

This exercise provides an opportunity to practice and demonstrate your understanding of modeling proximity with vector-relational GIS tools. You will create a re-useable model using two or more of the common tools of vector-relational association: [Select Layer by Attribute](#), [Select Layer by Location](#), and [Buffer](#). Optionally, you may also try a [Spatial Join](#). Your model will result in a map and **two summaries** that you extract from your model using [Summary Statistics](#). You may use other tools if you want. **The object of this exercise is not merely to create a map but to derive new data to make a comparison.** You are welcome to use data from [this week's tutorial](#) data-set. You may even re-use the models -- just don't repeat the example from the class demonstration. [See sample project](#).

**Checklist:****10 Points Possible.**

- \_\_\_\_\_ Invent a [hypothetical decision-making situation](#) involving the creation or removal of a new facility and the resulting changes in a plausible but hypothetical exposure or accessibility condition for local residents. Describe the critical elements and relationships of your situation in terms of a conceptual model. Be sure to describe the actual spatial mechanism that you are going to attempt to model with GIS. Do not forget to discuss the mediating conditions that would determine the realistic extent of your accessibility or exposure condition.
- \_\_\_\_\_ Your analysis will begin with a data-set representing an existing set of facilities (some sort of commercial or service location, or maybe playgrounds.) within a limited study frame. Follow the instructions [in this week's tutorial](#) to create a geoprocessing model to select the 2010 Census Blocks that are spatially related to your proposed facilities and to summarize the estimated population and housing units affected.
- \_\_\_\_\_ Then alter your model to simulate the overall accessibility or exposure with all facilities selected except for one. And run it again to discover the impact on accessibility of the entire system with one or more facility removed. See the example **Simple Select and Sum** model in this week's tutorial data-set. **Optional:** If you want to investigate a scenario that simulates the addition a new facility, see the instructions in the [Creating an Experimental Scheme](#) tutorial
- \_\_\_\_\_ Illustrate your model with one or two maps that present the summary of population and housing units affected by Scheme A and the change scenario. IN each map, develop a [three-level graphical hierarchy](#) that includes all roads with their own hierarchy, hydrography, open space, town boundaries.
- \_\_\_\_\_ The background of your map should represent population density with an appropriate legend. Review the [Census Mapping Tutorial](#) and [Mapping with Quantitative Data](#), if necessary.
- \_\_\_\_\_ At the top level of your graphic hierarchy, use intuitive spot symbols or other graphics to show the locations of the facilities you are focused on. Highlight and label the proposed facility removal or addition. Use your Buffers and layers of selected blocks to indicate simulated accessibility/exposure areas and the extents of the associated census areas under the existing and the proposed scenarios. include a summary of the population and housing units associated with the original scenario and for the difference.
- \_\_\_\_\_ Criticize your model results in terms of the [fitness of the data](#) as a representation of "population affected," and your use of buffers as a simulation of the [spatial mechanism](#) described in your decision-making situation. Mention a couple of the critical differences between these abstractions and the real-life things, conditions and relationships that you are concerned with. Would you consider your answers more likely to be an over-estimate or an under-estimate? Why? Do not go into details of things and conditions that you are not attempting to model.
- \_\_\_\_\_ 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-bars](#), [source citations](#) and [declare your projection case](#), as discussed in the check-list for the second exercise. Cite sources for your census data and the data you are using as your base facility scheme.
- \_\_\_\_\_ The final page of your letter-sized, Landscape-orientation document include a screen-shot of your model with a very short explanation of how it works.
- \_\_\_\_\_ Name your file **yourname\_vectormodel.pdf** and upload it to this week's assignment dropbox..