

Intersection Project, Part 2

Signal Timing Design

To completed by the same group and for the same intersection as Part 1.

# Signal Timing Plan

Using the data acquired in Part 1, each group will design an effective **fixed time signal plan** following the methodology discussed in class. The signal design process is summarized in the following steps:

1. Decide on a phasing plan. This may be simpler than the plan currently in use at the intersection.
2. Calculate the length of the intergreen period for each phase of your cycle.
3. Calculate the minimum green time for each phase based on the pedestrian crossing time.
4. Assume a saturation flow of 1800 veh/hr/ln.
5. Calculate the design flow for each approach or lane using the peak hour volume and peak hour factor.
6. Find the critical movements or lanes, and calculate the critical flow ratios.
7. Calculate the optimum cycle length using Webster’s equation.
8. Allocate the available green time using the critical flow ratios.
9. Calculate the capacity of the intersection approaches or lanes.
10. Check the capacities/design flow rates and green intervals/minimum green intervals. Adjust your cycle timing scheme if necessary.
11. Compute (using HCM2000 procedure) the average control delay per vehicle and Level of Service for each:

* Lane or lane grouping
* Entire intersection

The calculations required to complete each of the above steps will be included in the appendix of your project report. These calculations shall be neatly handwritten on engineering paper. Both group members are responsible for understanding all calculations.

In the body of the report you shall include the following diagrams: (see attached for samples)

* Intersection Phase Diagram (See Fig. 6.3 in Mannering text)
* Intersection Delay Summary Diagram (use baseplan of turning movement diagram from previous assignment)

# Project Report

The design performed in Part 2 will be part of a larger "Intersection Project" report that will be submitted later in the term. Remember this is a technical report, do not editorialize! No hand-writing nor hand-drawing will be accepted.

*The signal timing design calculations and the three summary diagrams listed above, together with a covering letter are due \_\_\_\_\_\_\_\_\_\_\_\_\_\_*