

In this exercise you will demonstrate and apply your understanding of census data and the fundamentals of mapping with quantitative data – and continue practicing describing spatial mechanisms in a landscape of data and decision-making. Consult the tutorials [About Census Data](#), [Mapping Census Data](#), [Elements of Cartographic Style](#) and [Mapping with Quantitative Data](#) for references to useful ArcMap techniques. [See Example Map](#).

Checklist:**10 Points Possible.**

- _____ Consult the tutorial on [Describing and Simulating Spatial Mechanisms](#). Dream up a HYPOTHETICAL decision-making context where the creation or removal of a thing or condition may have an effect of Exposure or Accessibility of local population. Be sure to mention the actual spatial mechanism and intermediate conditions through which the exposure or accessibility is expected to be realized. **Choose a spatial mechanism where the impact or the accessibility is exhausted in less than one kilometer (e.g. a person walking, or the home range of some hypothetical insect.) If your study areas is rural, you may go to 2 km.** It would be completely OK to re-use your spatial mechanism from last week's map.
- _____ Create a map with a having a three-level hierarchy. Your reference framework should overlay vector data sources for **ALL roads**, and MassGIS 1:25k hydrography. Choose a scale and extent to feature the extent of the impacted area and its immediate context. Use green outlines for Open-Space. At the top level of your map, use tools on the Draw Toolbar to add a labeled spot indicating the location of your proposed facility and a polygon indicating a conceptual diagram of the area affected. [Convert your polygon graphic to a shape file](#). Portray this polygon as a outline only (no fill),
- _____ In the background of your map, show the 2010 Census Blocks shaded by Population Density using the 100% Count Block-level Population Counts from the 2010 census. Make sure that your legend and text are clear about the aerial units (tracts, block groups or blocks) and the normalized units used in your individual legend classes (e.g. Residents per Hectare.) Headings must be clearly understandable by a person who is not familiar with the data. Instructions for downloading census data are in the [About Census Data Tutorial](#)
- _____ Use five legend classes, chosen carefully to break at nice round numbers. Avoid lumping together intuitively dissimilar blocks, tracts or block-groups. In most cases the lowest category should indicate polygons that have zero population. Warning: failure to normalize correctly costs 5 points!
- _____ Use the techniques outlines in the [tutorial that covers the Select and Summary technique](#) to estimate and discuss the number of people counted in the blocks that have a spatial relationship with your polygon.
- _____ Save the selected census blocks as a new layer and give them a more vibrant outline, so that we can see the outline of the impact/accessibility area and the associated census blocks at the same time. It may take some fiddling to illustrate how the relationship of the impact/accessibility zone with the selected block groups.
- _____ IN the foreground of your map hierarchy, label your impact/ accessibility area and provide a summary of the 2010 total population and count of housing units of the blocks that fall within the area.
- _____ The caption of your density map should discuss the population density in your hypothetical impact/accessibility area, and mention the estimated number residents associated with that area. Discuss why the location you have chosen may have some particular exposure/accessibility effect extending across the landscape in the area that you depict
- _____ Be sure that your caption pays proper attention to the data-source and critical aspects of its collection methodology. . [Consult the page on evaluating data in decision-making context](#) for advice on this.
- _____ Your maps should include all of the essential elements of a map as discussed in [Elements of Cartographic Style](#), with the technical aspects of Titles, Captions, [Scale Bar](#), [source citations](#) and [declare your projection case](#), as discussed in the check-list for the second exercise. You can skip the attribution for your base data layers, but please include a long citation for the census data-set that you have used.
- _____ Design your layout for legible reading at letter size, landscape format. Export a PDF file named:

your_username_density.pdf and upload to the course web site..