Activity #C08 - Offset Evaluation and Selection

Purpose:
The purpose of this activity is to conduct an evaluation of a range of offsets and determine the optimal offset for each intersection in your system.

Tasks:

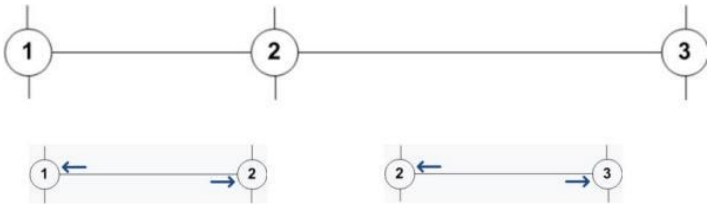
Task 1: Review time space diagram analysis	Review the results from your time space diagram analysis (Activity #C03) noting the offset ranges that worked best.
Task 2: Assemble VISSIM network files	Start this activity with the network from your optimal cycle length analysis that you prepared in Activities #C07. The offsets for each intersection should be set to zero. Create a new folder that includes all of the files for the offset analysis. Create new sub-folders for each offset value that you will test.
Task 3: Run VISSIM for range of offsets for each intersection pair; select optimal offsets	Use VISSIM to produce estimates for delay, number of stops, and travel times as a function of offset for the TH-movements served by the coordinated phases (the internal through movements in your network). • Start with an analysis of flow between intersections 1 and 2 in your network. Set the offset for intersections 1 and 2 to zero and run the simulation. Repeat for a range of offsets from 10 seconds to the value of your cycle length in 10 second increments for intersection 2. If your optimal cycle length is 60 seconds, for example, you will make runs for offsets of 0, 10, 20, 30, 40, and 50 seconds for intersection 2. • Use a 3600 second simulation time (recording data from 300 seconds to 3600 seconds). • Record the delay and number of stops for each of the two relevant (internal) major street through movements and the system travel time. • Plot the average delay vs. offset and number of stops vs. offset for each of the two internal through movements on the same chart, using both primary and secondary y-axes. • Select the offset for intersection 2 that provides the "best" operation, based on your MOEs of delay and number of stops for the WB movement at intersection 1 and the EB movement at intersection 2. Your decision should also reflect the goals that you have established for your system. • Continue with your offset analysis for intersections 2 and 3, using a zero offset for intersection 1 and the offset for intersection 2 that you selected above. Repeat your analysis of delay, number of stops, and travel time as described above for the EB movement at intersection 3 and the WB movement at intersection 2 using a range of offsets for intersection 3 from 0 to the cycle length. Select an offset for intersection 3 that provides the "best" operation. Again, your decision should also reflect the goals that you have established for your system. • Repeat your analysis, this time for intersections 3 and 4, changing the offsets for intersection 4 as above.
Task 4: Integrate results from time space diagrams and VISSIM	Using the values of cycle length and offsets that you selected from Activity #C07 and from your work above, re-do your analysis of offsets using the tools that you developed in Activities #C01 and #C03. Compare the results from this new analysis with your VISSIM results from task 3 above. Comment on this comparison including similarities and differences of the results from these two methods.

Task 5: Complete final VISSIM run and assemble performance data	Using your recommended values of cycle length, splits, and offset complete a VISSIM simulation to produce estimates of delay, number of stops, and travel time. Compare these results with your base case and note changes according to movement, intersection, and system, as appropriate.
Task 6: Prepare summary in Excel	Prepare an Excel spreadsheet with clearly organized tables summarizing the data that you collected for each performance measure, how you were able to include your previous work with the VISSIM results, comparison of these results with your base case, your analysis of the offset choices, and your final conclusions regarding the offset that you have selected.

Deliverable: You should turn in an Excel spreadsheet summarizing your work. The Excel spreadsheet should include your data, your plots of average delay vs. offset and number of stops vs. offset for each intersection, the offset you chose for each intersection, a brief justification of your selected offset, and answers to the following questions:

1. In making the final choice for the offset you will use for the each intersection, which movements or directions did you decide to focus on and why?
2. What trade-offs did you have to make in selecting the offset?
3. How did the offsets that you selected compare with the offsets that you identified using your time space diagram?
4. What policy options (priority movements) governed your offset selection?
5. Were comparisons with the base case significantly different or not; if so, for which parts of your system?
6. Based on your visual observations, how is the network performing when compared to the base case?

Important note:
Remember that one of your four intersections will serve as the zero offset reference point. And, the offset is defined for the other three intersections for a specific direction, using this reference point. The movements that are important in your analysis are only the ones that are affected by a change in the offset. For example, when comparing an offset difference between intersections 1 and 2, only the WB movement at intersection 1 and the EB movement at intersection 2 will be affected. Similarly, for an offset difference between intersections 2 and 3, the affected movements will be the WB movement at intersection 2 and the EB movement at intersection 3. So, if your reference intersection is 1, your strategy should be to consider the pair of intersections 1 and 2 and vary the offset at intersection 2 only.



Due: Class 42 (12.07)