Cartographic Design Theory

Cartographic Design Theory

Session Objectives:

At the conclusion of this session, you will be able to:

- Create Figure-Ground relationships between thematic and base data through the use of contrast
- Focus the Attention of the user
- Balance your map elements
- Apply internal organization to your map compositions

Cartographic Design Theory

- **Figure - Ground**

Figure - Ground

- Most important perceptual tendency of cartography.
- Figures become the object of attention in perception, standing out from the background.
- Objects that are intellectually important to a map should be rendered so as to make them appear as figures.

Figure - Ground

- *figure* : we look at and...
- *ground* : what forms the background

Figure - Ground

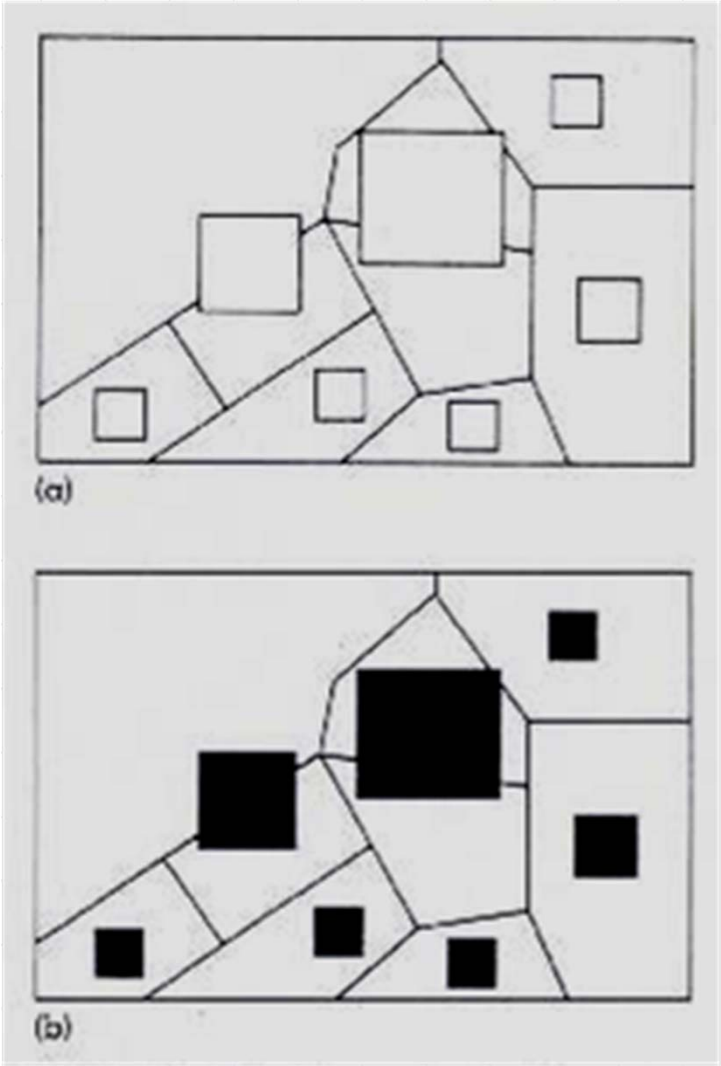
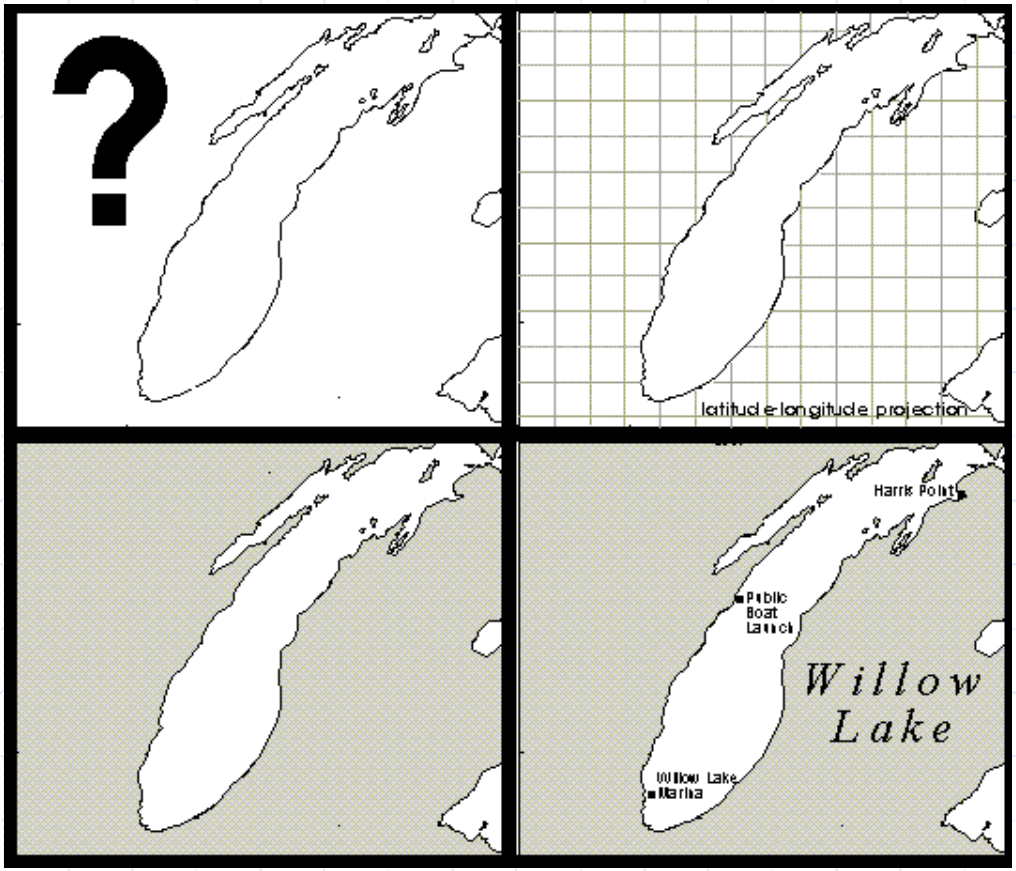


Figure - Ground

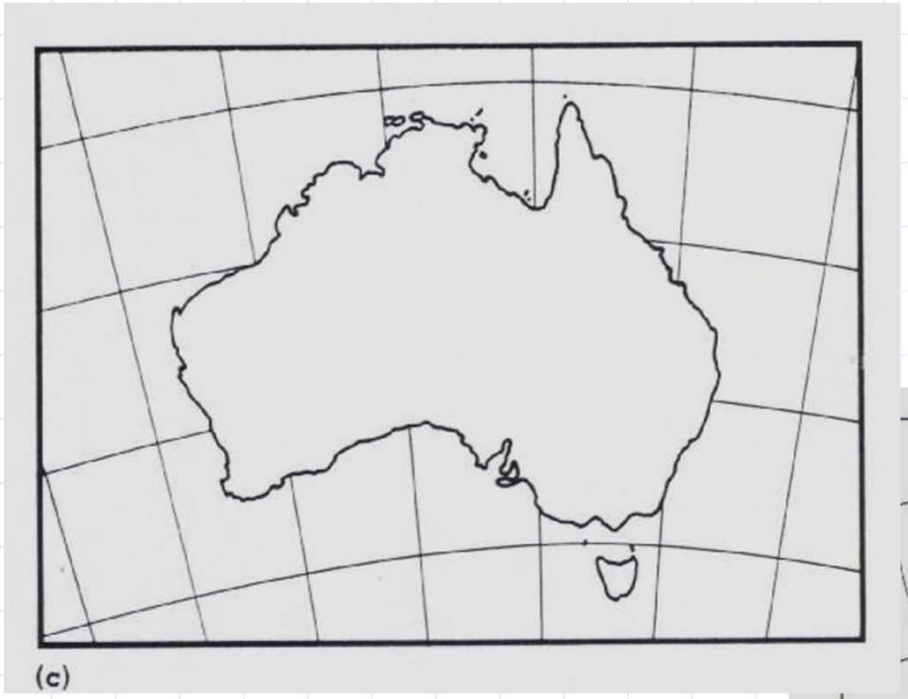


Contrast & Design

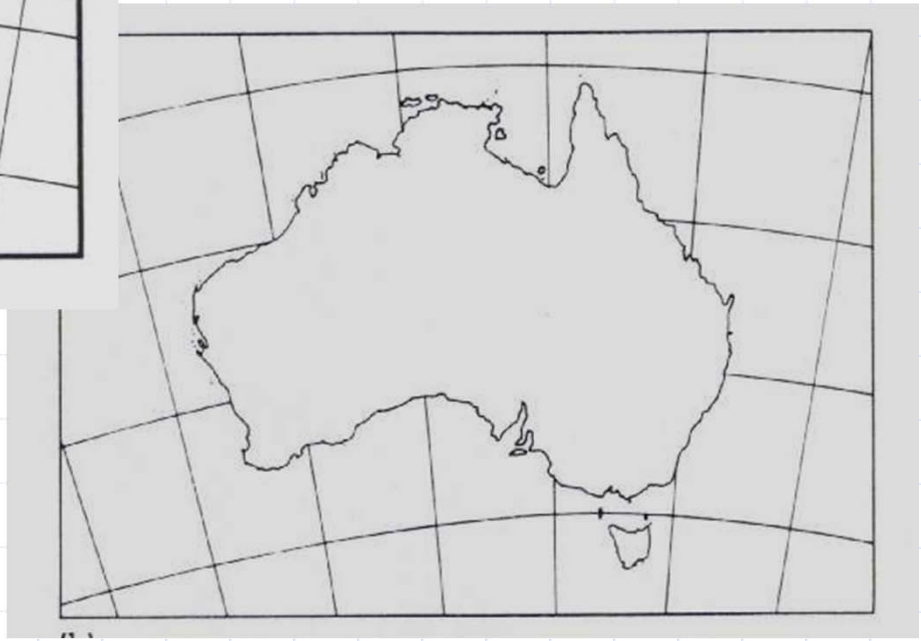
- Contrast is fundamental to developing figure-ground
- Visual contrast enables the eye to discern differences
- Map elements that provide little contrast are easily lost in the overall visual package
- The designer encourages contrast with...

Contrast & Design

line contrast

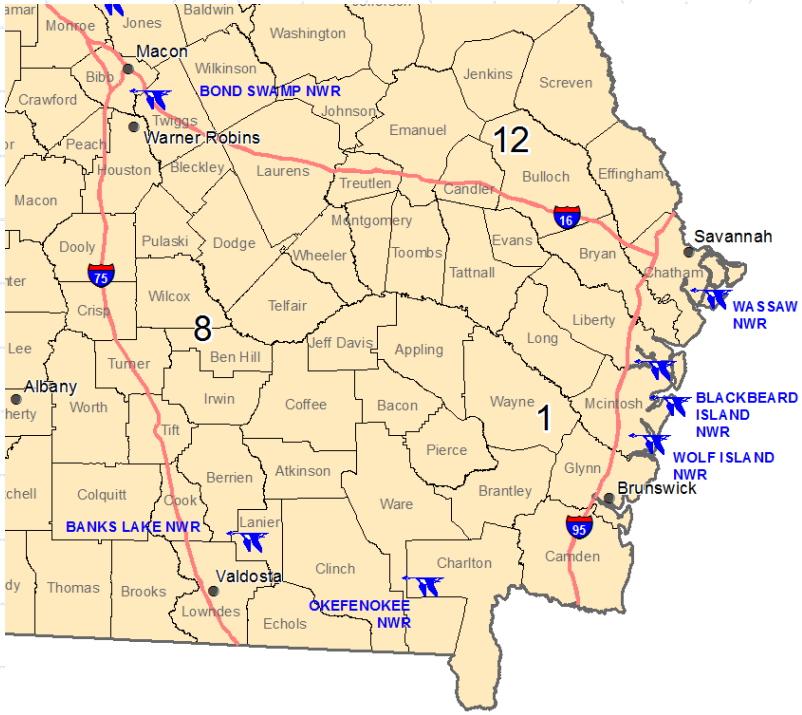


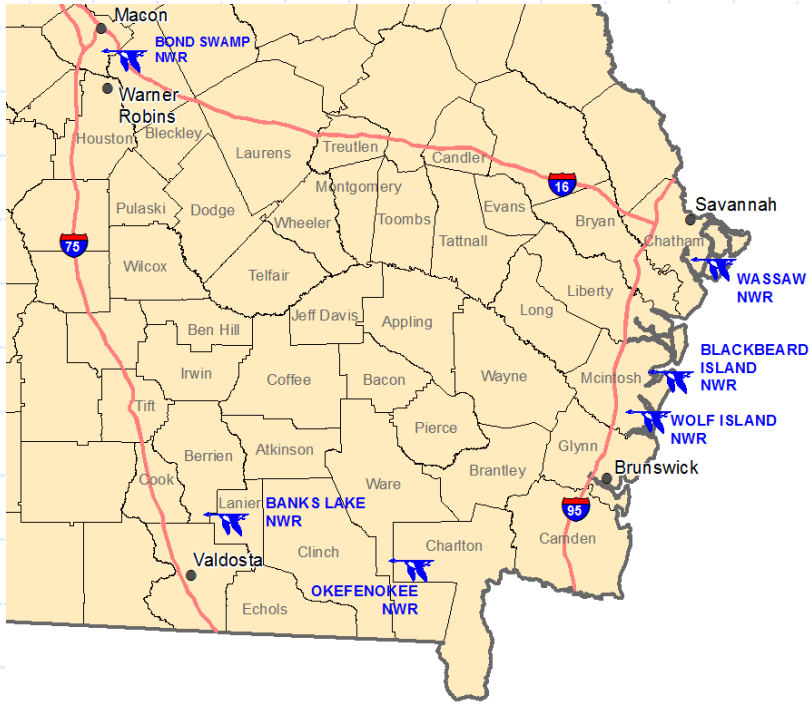
(c)



Contrast & Design

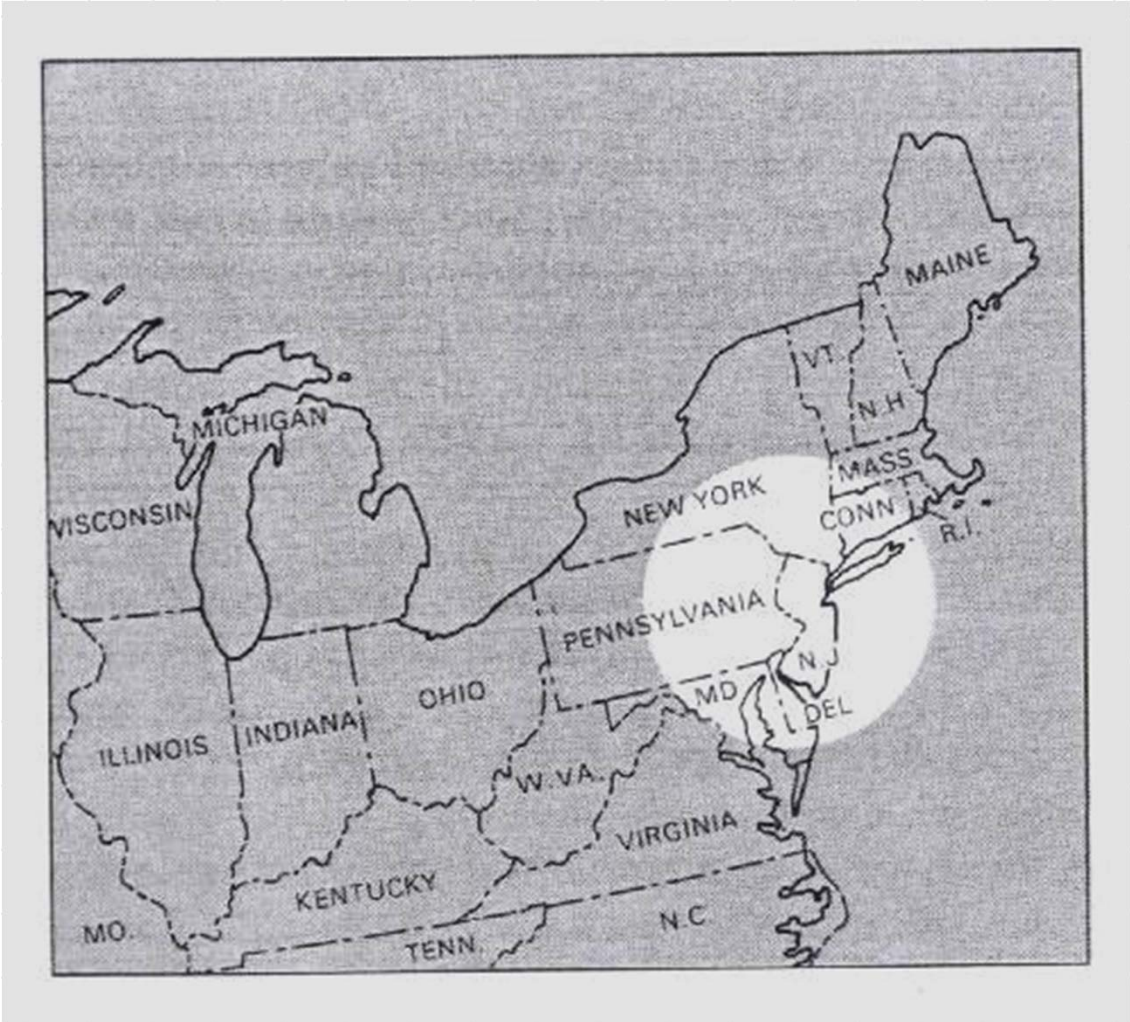
area contrast – variation of detail





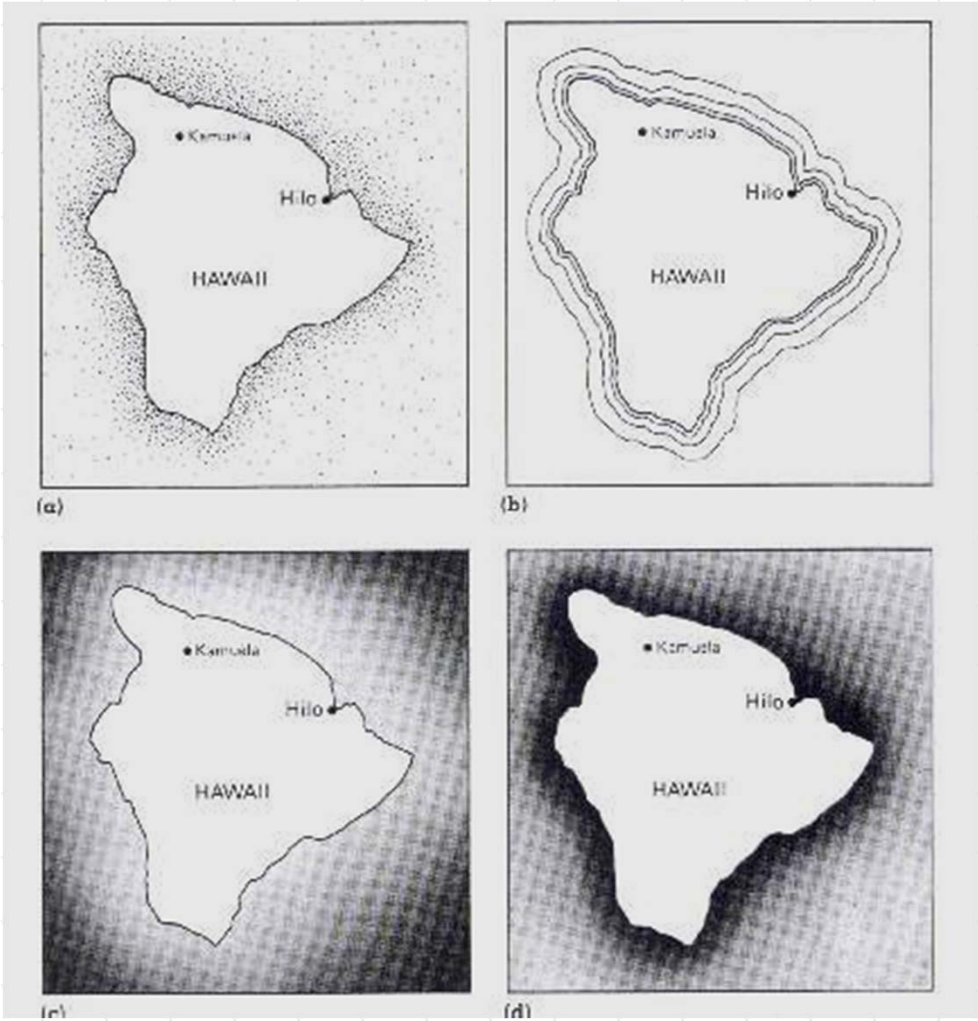
Contrast & Design

value contrast



Contrast & Design

value contrast



National Wildlife Refuges in Tennessee

Coordinate System: State Plane Tennessee FIPPS 4100
Datum: NAD 83
Units: Feet

0 25 50 100 150 200 Miles

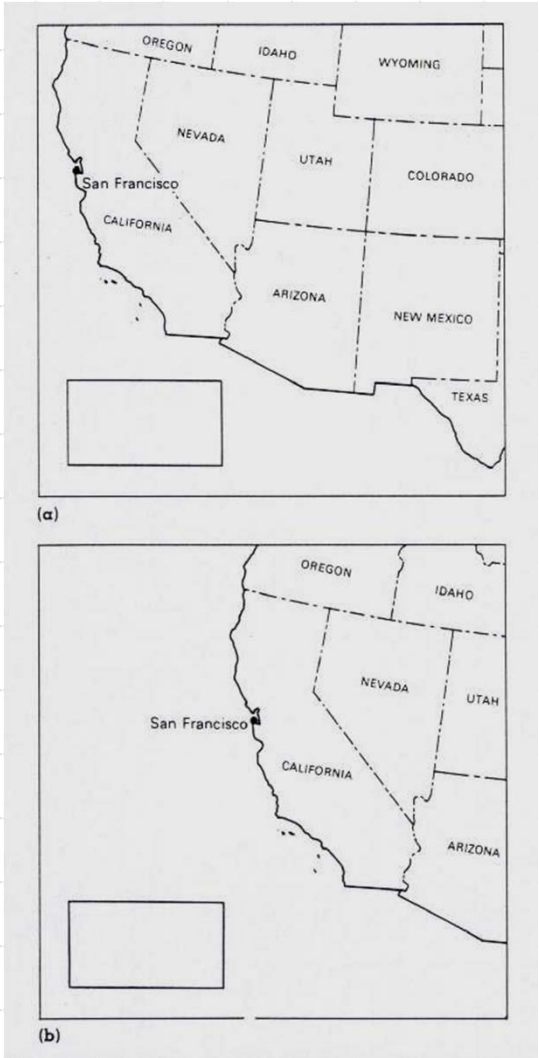
0 25 50 100 150 200 Kilometers

Map Production: Southeast Region GIS Center in Cookeville, TN
Map Production Date: September 11, 2012
File Location: G:projects/TN_NWR_map/tn_nwr_map.pdf

Cartographic Design Theory

- Figure - Ground
- Contrast & Design
- **Focus of Attention**
- Balance
- Internal Organization

Focus of Attention



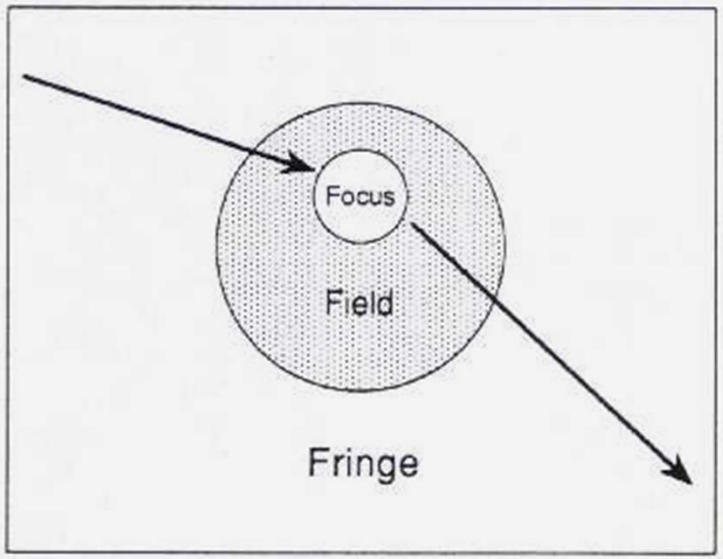


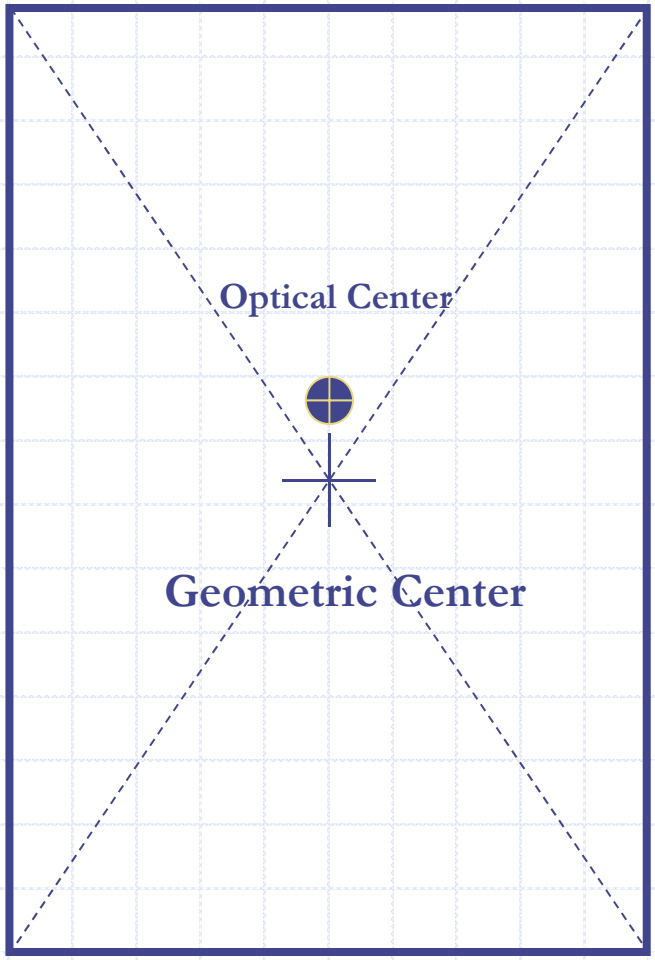
Figure 12.10. Eye movement through the image space. In normal viewing, the reader's eyes enter the image space at the upper left, proceed through the visual center (focus), and exit the space at the lower right. Cartographic designers may use this pattern when arranging the map's elements, so that the positions of important objects on the map correspond to natural eye movements.

Cartographic Design Theory

- Figure - Ground
- Contrast & Design
- Focus of Attention
- **Balance**
- Internal Organization

Balance

The two centers of an image space



The designer should arrange the map's elements around the natural (optical) center, rather than the geometric center.

Visual Balance

- An element's "weight" varies with location.

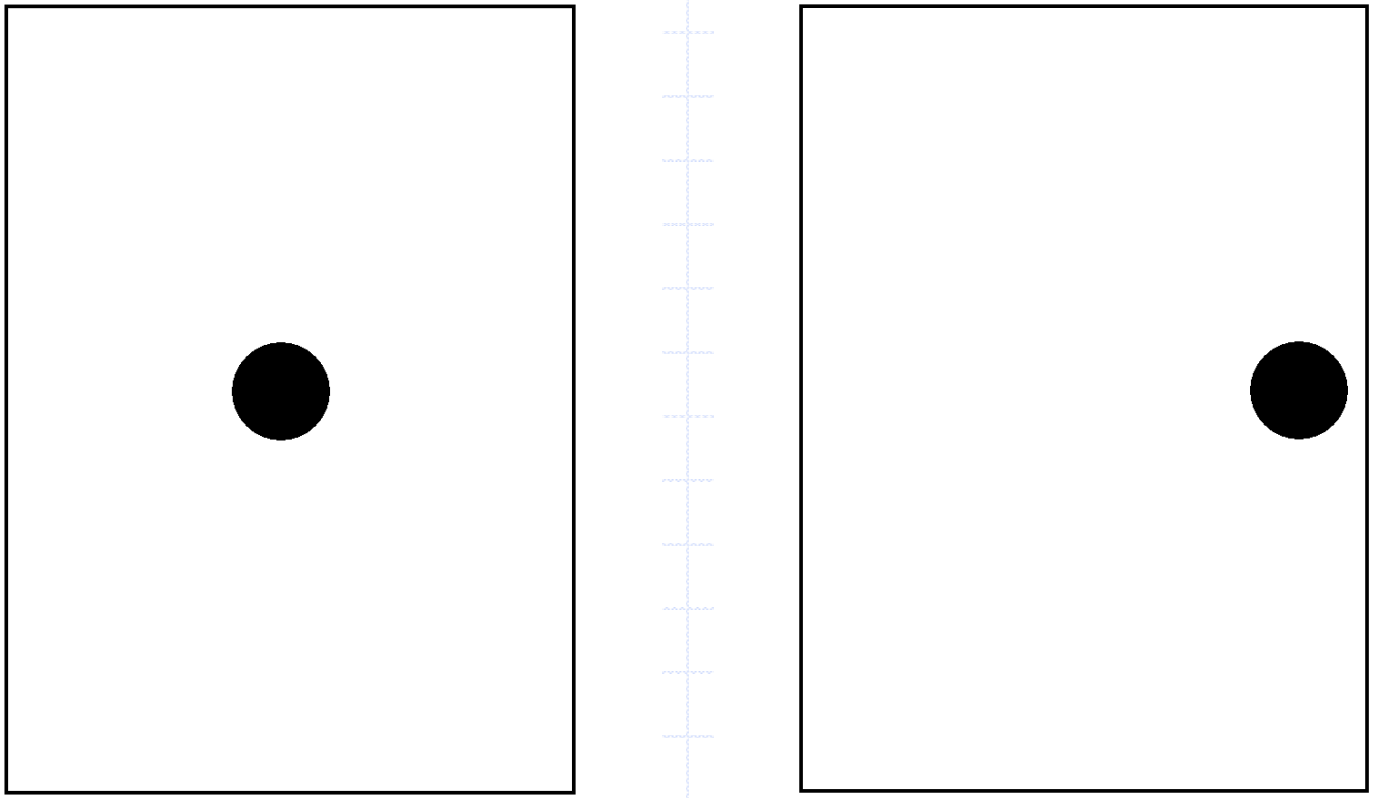
  Objects in center appear "lighter" than those near the edge

  Objects at the top appear "heavier" than those at the bottom

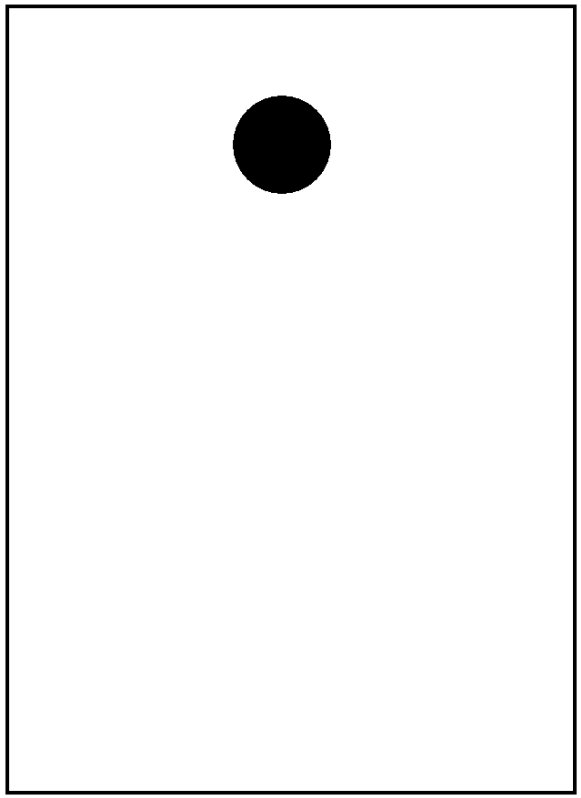
  Objects at the right appear "heavier" than those at the left

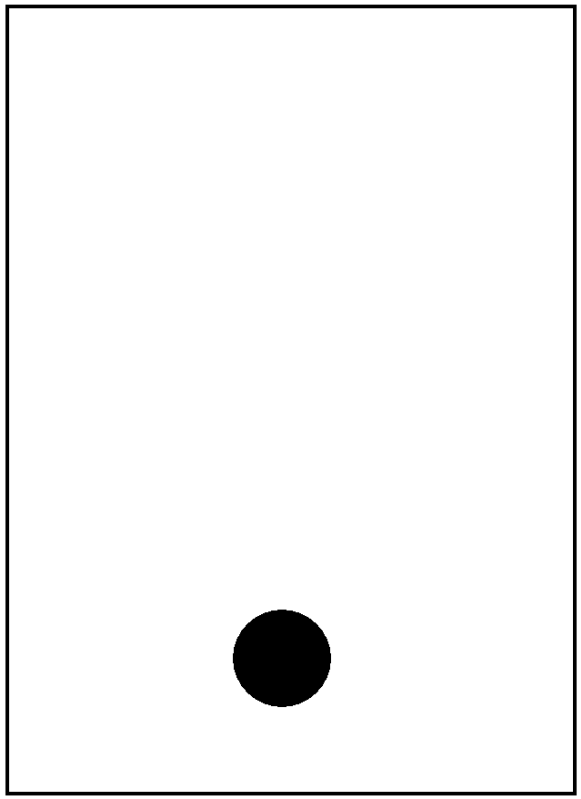
- The weight of an object varies in proportion to its distance from the visual center of the composition.

Visual Balance

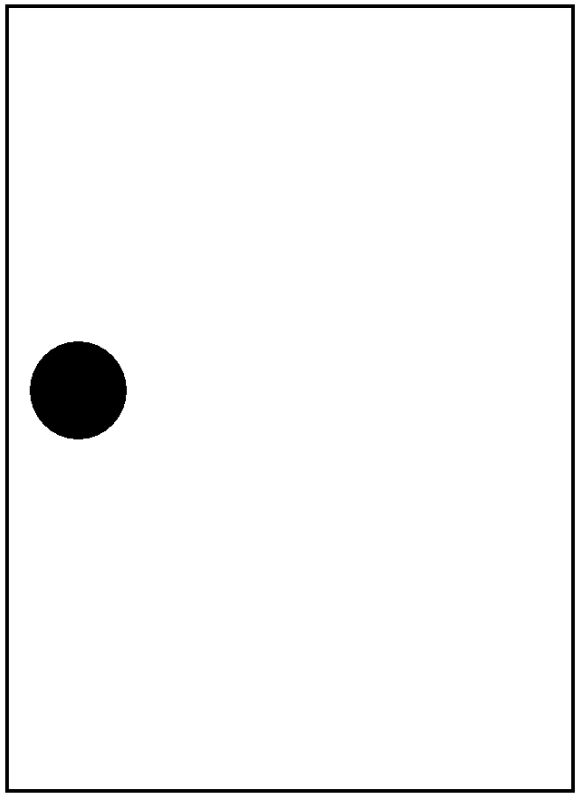


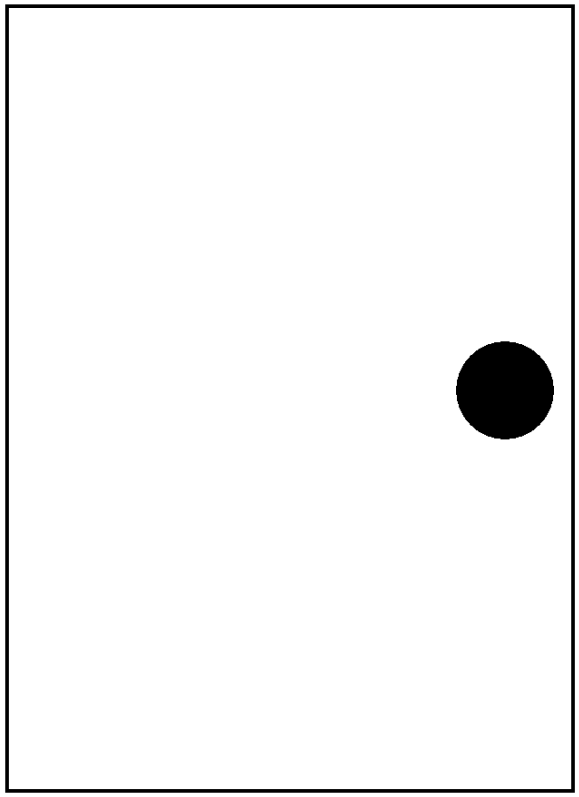
Visual Balance



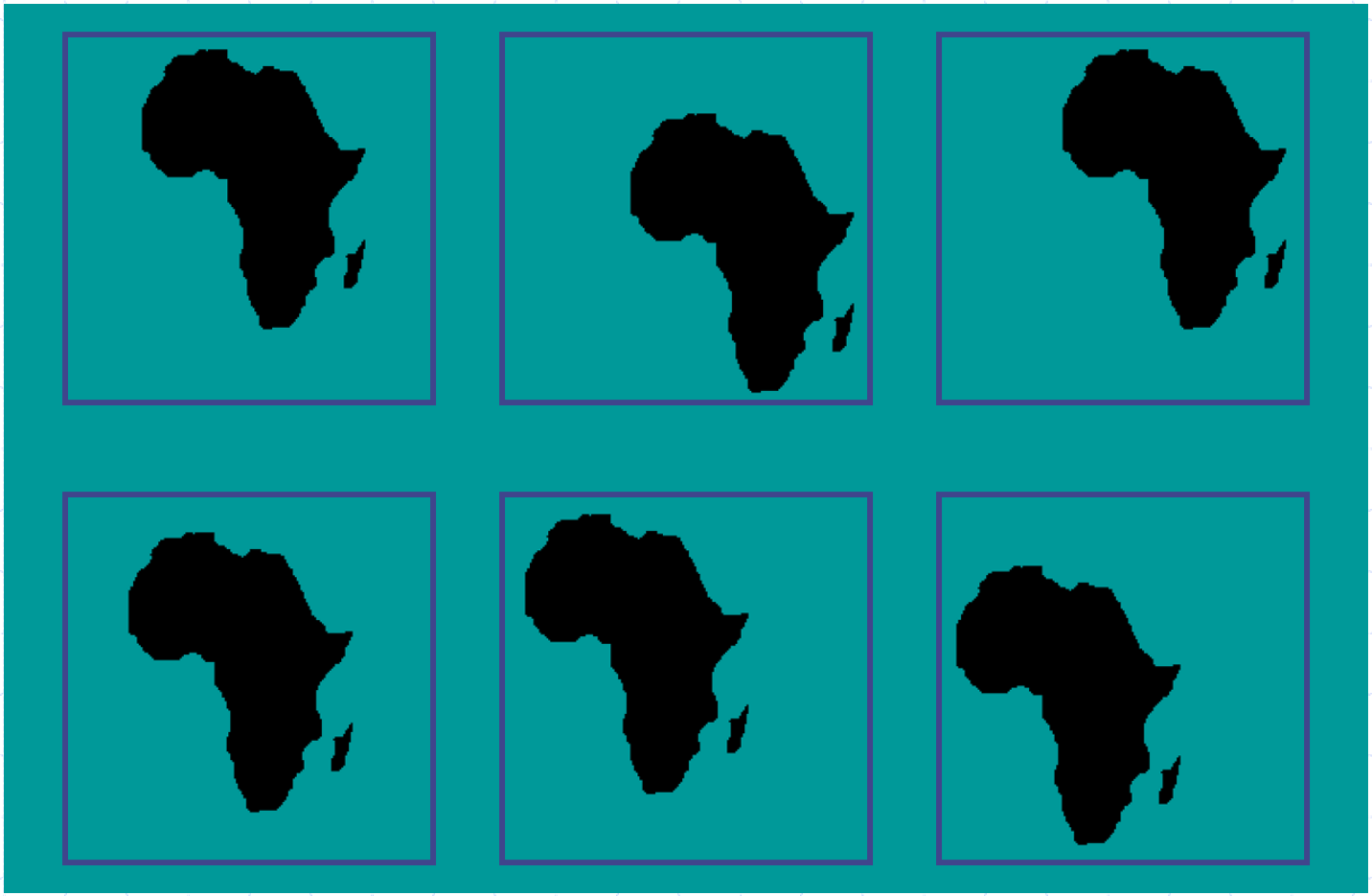


Visual Balance

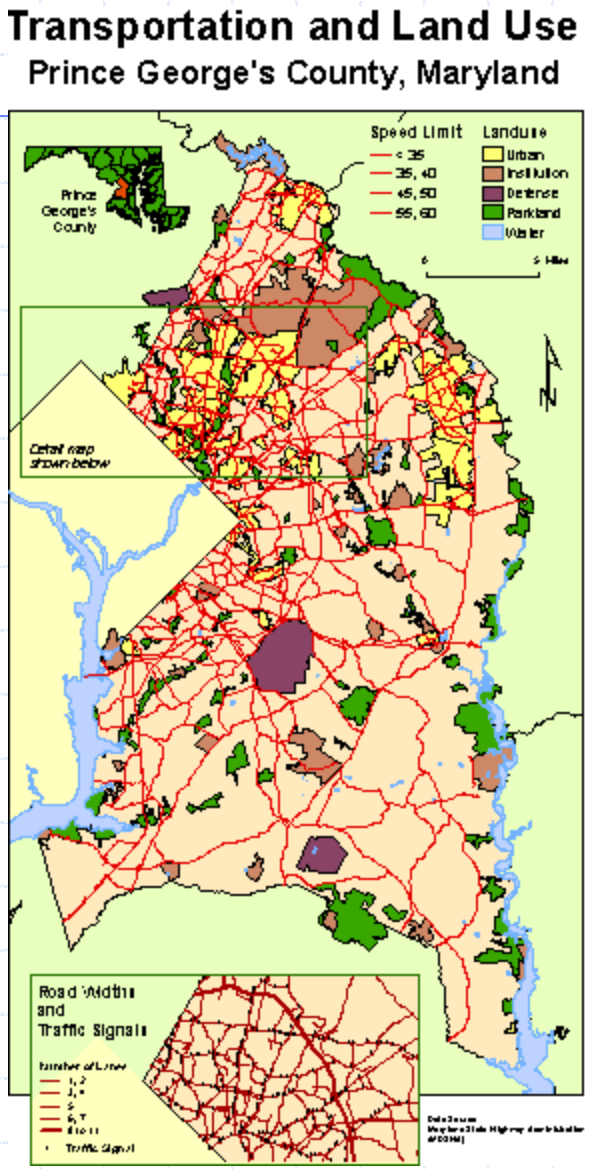


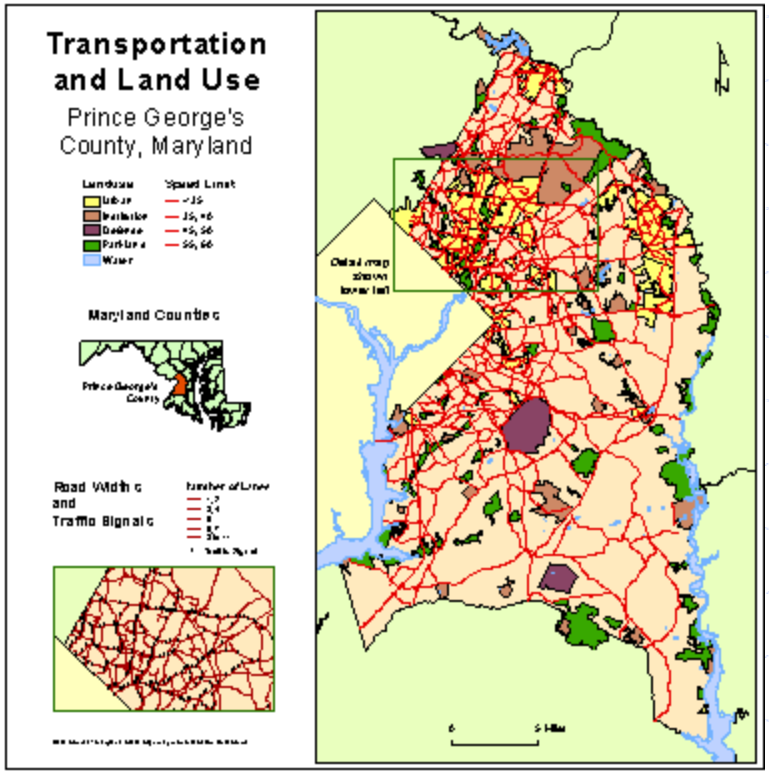


Visual Balance



Balancing Empty Spaces





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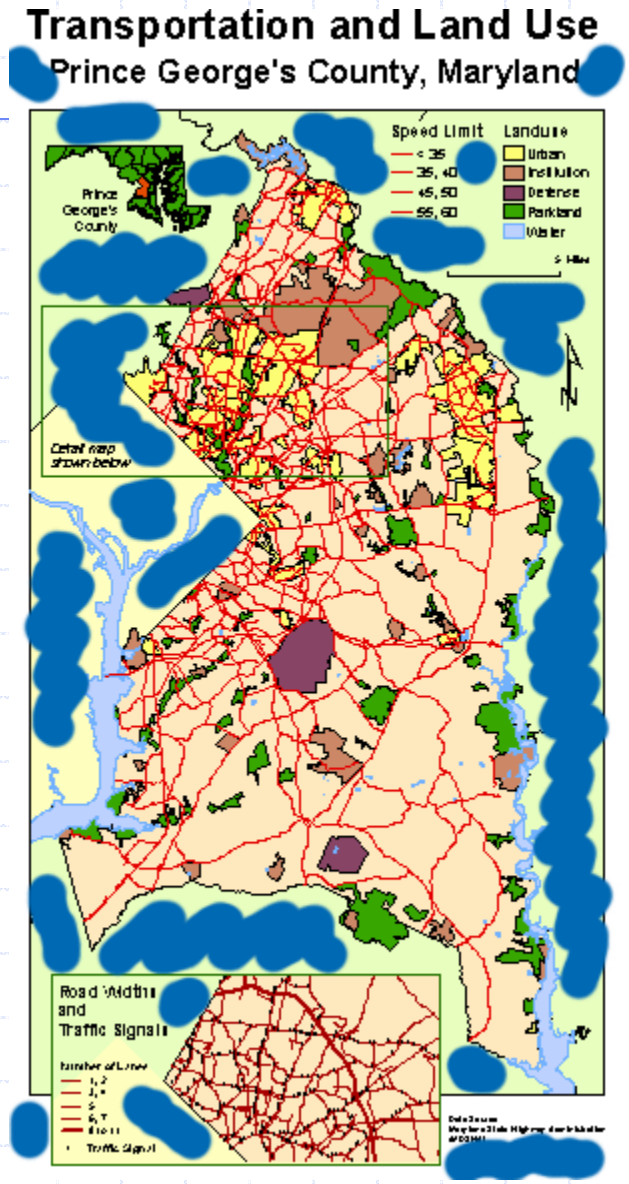
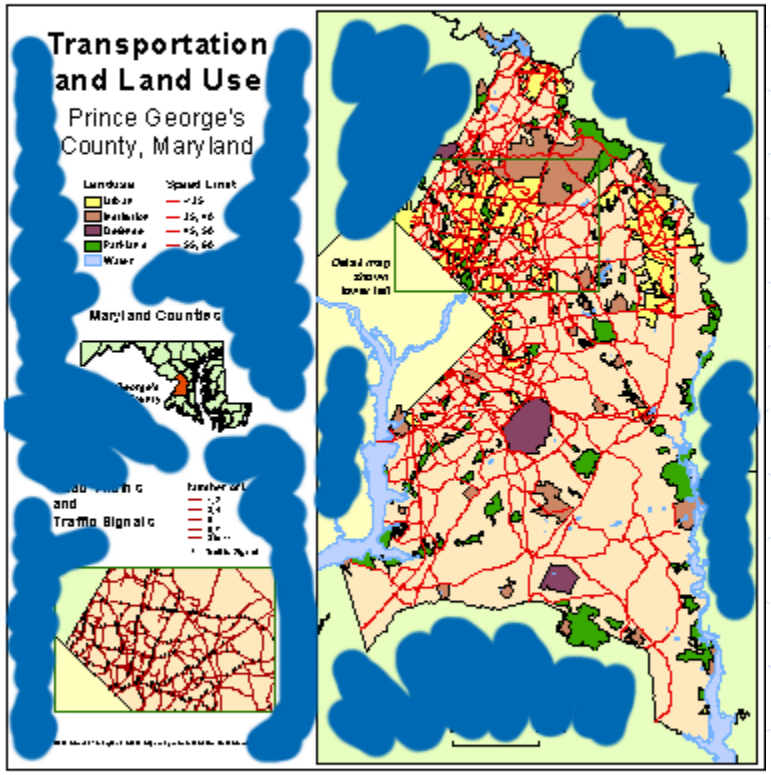


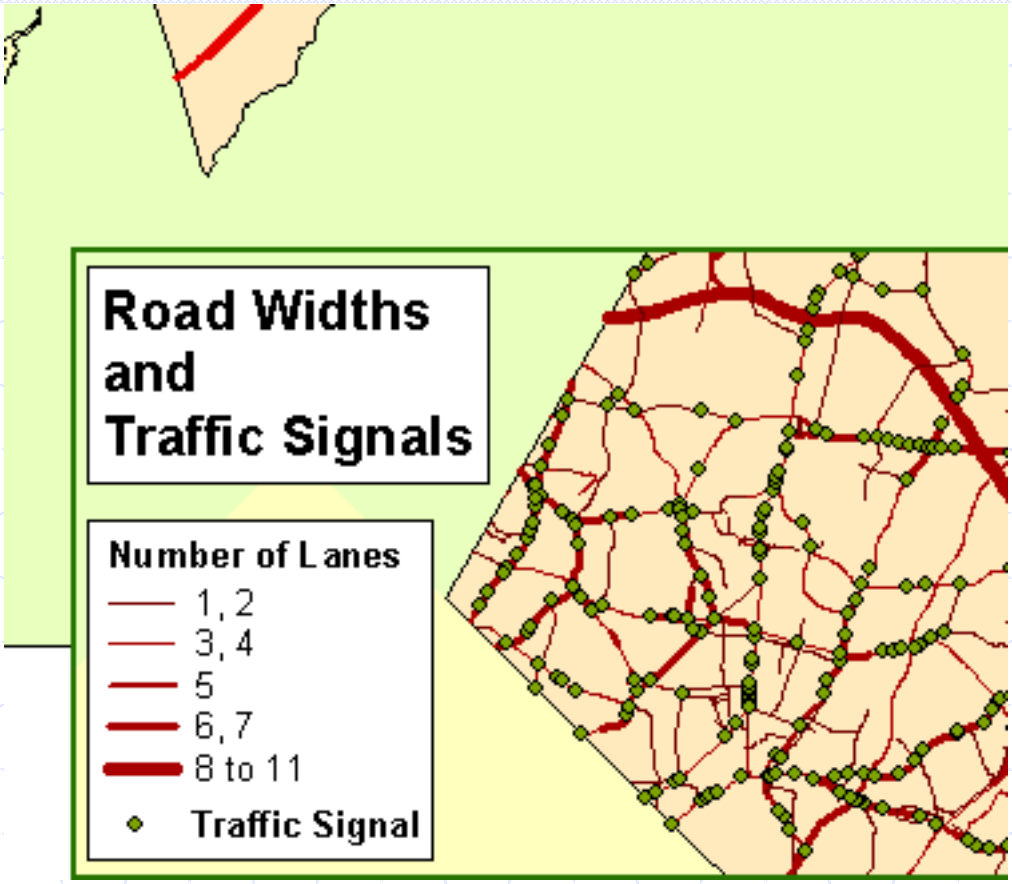


Balancing Tip

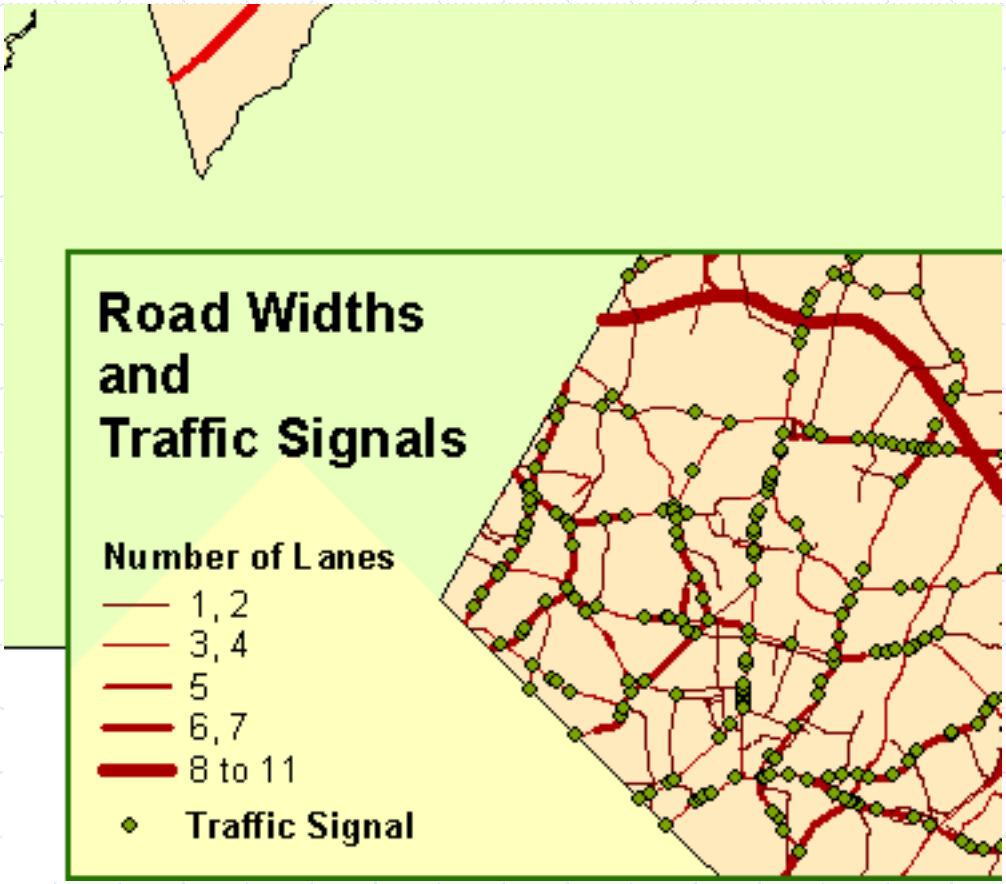
Don’t “box” everything ...

… it makes balancing more difficult and less interesting

Balancing without boxes



Tada!


Road Widths
and
Traffic Signals
Number of Lanes
1, 2
3, 4
5
6, 7
8 to 11
Traffic Signal

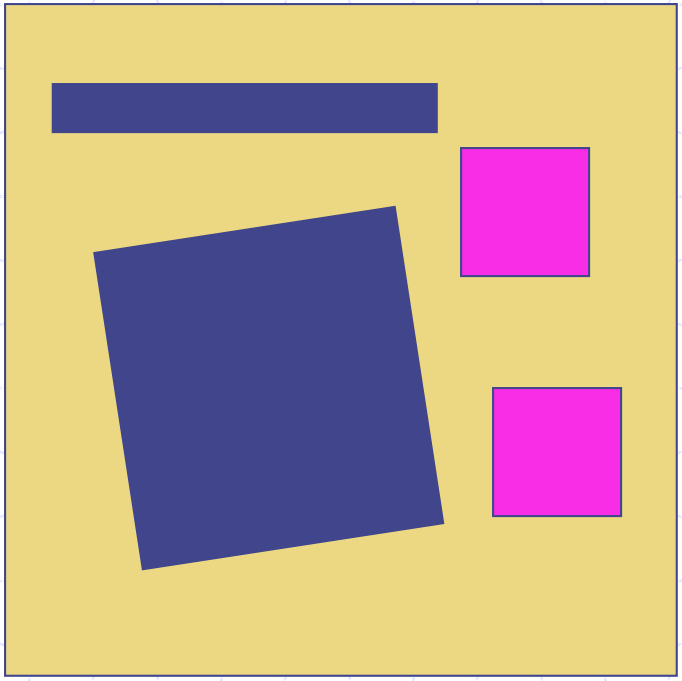
Cartographic Design Theory

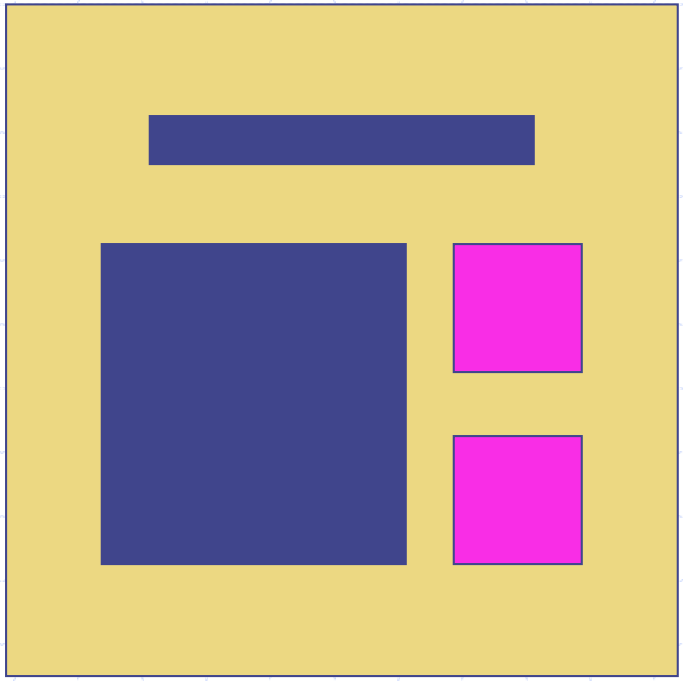
- Figure - Ground
- Contrast & Design
- Focus of Attention
- Balance
- **Internal Organization**

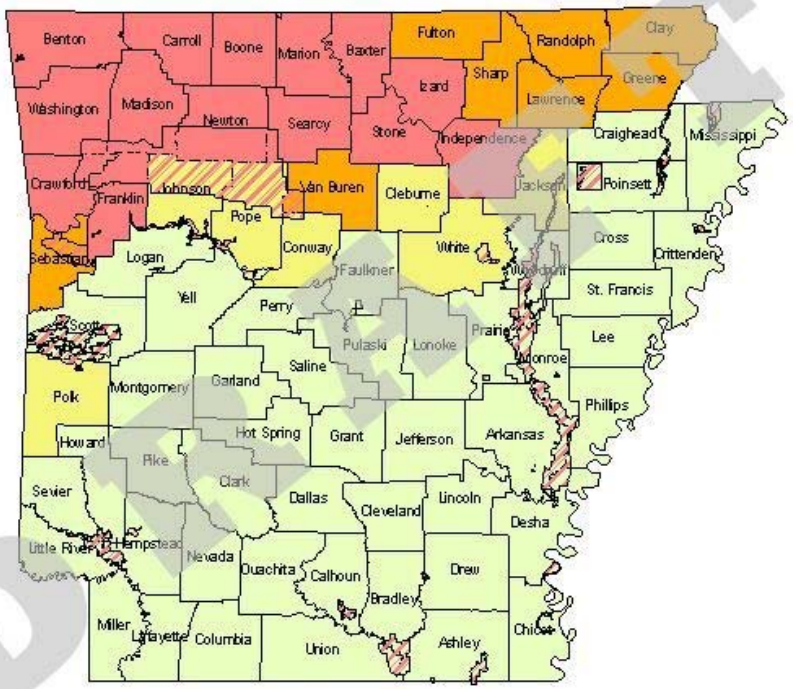
Internal Organization

- Gives structure to the graphic elements
- **Reduces tension**

Internal Organization







Potential Risk: BATS

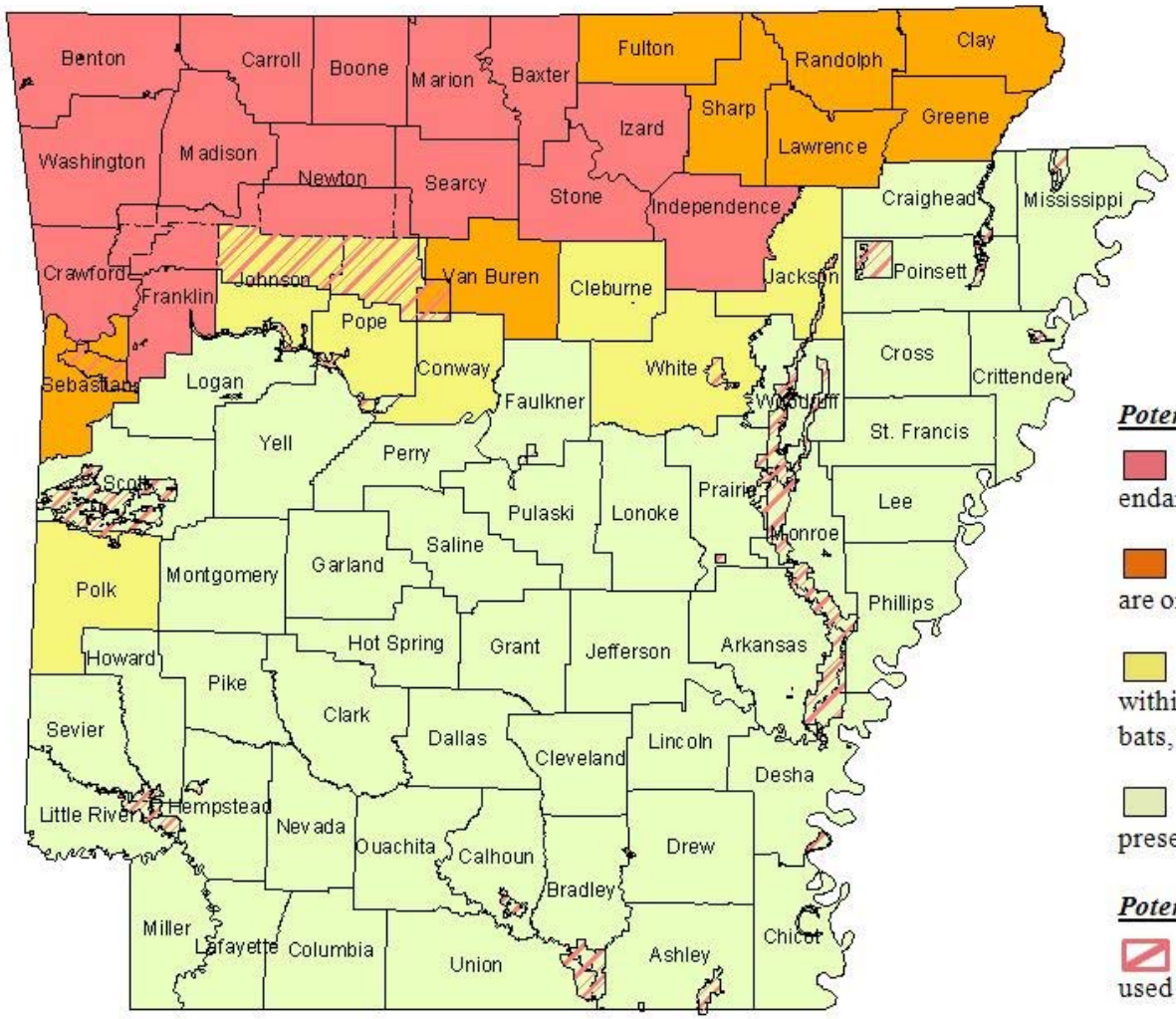
High	Important caves used by endangered bats are present in this county
Moderate-High	Endangered bats are or have been present in this county
Moderate	These counties are within the potential range of endangered bats, but none have been documented
Low	No known or predicted presence of endangered bats

Potential Risk: BIRDS

High	Important known habitat used by local and migratory birds

NOTE: The map above depicts potential risk (due to construction of wind farms) for endangered bats (by county) as well as local and migratory birds (known habitat areas). Proposed construction in a high risk county or known bird use area does not mean automatic termination of a project. Each project will be assessed individually.

Potential Risk to Endangered Bats and Migratory Birds from Wind Farms



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***Potential* Risk: BIRDS**

High - Important known habitat used by local and migratory birds

NOTE: The map above depicts *potential* risk (due to construction of wind farms) for endangered bats (by county) as well as local and migratory birds (known habitat areas). Proposed construction in a high risk county or known bird use area does not mean automatic rejection of a project. Each project must be assessed individually.

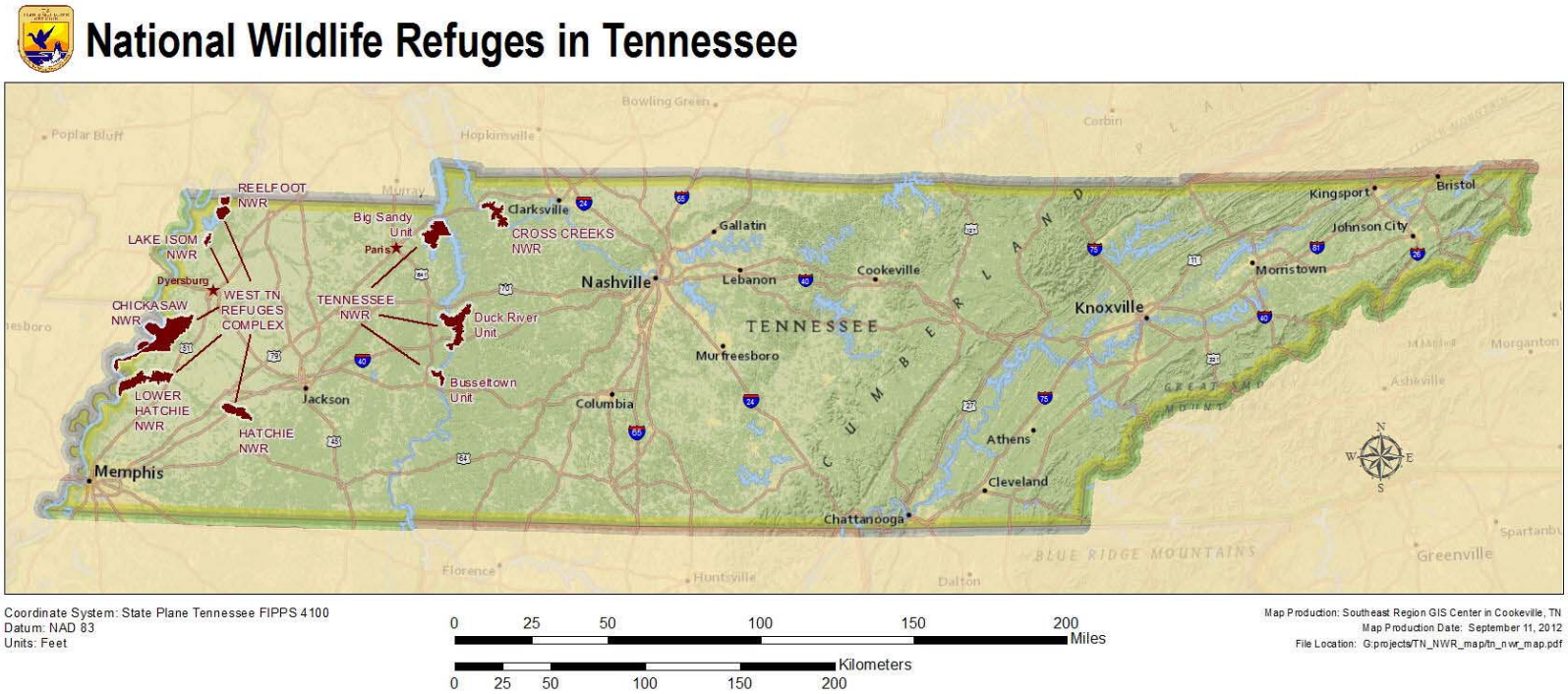
Some tips …

- EXPERIMENT...
- Cartography involves many “conventions”, design need not be one of them.

Final tip

Allow your map to be critiqued...

…it’s not as painful as you might think!

Tip or Trick

Using the erase and transparency tools to focus the attention of the user and create figure ground.