SOC 4650/5650: PS-02 - Ambulance Districts in Springfield, MO

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Directions

Using data from the `Springfield.gdb` geodatabase, create a well-formatted map document that illustrates public safety infrastructure in Springfield, Missouri. Your entire project folder system, including data, map document, and output, should be uploaded to GitHub by Monday, February 12th at 4:15pm.

Scenario

For this assignment, you are asked to take on the role of a public safety planner for CoxHealth, one of two EMS providers for Springfield. CoxHealth's EMS operations staff have asked you to locate and map public schools in their two response zones in the city to assist in pre-planning for a major incident. You will also want to include the locations of other public safety resources including fire and police stations.

Analysis Development (Review from Lectures 01 and 02)

1. In your course folder system, find the `ProblemSets/PS-02` subdirectory.

2. Add folders within it called `data`, `docs`, `maps`, and `results`.

3. Copy and paste the data file `Springfield.gdb` from the course `Data` folder into `ProblemSets/PS-02/data`.

4. Go through this assignment and make a plan for what data is needed. Remove any unneeded data from your geodatabase before proceeding. This helps keep the size of your assignment repository as small as possible!

Part 1: Create a Basemap

5. Create a save a new map document to your `maps` subfolder. Make sure that you set the "relative paths" option.

6. Rename the data frame to "Basemap".[1]

7. Add the following layers to your map from `Springfield.gdb` in the order listed below and symbolize them with the given attributes:

   (a) City Boundary - no fill, Dark Umber outline with width = 1.6

   (b) Schools - Use the "School 1" pre-set symbol

   (c) Street Centerlines - Gray 70% with width = 0.2

   (d) City Boundary - White fill, no outline

   (e) County Boundaries - 10% Gray fill, 50% Gray outline with width = 0.4

8. Turn labeling on for the *top* city boundary layer. Use the `NAME` field. Use the "Country 3" pre-set label and add the halo effect.[2]

9. Zoom to the city boundary layer.

10. Export the map as a `pdf` file at 300 dpi.

[1] *Hint:* Double click on the data frame name.

[2] *Hint:* Use the Symbol... button to access these properties.

Part 2: Map Public Safety Resources

11. Add a new data frame to your map document and name it "Public Safety".

12. Copy and Paste all of the layers from your "Basemap" data frame into the "Public Safety" data frame. Re-order layers if necessary so that they follow the order specified in question 7.

13. Add the public safety stations layer from `Springfield.gdb`. Place it directly below the *top* city boundary layer and symbolize based on type (fire or police). In the Symbology tab, choose Categories and then Unique values. For the Value Field select `CLASS`, then click Add All Values. Un-check <all other values>. Double click on the Symbol for `FIRE`, and use the "Circle 2" pre-set symbol. Change its fill to "Mars Red" and its size to 8. Click OK and then double click on the Symbol for `LAW`. Use the "Circle 2" pre-set symbol but change its fill to "Cretan Blue" and its size to 8.

14. Add the EMS districts layer from `Springfield.gdb`. Place it directly *below* the street centerlines layer and use a `Definition Query` to select only the polygons that represent CoxHealth EMS's response area. The query should look like this: **"AGENCY"** = **'CX'**. Symbolize this layer using the "Rose" pre-set symbol.

15. Zoom to the city boundary layer.

16. Export the map as a `pdf` file at 300 dpi.

Part 3: Map Schools in CoxHealth EMS's Northern Response Area

17. Add a new data frame to your map document and name it "Response Area North"

18. `Copy` and `Paste` all of the layers from your "Public Safety" data frame into the "Response Area North" data frame. Re-order layers if necessary so that they follow the order specified in question 7.

19. Zoom in on the northern response area (towards the "top" of the mpa) for CoxHealth EMS. You can zoom in past the edges on both the east and west sides of this area where there are no schools to maximize your view of where schools are located.

20. Make the schools layer the only one that is selectable.

21. Select all of the schools within CoxHealth EMS's northern response area and create a new layer symbolizing only those schools. This new layer should be positioned directly above the original schools layer and should be symbolized with the "School 2" pre-set symbol with an "Electron Gold" fill and size = 24.

22. For the schools that are in the northern response area, label them with the `NAME` attribute and add the halo effect.

23. Export the map as a `pdf` file at 300 dpi.

Part 4: Follow-up Questions

Save a new text document with a `.md` file extension in your `docs/` folder. In this Markdown file, answer the following questions:

24. What type of *spatial* data is the school layer?[3]

[3] *Hint:* By spatial data, we mean point, line, or polygon.

25. What type of *tabular* data is the NAME attribute on the schools layer?[4]

26. What level of measurement is the NAME attribute on the schools layer?[5]

27. Based on the third map, are there fire department resources nearby the schools in the northern part of the city? What schools might have the *longest* response time from a fire station? What schools might have the *shortest* response time?

[4] *Hint:* By tabular data, we mean string or numeric.

[5] *Hint:* By level of measurement, we mean categorical, ordinal, or continuous.