Instruction for USP 570 Modeling Exercise

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In this exercise you will get hands-on experience of applying models in planning process by working with a land use - transportation interaction (LUTI) model, SmartGAP, for a scenario planning exercise. We will use the data and model for Multnomah County, which is shipped with the SmartGAP program as the "Demo Project". The Multnomah County project is set up to run from 2005 to 2035.

Requirements

1. Using knowledge you learn from this and other courses, as well as your experiences as a resident and a planner, define a set of long range planning goals for Multnomah County. Using the Metro's 2040 vision to inform your goals; you don't need to be comprehensive or exhaustive.
2. Now run the base scenario, examine the Outputs and Metrics in the planning end year (2035), and materialize the goals you defined in step 1 into specific objectives. For example, safe neighborhood may be realized as reducing accident rate and severity to be below a certain threshold; environmental sustainability may be materialized as a certain percentage reduction in emission. Given the limited processes and factors modeled in SmartGAP, you may not find corresponding metrics for all aspects of your planning goals; focus on the metrics available in SmartGAP corresponding to your goals for the remaining of this exercise.
3. Examine the factors in the Inputs tab and come up with two alternative scenarios that would move the 2035 metrics towards your planning objectives. Each of the scenarios can be a group of policies and strategies that involve one or more of the factors in the Inputs tab. Hopefully these two scenarios compose of policies from two different perspectives, for example, land use policies versus transportation investments.
4. Create the two scenarios in SmartGAP and run each of them. Analyze the outputs and metrics by comparing them with those from the base scenario and your objectives. According to how far off they are from your objectives, you may need to adjust your scenarios and run them again till the outputs are close to your objectives (or in case that your objectives turn out to be unrealistic/unreachable, revise your objectives.)

Report

In your report, describe your planning goals for Multnomah County and provide a brief background and/or justification for the goals. What do the goals entail in term of specific objectives and metrics for 2035?

Discuss your scenarios and simulation results. What policies and strategies each scenario packages and how do they translate into scenario inputs? Analyze and evaluate the outputs and metrics across the 3 scenarios and in comparison with your objectives. What are the "side effects" of the scenarios? Bearing in mind Levinsion and Krizek's 5E's evaluation framework, although it is not required to do comprehensive evaluations.

Finally, from your experience of this exercise, discuss the pros and cons of applying models like SmartGAP for land use-transportation planning.

The report should be concise and no more than 5 pages in length. Present results in tables & charts (not counting towards page limit). It is possible to export the SmartGAP data into csv files and create tables and charts in Excel or other software.

Instructions for SmartGAP

You can follow the steps below for working with SmartGAP. If you use a Mac, download and install xquartz from http://xquartz.macosforge.org/landing/ if you have not yet.

1. Download and install R. Download the latest version of R from CRAN: http://cran.r-project.org/. R is available for Linux, Mac OS X, and Windows; the current version is R-3.3.0. It can be installed like common applications on each OS. If needed, installation instructions for Windows are at https://cran.r-project.org/bin/windows/base/rw-FAQ.html#How-do-I-install-R-for-Windows_003f, while those for Mac OS X are at https://cran.r-project.org/bin/macosx/RMacOSX-FAQ.html.
2. Download SmartGAP.zip from the d2l course website. The version on d2l fixes some issue with R packages and should work on both Windows and Mac OS X. Unzip the downloaded zip file into a local folder.
3. If you use Windows, open a file explorer and find "RUN_SmartGAP.bat" in the unzipped SmartGAP folder, double click to run it. If you use a Mac, find "RUN_SmartGAP.command" in the unzipped SmartGAP folder in Finder and double click to run it. The first time that RUN_SmartGAP runs, it will set up R for running SmartGAP.
4. Close the window opened in Step 3 when prompted (".libPaths set successfully; close this window and run RUN_SmartGAP again.") and double click the appropriate file to run SmartGAP again. SmartGAP should now install R packages and launch its Graphic User Interface. In some case, you may need to repeat step 4.
5. Follow the SmartGAP User Guide (Chapter 4) for how to work with SmartGAP.

If you run into any problem with the SmartGAP program, post your problem on the Modeling Exercise Q&A forum on d2l discussion section