

## HIGHWAY SAFETY AND SIGNAL TIMING

Dear Consultant:

The Mythaca City Engineer is getting a lot of complaints about congestion at certain intersections. Some of the complaints may be exaggerated; some may be well-founded. To help the City Engineer diagnose the problem and propose solutions, good data are needed. Your small firm is being retained to collect and analyze data pertaining to some of the problem locations. The contract calls for 5-6 employees to undertake the tasks below. A link to the list of personnel is on the CE361 home page. Who collects the data is up to your firm, but all members of your firm will be held accountable for being able to explain the analyses to the City Engineer's staff.

Although the data collection includes observing traffic at peak periods, there is no reason to engage in dangerous activities. You should be able to make observations from sidewalks and cross from one side of a street to the other side in a safe, legal manner.

Each member of your group must sign the top page of the report you submit. By their signatures, the students certify that (a) they approve of what is being submitted, (b) they will accept the same grade that is awarded for the project, and (c) each student is responsible for having the project content available at a subsequent test.

1. (20 points) **Signal timing form.** Observe the traffic signal at Stadium and Northwestern. Complete a Traffic Signal Timing Form with the same format as FTE Table 8.4. Is the signal pre-timed or actuated? How did you decide this? If the signal is actuated, show the timing for one signal cycle or for an average of the cycles you observed, but make clear which it is.
2. **Time Space Diagram.** Collect signal timing data for either South or Columbia Street between 2<sup>nd</sup> and 9<sup>th</sup> Streets in downtown Lafayette.
  - A. (10 points) Summarize your data in the formats shown in FTE Tables 8.5, 8.6, and 8.7. Include the date of your observations.
  - B. (10 points) Create a TSD from your data.
  - C. (10 points) What range of speeds, if any, will enable a driver to travel along the street you chose without ever being stopped by a red light? Show the max and min green wave speed trajectories on your TSD and show your calculations clearly.
3. (25 points) **Traffic Signal Logic.** Observe the intersection of Northwestern Avenue and Cherry Lane and create a summary of the Traffic Signal Logic shown in the box on FTE page 446. Include the time(s) of your observations. Make your observations at a time when traffic is moderately heavy, not during a peak period or when traffic is very light.
4. (25 points) **Average Stopped Delay.** For each approach (all lanes combined) to the intersection of Stadium and Northwestern during the PM peak period, estimate average stopped delay using the method shown in FTE Figure 8.18. Ten minutes of observations should be sufficient. You are permitted to change the interval between observations of stopped vehicles. If you change the interval from  $I = 15$  seconds, explain why.