Fundamentals of GIS: **Transforming and Mapping Categorical Data**

In this exercise you will demonstrate and apply your understanding of the ideas and techniques described in the tutorial, Mapping with Categorical Data. Evaluating Data in Decision-making Context, ArcMap101 tutorial, Nuts and Bolts of Mapping, and Elements of Cartographic Style, Describing Spatial Mechanisms in Decision-Making Context

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 in the surrounding area. Be sure to mention the actual spatial mechanism and mediating conditions (wind, corridors, barriers) through which the exposure or accessibility is expected to be realized. Choose a spatial mechanism where the exposure or accessibility effect is exhausted in less than one kilometer (e.g. the range of a pedestrian, or the home range of some hypothetical animal, or the area that may be affected in a physical way by the change in question.) If your study areas is rural, you may go to 2 km. If elevation is involved, you are welcome to use contours form MassGIS.

_____As usual, your map should focus on one location where change may be happening and should not cover much area outside the context of the area of interest.

_____ Use massgis data that you have collected yourself (**Mastery track**) to 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, and protected open-space. Choose a scale and extent to feature the extent of the impacted area and its immediate context.

_____ In the reference level of your hierarchy label a few major roads and a local landmark that will help us understand and discuss the setting for your hypothetical situation. Turn off needless road labels! Your map should cover your spatial effect and its immediate surroundings but not much more. 4kmx4km?

_____ Download and explore the MassGIS 1999 land use and extract the features within your context area into your collection. Don't forget the metadata! Think about how you would characterize your land use with 8 or fewer categories. Which categories you choose depends on your decision-making scenario and the sort of place you are looking at. **B Track:** can use the data provided in the sample data-set.

_____ The caption of your map should discuss the change that you propose and the spatial mechanism that relates your change to the ACTUAL THINGS and conditions that may or may not be well represented by land use observations that are reflected in your data-set. Hint: think about the methodology behind the original observations and the sorts of omission and commission errors that you would expect with regard to the ACTUAL touchable smellable, visible, things and conditions of concern. Your caption must discuss the observation/categorization methodology and resulting lumpiness of the land-use data. Discuss specific places in the map and label them.   Use diagramattic graphics to indicate the way that the exposure or access actually works.

_____ **Mastery Track*:** Follow the steps discussed in the Mapping Categorical Data tutorial to modify the lookup LU21_LUT.dbf table provided with the sample data-set to transform the MassGIS land use codes to your new simplified category scheme with seven classes or fewer. Your reclassification should characterize the 1999 land use of in the area around your hypothetical situation subject area. **Your custom category scheme should be saved in a field that includes your initials.** Try to avoid hiding interesting distinctions of land use in overly broad categories. **Do not** include any land use categorized as "Other" in your map.

_____ **B Track:** Skip the lookup table requirement. use the ArcMap legend editor to group and prune legend categories.

_____ Choose land use shades based on **conventional land use shades** as discussed in Elements of Cartographic Style. Your legend should include no more than 8 land uses. Choose the legend headings and labels so that they are meaningful to a person who has no knowledge of the datasets involved. **No cryptic file names, field names or legend labels or headings should appear on your map**.

_____ _Be careful about the MassGIS **Urban Open** Category. Use the Protected Open Space layer as a better representation of recreational open space._

_____ _Click the "Count" heading in the Categorical Symbology properties of your categorized land-use layer to eliminate land uses classes that do not appear on the map._

_____ **Arrange your graphical hierarchy to Colorize the aerial photo with land-use shades** as explained in the categorical mapping tutorial. At this scale it can be nice to adjust the width of your roads so that they are approximately as wide as the roads in the aerial.

_____ Include all of the essential elements of a map as discussed in Elements of Cartographic Style, with the technical aspects of Titles, Captions, properly incremented scale-bar and declare your projection case, as discussed in the check-list for the second exercise. You can skip the source citations for the base-layers that you cited on your base map. If one of these layers represents one of your things or conditions of concern, provide a short citation.

_____ On a second page of your project: **Mastery Track:** include a screenshot of **your lookup table** showing your own category scheme with your initials in the field name, along with the original 21 MassGIS land use categories. **B Track:** instead of your look-up table you can include a screen-shot of the Symbology properties showing how you have lumped categories together.

_____ Include a caption on the second page that describes the recategorization that you applied and the **one or two** ideas about challenges presented by the generalization.

_____ Use a word-processing or slide-show production tool to create your two-page layout designed for easy reading at letter size, landscape format. Include your map, exported from ArcMap as JPGs at 300dpi.