Activity #C07 - Cycle Length Evaluation and Selection

Purpose:
The purpose of this activity is to conduct an evaluation of a range of cycle lengths and determine the optimal cycle length for your system.

Tasks

Task 1: Assemble VISSIM network files	Start this activity with the network of optimal split times that you prepared in Activity #C06. Prepare a new folder with all of the previous files from Activity #C06. This will serve as the folder for your cycle length evaluation. You should create separate subfolders for each cycle length that you test.
Task 2: Run VISSIM for range of cycle lengths using average delay as MOE	Using average delay as your measure of effectiveness, conduct a set of VISSIM runs for a range of cycle lengths from 70 seconds to 100 seconds, in increments of 10 seconds. Each simulation should be 3600 seconds in length. Data should be collected for 3300 seconds, between 300 and 3600 seconds in the simulation. [Important note: You need to recompute your split times for each cycle length; if the resulting green time is less than the minimum green, set the green time for that phase equal to its minimum green, and recompute the split times for the remaining phases.]
Task 3: Select optimal cycle length based on average delay analysis	Compute the average delay for each intersection for each cycle length. Plot the average delay vs. cycle length for each intersection. Consider your results and identify your optimal cycle length. You may determine that one cycle length is best for one intersection but not for the other three. But you need to select an optimal cycle for the network, making a judgment about the tradeoffs of the best cycle for each intersection and for the system. Prepare a justification to support the reasons that you selected a particular cycle length value for the network, noting the differences in optimal values that might appear between the intersections. As you make your selection, remember to consider the goals that you have established for your signal timing plan. Note: You only need to consider the average delay for each intersection, not the delay for the individual movements or approaches.
Task 4: Verify capacity sufficiency	Using your critical movement analysis tool that you developed in Activity #C05, verify that you have sufficient capacity to accommodate the volume levels at the cycle length that you select. If not, adjust your cycle length and re-do the critical movement analysis.
Task 5: Prepare analysis summary and justification for cycle length selection	Prepare a summary of your analysis, including charts that support your analysis. The analysis should include the steps that you followed above with all supporting calculations. Please use a well-organized spreadsheet to present your data, results, and findings. Clearly identify the value of the cycle length for the system that you have selected as well as the justification for this selection.

Deliverable: Submit an Excel spreadsheet with clearly organized tables summarizing the data that you collected for each performance measure and the split times that you used for each cycle length case. The spreadsheet should also include a summary table showing the average values for each performance measure. Finally, you should answer the following questions:

1. What trade-offs did you have to make in selecting the cycle length?
2. Was there a large range of reasonably good cycle lengths?
3. Were comparisons with the base case significantly different or not; if so, for which parts of your system?
4. What visual observations of the network did you make?

Due: Class 42 (12.07)