

## **GOOD DATA GRAPHICS SHOULD:**

Show the data.

Induce the viewer to think about the substance rather than about the methodology, graphic design, the technology of graphic production, or something else.

Avoid distorting what the data have to say.

Present many numbers in a small space.

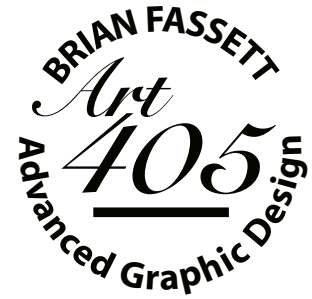
Make large data sets coherent.

Encourage the eye to compare different pieces of data.

Reveal the data at several levels of detail, from a broad overview to the fine structure.

Serve a reasonably clear purpose: description, exploration, tabulation, or decoration.

Be closely integrated with the statistical and verbal descriptions of a data set.



## **PRINCIPLES OF GRAPHICAL EXCELLENCE**

Graphical excellence is the well-designed presentation of interesting data - a matter of substance, of statistics, and of design.

Graphical excellence consists of consists of complex ideas communicated with clarity, precision, and efficiency.

Graphical excellence is that which gives to the viewer the greatest number of ideas in the shortest time with the least amount of ink in the smallest space.

Graphical excellence is nearly always multivariate.

Graphical excellence requires telling the truth about the data.

## **GRAPHICAL INTEGRITY**

The representation of numbers, as physically measured on the surface of the graphic itself, should be directly proportional to the numerical quantities represented.

Clear, detailed, and thorough labeling should be used to defeat graphical distortion and ambiguity. Write out explanations of the data on the graphic itself. Label important events in the data.

Show data variation, not design variation.

In time-series displays of money, deflated and standardized units of monetary measurement are nearly always better than nominal units.

The number of information-carrying (variable) dimensions depicted should not exceed the number of dimensions in the data.

Graphics must not quote data out of context.

# Accessible Complexity: THE FRIENDLY DATA GRAPHIC

An occasional data graphic displays such care in design that it is particularly accessible and open to the eye, as if the designer had the viewer in mind at every turn while constructing the graphic. This is the friendly data graphic

## FRIENDLY

Words are spelled out, mysterious and elaborate encoding is avoided.

Words run from left to right, the usual direction for reading occidental languages.

Little messages help explain the data.

Elaborately encoded shadings, cross-hatching, and colors are avoided; instead, labels are placed on the graphic itself; no legend is required.

Graphic attracts viewer, provokes curiosity.

Colors, if used, are chosen so that the color-deficient and color-blind (5 to 10 percent of viewers) can make sense of the graphic (blue can be distinguished from other colors by most color-deficient people).

Type is clear, precise, modest; lettering may be done by hand.

Type is upper-and-lower case, with serifs.

## UNFRIENDLY

Abbreviations abound, requiring the viewer to sort through text to decode abbreviations.

Words run vertically, particularly along the Y-axis; words run in several directions.

Graphic is cryptic and requires repeated references to scattered text.

Obscure codings require going back and forth between legend and graphic.

Graphic is repellent, filled with chartjunk.

Design is insensitive to color deficient viewers; red and green are used for essential contrasts.

Type is clotted, overbearing.

Type is all capitals. Type is sans serif.

Content from: *The Visual Display of Quantitative Information*, Edward R. Tufte

<http://www.edwardtufte.com/tufte/>