As the creator of a map you control its purpose, the conditions of use, its map scale, its technical limits, the available data, the intended audience, and its reality during the design process. Maps, in general, contain the geographic area and featured distribution(s), and the symbols used to represent them. Additionally they include a title, a legend (to explain any symbols or color used on a map), scales, direction indicators, insets, and any other pertinent information.

When creating a map there are several perceptual considerations and design principals to take into account. First, the visual center of a map versus the actual center differs. This is especially important to take into account when creating maps that will be displayed using a slide show, or displayed on a wall. Second, the connotations of symbols need to be understood. There are three basic graphic elements – points, lines and areas. For each of these the shape, size, orientation, hue (color), value (lightness or darkness), and chroma (intensity) of a given symbol need to be evaluated to determine if they are exhibiting your intended purpose. Some symbols are standard – for example, a blue area is typically water, a line with hatch marks is typically defined as railroad tracks, and a star surrounded by a circle is a capital.

**Design Principles**

**Visual Balance**
- Consider the visual impact of the arrangement. Is the map “heavy” at the top, the bottom, or sides?
- Arrange objects around the optical (or “natural”) center – which is 5% higher than the geometric center.
- Unequal arrangement of space is more interesting

**Legibility**
- Easy to read
- Not confusing
- Distinguishable
- Differences must be visually distinct (quantitative differences may not be the same as perceptual differences)

**Visual Contrast**
- Symbols should contrast with the background (note that maximum contrast is not necessarily desirable).

**Figure-ground Relationships**
- The human mind will organize
- Your eyes will settle on the figure
- The rest belongs to the ground around the figure

**Text**
- Use a mixture of Upper case and lower case letters
- All uppercase is harder to read
- Avoid fancy fonts
- Large print for important information
- Small print for non-important information
- Vary a single type of font rather than using different fonts
- Fonts smaller than 8 may become difficult to interpret
Text Placement

Internal Graphic Structure
- Separate meaningful characteristics
- Establish levels of relative importance
- Combinations of visual variables can produce a visual layering of mapped features

Visual Weight
- Depends on location:
  - objects near center have less weight
  - objects weight increases with distance from center
  - objects at top are heavier than those at the bottom
  - objects on the right are heavier than those on the left
- depends on size
- depends on color
  - Red > Blue, Bright > dark
  - Complex > simple

Color
- Color Brewer (http://www.personal.psu.edu/cab38/ColorBrewer/ColorBrewer.html)
- Black and white considerations
- Reproducibility (some colors do not photo copy well)
- Those who are color blind