Tableau FAQ: Accessibility](https://community.tableau.com/s/question/0D54T00000C6nsjSAB/faq-accessibility): <https://community.tableau.com/s/question/0D54T00000C6nsjSAB/faq-accessibility>

[Tableau Format Titles, Captions, Tooltips, and Legends Help File](https://help.tableau.com/current/pro/desktop/en-us/formatting_specific_titlecaption.htm): https://help.tableau.com/current/pro/desktop/en-us/formatting_specific_titlecaption.htm

[Tableau Help: Author Views for Simplicity](https://help.tableau.com/current/pro/desktop/en-us/accessibility_create_view.htm#keep-it-simple): https://help.tableau.com/current/pro/desktop/en-us/accessibility_create_view.htm#keep-it-simple

[Tableau Help: Comprehensive Steps to Publish a Workbook](https://help.tableau.com/current/pro/desktop/en-us/publish_workbooks_howto.htm): https://help.tableau.com/current/pro/desktop/en-us/publish_workbooks_howto.htm

[Tableau Help: Create Dashboard Layouts for Different Device Types](https://help.tableau.com/current/pro/desktop/en-us/dashboards_dsd_create.htm): https://help.tableau.com/current/pro/desktop/en-us/dashboards_dsd_create.htm

[Tableau Help: Customize filter cards](https://help.tableau.com/current/pro/desktop/en-us/filtering.htm#customize-filter-cards): <https://help.tableau.com/current/pro/desktop/en-us/filtering.htm#customize-filter-cards>

[Tableau Help: Format at the Workbook Level](https://help.tableau.com/current/pro/desktop/en-us/formatting_workbook.htm): https://help.tableau.com/current/pro/desktop/en-us/formatting_workbook.htm

[Tableau Help: Keyboard access for Tableau views](https://help.tableau.com/current/pro/desktop/en-us/access_keyboard_navigation.htm): https://help.tableau.com/current/pro/desktop/en-us/access_keyboard_navigation.htm

[Tableau Help: Publishing accessible views](https://help.tableau.com/current/pro/desktop/en-us/accessibility_create_view.htm#Publish): https://help.tableau.com/current/pro/desktop/en-us/accessibility_create_view.htm#Publish

[Tableau Help: Set Content Permissions](https://help.tableau.com/current/online/en-us/permissions.htm#set-permissions): <https://help.tableau.com/current/online/en-us/permissions.htm#set-permissions>

[Tableau Help: Size and Lay Out Your Dashboard](https://help.tableau.com/current/pro/desktop/en-us/dashboards_organize_floatingandtiled.htm): https://help.tableau.com/current/pro/desktop/en-us/dashboards_organize_floatingandtiled.htm

[Tableau Help: Use filters to reduce the number of marks in a view](https://help.tableau.com/current/pro/desktop/en-us/accessibility_dashboards.htm#use-filters-to-reduce-the-number-of-marks-in-a-view): https://help.tableau.com/current/pro/desktop/en-us/accessibility_dashboards.htm#use-filters-to-reduce-the-number-of-marks-in-a-view

[WebAIM Color Contrast Checker](https://webaim.org/resources/contrastchecker/): <https://webaim.org/resources/contrastchecker/>

[WebAIM's Fonts](https://webaim.org/techniques/fonts/): <https://webaim.org/techniques/fonts/>

[Web Content Accessibility Guidelines \(WCAG\) 1.1.1 Non-text Content](https://www.w3.org/WAI/WCAG21/quickref/#non-text-content): <https://www.w3.org/WAI/WCAG21/quickref/#non-text-content>

[WCAG 1.3.1 Info and Relationships](https://www.w3.org/WAI/WCAG21/quickref/#info-and-relationships): <https://www.w3.org/WAI/WCAG21/quickref/#info-and-relationships>

[WCAG 1.3.2 Meaningful Sequence](https://www.w3.org/WAI/WCAG21/quickref/#meaningful-sequence): <https://www.w3.org/WAI/WCAG21/quickref/#meaningful-sequence>

[WCAG 1.4.5 Images of Text](https://www.w3.org/WAI/WCAG21/quickref/#images-of-text): <https://www.w3.org/WAI/WCAG21/quickref/#images-of-text>

[WCAG 2.0: Levels A and AA](https://www.w3.org/WAI/WCAG21/quickref/): <https://www.w3.org/WAI/WCAG21/quickref/>

[WCAG 2.0.1.4.1 Use of Color](https://www.w3.org/WAI/WCAG21/quickref/#use-of-color): <https://www.w3.org/WAI/WCAG21/quickref/#use-of-color>

[WCAG 2.4.3 Focus Order](https://www.w3.org/WAI/WCAG21/quickref/#focus-order): <https://www.w3.org/WAI/WCAG21/quickref/#focus-order>

[WCAG 2.0 1.4.3 Contrast \(Minimum\)](https://www.w3.org/WAI/WCAG21/quickref/#contrast-minimum): <https://www.w3.org/WAI/WCAG21/quickref/#contrast-minimum>

[WCAG 2.4.4 Link Purpose \(In Context\)](https://www.w3.org/WAI/WCAG21/quickref/#link-purpose-in-context): <https://www.w3.org/WAI/WCAG21/quickref/#link-purpose-in-context>

[WCAG 2.4.6 Headings and Labels](https://www.w3.org/WAI/WCAG21/quickref/#headings-and-labels): <https://www.w3.org/WAI/WCAG21/quickref/#headings-and-labels>

[WCAG 3.2.2 On Input](https://www.w3.org/WAI/WCAG21/quickref/#on-input): <https://www.w3.org/WAI/WCAG21/quickref/#on-input>

[WCAG 3.2.3 Consistent Navigation](https://www.w3.org/WAI/WCAG21/quickref/#consistent-navigation): <https://www.w3.org/WAI/WCAG21/quickref/#consistent-navigation>

[WCAG 3.2.4 Consistent Identification](https://www.w3.org/WAI/WCAG21/quickref/#consistent-identification): <https://www.w3.org/WAI/WCAG21/quickref/#consistent-identification>

[WCAG 3.3.2 Labels or Instructions](https://www.w3.org/WAI/WCAG21/quickref/#labels-or-instructions): <https://www.w3.org/WAI/WCAG21/quickref/#labels-or-instructions>

[WCAG Operable Guideline 2.1 Keyboard Accessible](https://www.w3.org/WAI/WCAG21/quickref/#keyboard): <https://www.w3.org/WAI/WCAG21/quickref/#keyboard>

[WCAG Perceivable Principle](https://www.w3.org/WAI/WCAG21/quickref/#principle1): <https://www.w3.org/WAI/WCAG21/quickref/#principle1>

Appendix

Color palette preferences

To add the [State of Minnesota brand](#) color palettes, copy this code and paste between the <workbook> and </workbook> lines in the Preferences file.

```
<preferences>
```

```
<color-palette>
```

```
<color>#003865</color>
```

```
<color>#78BE21</color>
```

```
<color>#008EAA</color>
```

```
<color>#0D5257</color>
```

```
<color>#8D3F2B</color>
```

```
<color>#5D295F</color>
```

```
<color>#A4BCC2</color>
```

```
<color>#F5E1A4</color>
```

```
<color>#9BCBEB</color>
```

```
<color>#FFC845</color>
```

```
<color>#53565A</color>
```

```
<color>#97999B</color>
```

```
<color>#D9D9D6</color>
```

```
<color>#A6192E</color>
```

```
<color>#B75B00</color>
```

```
<color>#FFFFFF</color>
```

```
<color>#000000</color>
```

```
</color-palette>
```

```
<color-palette name="MN State Brand" type = "regular">
```

```
<color>#003865</color>
```

```
<color>#78BE21</color>
```

```
<color>#008EAA</color>
```

```
<color>#0D5257</color>
```

```
<color>#8D3F2B</color>
```

```
<color>#5D295F</color>
```

```
<color>#A4BCC2</color>
```

```
<color>#F5E1A4</color>
```

```
<color>#9BCBEB</color>
```

```
<color>#FFC845</color>
<color>#53565A</color>
<color>#97999B</color>
<color>#D9D9D6</color>
<color>#A6192E</color>
<color>#B75B00</color>
<color>#FFFFFF</color>
<color>#000000</color>
</color-palette>
```

```
<color-palette name="MN Blue" type = "regular">
<color>#003865</color>
<color>#ccd7e0</color>
<color>#99afc1</color>
<color>#6688a3</color>
<color>#336084</color>
<color>#002d51</color>
<color>#00223d</color>
<color>#001628</color>
<color>#000b14</color>
</color-palette>
```

```
<color-palette name="MN Green" type = "regular">
<color>#78be21</color>
<color>#e4f2d3</color>
<color>#c9e5a6</color>
<color>#aed87a</color>
<color>#93bc4d</color>
<color>#60981a</color>
<color>#487214</color>
<color>#304c0d</color>
<color>#182607</color>
</color-palette>
```

```
<color-palette name="MN Accent Teal" type = "regular">
<color>#008eaa</color>
<color>#cce8ee</color>
<color>#99d2dd</color>
<color>#66bbcc</color>
<color>#33a5bb</color>
<color>#007288</color>
<color>#005566</color>
<color>#003944</color>
<color>#001c22</color>
</color-palette>
```

```
<color-palette name="MN Accent Green" type = "regular">
<color>#0d5257</color>
```

```
<color>#cfdcdd</color>
<color>#9ebabc</color>
<color>#6e979a</color>
<color>#3d7579</color>
<color>#0a4246</color>
<color>#083134</color>
<color>#052123</color>
<color>#031011</color>
</color-palette>
```

```
<color-palette name="MN Accent Orange" type = "regular">
<color>#8d3f2b</color>
<color>#e8d9d5</color>
<color>#d1b2aa</color>
<color>#bb8c80</color>
<color>#a46555</color>
<color>#713222</color>
<color>#55261a</color>
<color>#381911</color>
<color>#1c0d09</color>
</color-palette>
```

```
<color-palette name="MN Accent Purple" type = "regular">
<color>#5d295f</color>
<color>#dfd4df</color>
<color>#bea9bf</color>
<color>#9e7f9f</color>
<color>#7d547f</color>
<color>#4a214c</color>
<color>#381939</color>
<color>#251026</color>
<color>#130813</color>
</color-palette>
```

```
<color-palette name="MN Extended Blue Gray" type = "regular">
<color>#a4bcc2</color>
<color>#edf2f3</color>
<color>#dbe4e7</color>
<color>#c8d7da</color>
<color>#b6c9ce</color>
<color>#83969b</color>
<color>#627174</color>
<color>#424b4e</color>
<color>#212627</color>
</color-palette>
```

```
<color-palette name="MN Extended Cream" type = "regular">
<color>#f5e1a4</color>
```

```
<color>#fdf9ed</color>
<color>#fbf3db</color>
<color>#f9edc8</color>
<color>#f7e7b6</color>
<color>#c4b483</color>
<color>#938762</color>
<color>#625a42</color>
<color>#312d21</color>
</color-palette>
```

```
<color-palette name="MN Extended Sky Blue" type = "regular">
<color>#9bcbeb</color>
<color>#ebf5fb</color>
<color>#d7eaf7</color>
<color>#c3e0f3</color>
<color>#afd5ef</color>
<color>#7ca2bc</color>
<color>#5d7a8d</color>
<color>#3e515e</color>
<color>#1f292f</color>
</color-palette>
```

```
<color-palette name="MN Extended Gold" type = "regular">
<color>#ffc845</color>
<color>#fff4da</color>
<color>#ffe9b5</color>
<color>#ffde8f</color>
<color>#ffd36a</color>
<color>#cca037</color>
<color>#997829</color>
<color>#66501c</color>
<color>#33280e</color>
</color-palette>
```

```
<color-palette name="MN Neutral Dark Gray" type = "regular">
<color>#53565a</color>
<color>#ddddde</color>
<color>#babbbd</color>
<color>#989a9c</color>
<color>#75787b</color>
<color>#424548</color>
<color>#323436</color>
<color>#212224</color>
<color>#111112</color>
</color-palette>
```

```
<color-palette name="MN Neutral Medium Gray" type = "regular">
```

```
<color>#97999b</color>
<color>#eaebeb</color>
<color>#d5d6d7</color>
<color>#c1c2c3</color>
<color>#acadaf</color>
<color>#797a7c</color>
<color>#5b5c5d</color>
<color>#3c3d3e</color>
<color>#1e1f1f</color>
</color-palette>
```

```
<color-palette name="MN Neutral Light Gray" type = "regular">
<color>#d9d9d6</color>
<color>#f7f7f7</color>
<color>#f0f0ef</color>
<color>#e8e8e6</color>
<color>#e1e1de</color>
<color>#aeaeab</color>
<color>#828280</color>
<color>#575756</color>
<color>#2b2b2b</color>
</color-palette>
```

```
<color-palette name="MN Safety Red" type = "regular">
<color>#a6192e</color>
<color>#edd1d5</color>
<color>#dba3ab</color>
<color>#ca7582</color>
<color>#b84758</color>
<color>#851425</color>
<color>#640f1c</color>
<color>#420a12</color>
<color>#210509</color>
</color-palette>
```

```
<color-palette name="MN Safety Orange" type = "regular">
<color>#e57200</color>
<color>#fae3cc</color>
<color>#f5c799</color>
<color>#efaa66</color>
<color>#ea8e33</color>
<color>#b75b00</color>
<color>#894400</color>
<color>#5c1e00</color>
<color>#2e1700</color>
</color-palette>
```

```
<color-palette name="MN Blue Sequential" type = "ordered-sequential">
```

```
<color>#003f6b</color>  
<color>#b6c2d6</color>  
</color-palette>
```

```
<color-palette name="MN Primary Diverging" type = "ordered-diverging">  
<color>#003f6b</color>  
<color>#72bf44</color>  
</color-palette>
```

```
</preferences>
```