

County Cluster Districting Plan for Oklahoma State Senate*



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State Senate Districting Rules

Hard Constraints:

- Need to create 48 districts*
- Each district should be contiguous on the map*
- Each district population should be +/- 2.5% of ideal population*
- Ideal population is 81,935 giving bounds of 79,887 and 83,983*

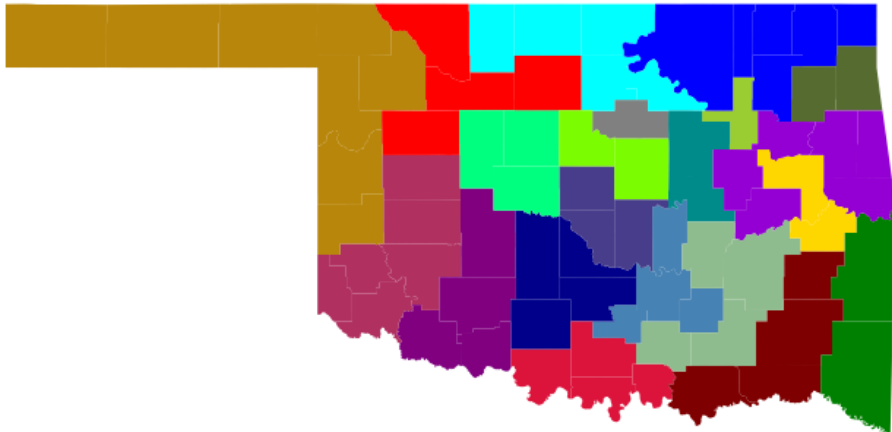
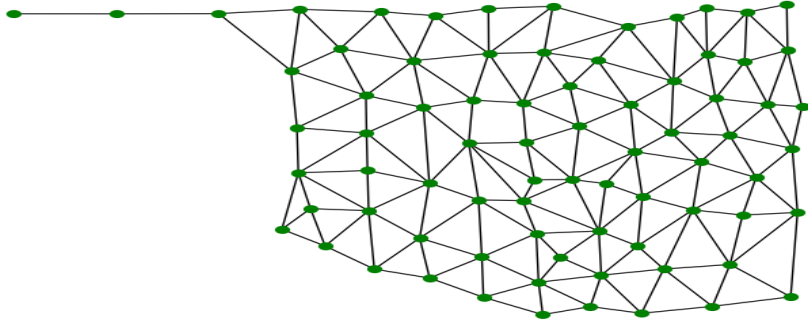
Soft Constraints:

- Compactness
- Preserve subdivisions (e.g., counties*)
- Preserve communities of interest
- ...

This is very hard to do well! Computational difficulty... Local knowledge...Tradeoffs...

*My approach will emphasize these aspects

Step 1: Group Counties into Clusters



Example clusters:

- {Payne} -> 1 district
- {Logan, Lincoln} -> 1 district
- {Tulsa} -> 8 districts
- {Blaine, Kingfisher, Canadian} -> 2 districts

Use optimization software to find 21 clusters (see map)

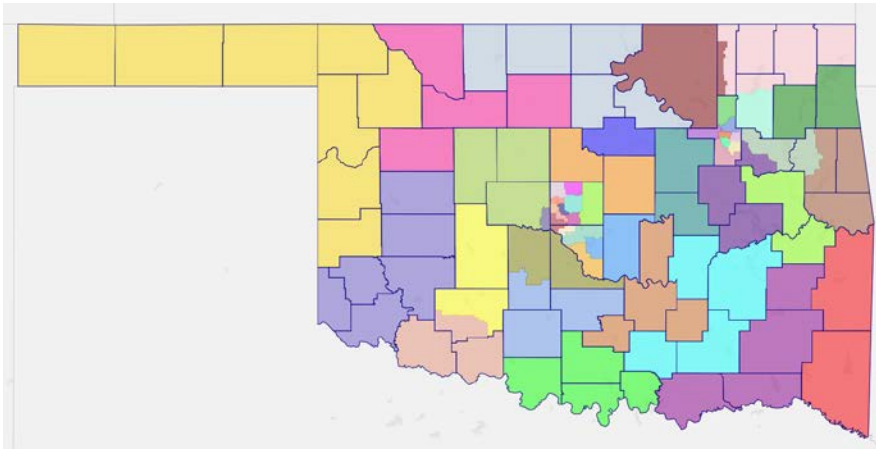
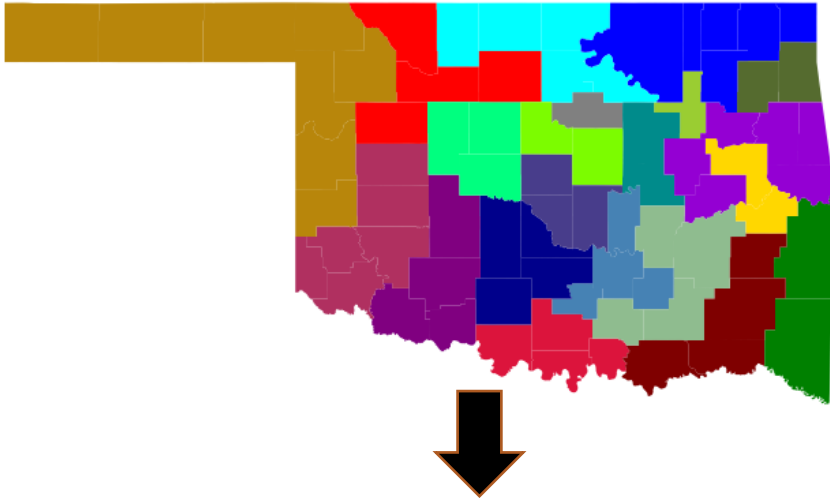
Software requires each cluster to:

- Be contiguous on the map
- Be made of whole counties
- Have population between 79,887 and 83,983, or a multiple thereof
 - Example: Tulsa County's population of 646,419 is between $8 \times 79,887$ and $8 \times 83,983$

Code here:

<https://github.com/AustinLBuchanan/OK-County-Clustering>

Step 2: Draw Detailed Plan for Each Cluster

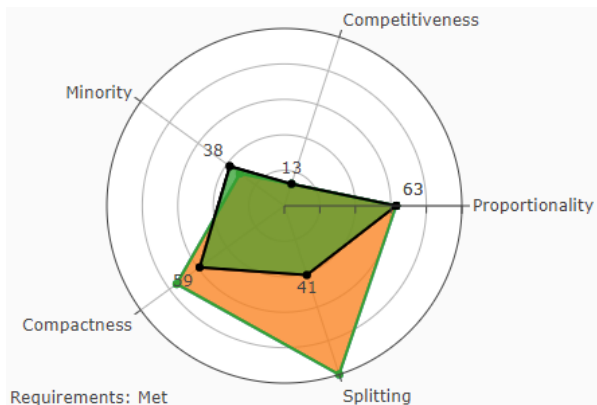


- Now, solve 21 “mini” districting instances
- Easier than solving one big instance
- I drew detailed plans for each cluster “by hand” with Dave’s Redistricting App
- I tried to keep districts compact
- My knowledge of communities of interest is limited!
- Better approach: work with public on step 2

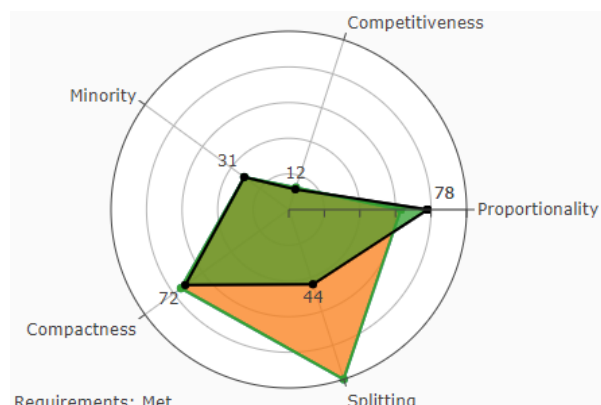


Comparisons – Strong showing w.r.t. Splitting

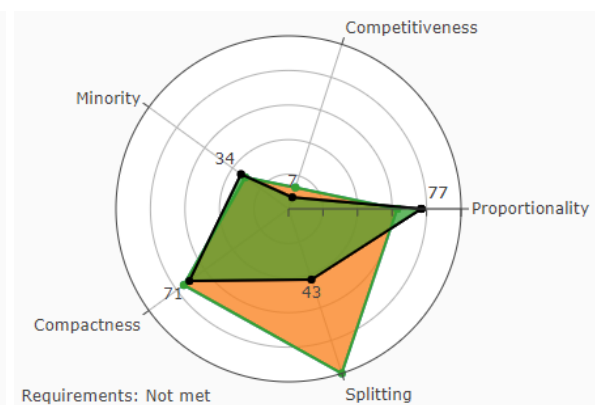
Public Map 1



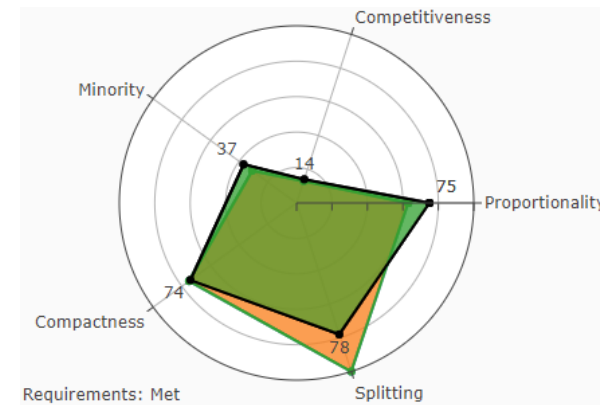
Public Map 2



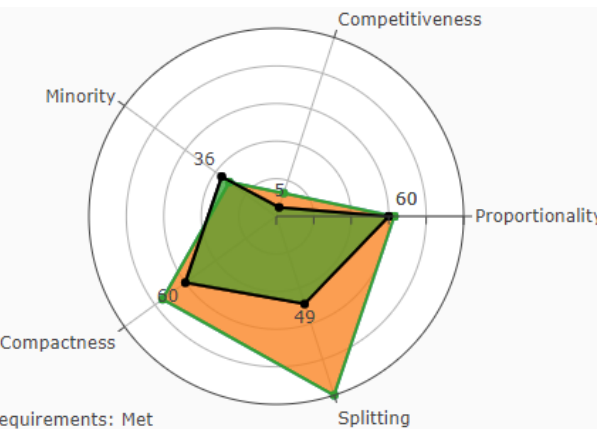
Public Map 3



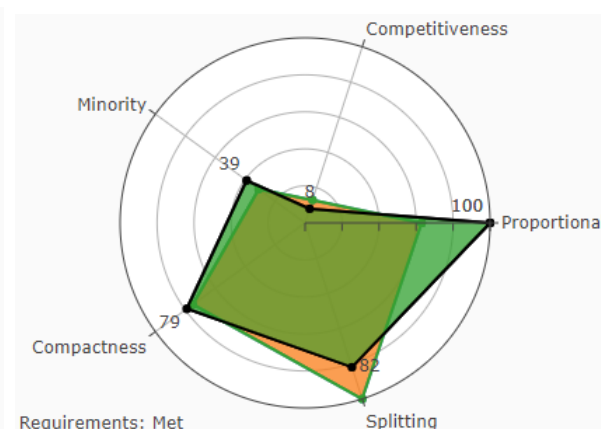
Public Map 4



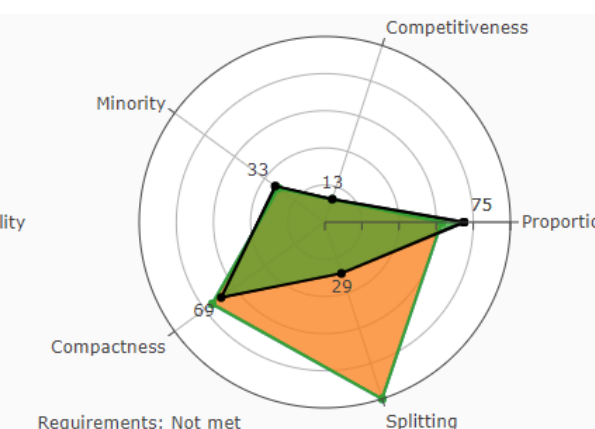
Public Map 6



Public Map 7



Public Map 8



Public Map 9

