Activity C09 - Design Elements

Purpose:
The purpose of this activity is to assemble the design elements that will form the basis for your final design presentation.

Tasks
Prepare a set of tabs in an Excel spreadsheet each of which address one component of your design elements. The tabs should include:

- Tab 1: base case results from VISSIM with travel time, delay, and stops data,
- Tab 2: split time results from critical movement analysis including capacity sufficiency for each intersection,
- Tab 3: split time analysis from VISSIM including travel time, delay, and stops,
- Tab 4: cycle length analysis from VISSIM including plots of intersection delay vs. cycle length,
- Tab 5: offset analysis from VISSIM including delay and stops vs. offset,
- Tab 6: time-space diagrams for your arterial showing the optimal offsets that you developed as part of AC03, and how these data inform your selection of the offsets for each intersection, and
- Tab 7: final plan analysis from VISSIM including travel time, delay, and stops.

Consider the following questions as you assemble information for the final presentation. Include brief (bullet point) answers for each of the questions on the relevant tabs in the same Excel spreadsheet.

For base case:

- What problems did you observe when you viewed the simulation; how do these observations relate to the evaluation data that you have generated?
- Which individual movements do you observe to encounter problems? Is the number of stops or the average delay for these movements considerably higher than the same measures for other movements? Is the delay higher than LOS E for any of the movements?
- No statements can be made about the travel time data as they will serve as the base comparisons with alternatives to be developed.

Optimized split times:

- What were the optimal split times for each intersection; how much did they change from the initial timings?
- Which movements improved significantly as compared to the base case?
- Did any of the problems that you identified in the base case analysis get better? Stay the same? Get worse?

Cycle length optimizations:

- What trade-offs did you have to make in selecting the cycle length?
- Was there a large range of reasonably good cycle lengths? Or not?
- Were comparisons with the base case significantly different or not? If so, for which parts of your system?
- How did the data from the platoon dispersion model, specifically the durations of the downstream platoons, affect the required green durations and thus the cycle length?

Offset optimizations:

- What trade-offs did you have to make in selecting the offset?
- How did the offsets that you selected compare with the offsets that you identified using your time space diagram?
- What objectives (priority movements) govern your offset selection? Which options did you consider before selecting a final one?
- Were comparisons with the base case significantly different or not? If so, for which parts of your system?
- How did the data from the time space diagrams affect your selection of the offset for each intersection?

Final plan:

- How did the performance of your final plan (travel time, delay, and stops) compare with the base case?
- Are your visualizations/observations of both the base case and your final plan consistent (or not) with the quantitative performance measures (travel time, delay, and stops)?
- What did you learn from your study of delay and stops at the three levels of aggregation (system, intersection, and movement)?