Guidelines for Figures and Tables

This document goes over requirements and recommendations for Figures and Tables for TDOT. The first section provides links to where you can review requirements for these items for the citation style chosen for your report and checklists for 508 compliance. Section 2 provides some quick recommendations for making your Tables and Figures pop.

## Section 1: Requirements

1. **For APA style, Purdue OWL provides a breakdown for how to style both:** [**https://owl.purdue.edu/owl/research\_and\_citation/apa\_style/apa\_formatting\_and\_style\_guide/apa\_tables\_and\_figures.html**](https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/apa_tables_and_figures.html)**.**
2. **For IEEE style, Purdue OWL also has a breakdown for both tables and figures. It also includes Equations:** [**https://owl.purdue.edu/owl/research\_and\_citation/ieee\_style/tables\_figures\_and\_equations.html**](https://owl.purdue.edu/owl/research_and_citation/ieee_style/tables_figures_and_equations.html)**.**
	1. **Monash University also provides guidelines:** [**https://guides.lib.monash.edu/c.php?g=219786&p=6610144**](https://guides.lib.monash.edu/c.php?g=219786&p=6610144)**.**
3. **Section 508 Requirements: Use the checklist provided in the *Section 508 Accessibility Checklist.* You can also go to FHWA’s 508 compliance website here:** <https://www.fhwa.dot.gov/508/>**. FHWA’s guidance is more comprehensive and descriptive. The Research Office used their “Making ICT Accessible” page for development of its 508 compliance guideline materials.**

## Section 2: Recommendations: Increase Your Report Appeal

“Even if you’re not misrepresenting data, if you aren’t presenting it in its most optimized form, you’re doing a disservice to your reader. Remember that every data visualization design choice you make should enhance your reader’s experience—not yours.1”

1. **Simpler is commonly better** – The foremost goal is readability. Avoid complex tables. Tables should be kept simple to comply with 508 Accessibility requirements, see the Final Report template for an acceptable example. Also refrain from overloading elements with text or imagery. For example, if a pie chart looks busy with colors, try a stacked bar chart to convey the same meaning with larger labels.
2. **If it seems like a lot of information, it should be in an Appendix** - While adding all of the survey questions to the narrative might appear helpful to convey meaning, it’s a lot to sift through. Consider information like this an area where it should be summed up and interpreted, the larger data dump can be put into an Appendix instead. Focus on including the most vital information that aids in answering the research question.
3. **Keep figure and table titles and notes brief** – If further context is needed, provide it in the narrative. The visualization should improve the ability of the reader to get the takeaways from the data or visual provided. **Ensure to add alternative text descriptions to figures conveying information as part of 508 compliance.**
4. **Use color associations to your benefit – Using a color that contrasts highly can help point out what data the reader should be looking for specifically. Or using the general green, yellow, red for showing faster or slower speeds, while obvious, is universally understood. Color contrasts should be significant enough for black and white printing. You can check your report for appropriate color contrast here:** <https://webaim.org/resources/contrastchecker/>**.**
5. **Don’t rely on color too much either - Try to not use more than 6 colors in any single figure trying to convey data. For accessibility, it is important to not use color as the sole method of conveying content or distinguishing visual elements, they should be used in association with other indicators such as simple patterns or shapes. And for charts displaying a lot of data, consider using one key color and pattern to distinguish among the many other values to get the point across that is intended in the results and discussion area.** See acceptable examples here: <https://accessibility.psu.edu/images/charts/>.
6. **Don’t set axis text at an angle –** If there is too much text on the x-axis, switch the axes to a horizontal bar chart to provide more space and greater readability.
7. **Order data intuitively, consistently, and evenly –** For example, highest to lowest or vice versa for bar charts create easy-to-read visuals. Also, similar data should be shown in the same way throughout a report, and make sure number intervals are constant (i.e. by 10% intervals, etc.)
	1. **Use negative space/Reduce non-data ink –** Crowding too much of the report with text or imagery can overwhelm the reader. Ask a few people if the report looks pleasant to the eye without reading to heavily. Are they intimidated by some of the figures or tables? Then reduce any unnecessary complexities as needed.23
8. **Play with chart visual ratios –** The visual angle of any line chart’s slope is the most readable at around 45 degrees.3 Also, the bar width in bar charts should be larger than the space between them for greater readability. Overall, the proportions of the chart should determine the layout chosen. But BE CAREFUL! Avoid this if it leads to data distortion.
9. **Use the motif provided –** The TDOT theme both provides us structure for branding and also provides a visually interesting template for readers. Sticking to the color scheme and providing complementary visuals with figures (that should also be visually consistent) will create a clean and uniform look for the report. Consider reports from the World Economic Forum or other reports from NGOs where reports are uniform for consistent presentation.
10. **For a great infographic on determining which kind of chart or figure might be best to use**, see this site: <https://venngage.com/blog/how-to-choose-the-best-charts-for-your-infographic/>.

Overall, consider a 2007 MIT study that found that layouts affect readers comprehension. A good layout caused participants to feel generally happier about what they read, and they also read the content faster.45 Balancing the meaning of the report and the data that got you there can ultimately help you improve your brand and increase its readership.

## Resources:

1. <https://www.columnfivemedia.com/25-tips-to-upgrade-your-data-visualization-design>
2. <https://www.columnfivemedia.com/top-10-report-design-tips>
3. <https://venngage.com/blog/chart-design/>
4. <https://www.columnfivemedia.com/how-to-build-a-brand-identity-with-science>
5. <https://affect.media.mit.edu/pdfs/05.larson-picard.pdf>