ACTIVITY
23 Inferring Signal Timing Parameter Values

FIELD

Purpose

The purpose of this activity is to test your understanding of traffic controller operations by inferring the value of the three standard signal timing parameters by observing traffic flow and signal displays in the field.

Learning Objective

- Infer signal timing parameter values through field observations

Deliverable

- Prepare completed charts with data as required for the following tasks, including inferred values of the signal timing parameters

Information

You will make field observations for one approach of the same intersection that you studied in Activity #15 (in Chapter 3) and for which you constructed a ring barrier diagram. You will record the detector status data and the signal display data for one approach of that intersection using forms shown in Table 10a and Table 10b. A major challenge of this activity is to infer the values of the timing parameters solely through observation of the vehicle arrival patterns and the signal displays on the approach that you are observing.

As you are collecting your data, look for traffic conditions that would allow you to observe the minimum green time, such as a queue of just one vehicle. Also, note that pedestrian calls may affect your timing observations, so it is best to not collect data when there is a pedestrian call.

Critical Thinking Questions

1. One complicating factor in the determination of your timing values is the interaction of your approach with the opposing approach. Describe how this interaction may affect the conclusions that you make about the timing values that have been set for your approach for the vehicle extension time.

2. Why is the maximum green time difficult to determine if the volumes on your approach are low?

3. What changes would you make in the way in which you made your observations and collected your data to improve the precision of your estimates?

TASK 1

Document the location of the detector or detectors on one approach of your intersection.

TASK 2

For a period of 15 minutes, record the following data for this approach:

- The times that each detector changes its state (from on to off, and from off to on) based on your knowledge of where the detection zone is placed on the approach
- The times that the signal display changes its state (when green starts, yellow starts, and red starts)

TASK 3

Prepare traffic control process diagram sketches (see Figure 95) for enough cycles for which you've collected data to show how you've inferred the signal timing data, noting the detector status as well as the signal display status data. Based on these sketches, estimate the values for the minimum green time, the passage time, the maximum green time, the yellow time, and the red clearance time.

Table 10a. Detector state data collection form

Time	Detector state (on/off)

Table 10b. Display state data collection form

Time	Display/color indication

Detector status		
Active phase		
Conflicting phase		
Timer status		
Minimum green		
Passage time		
Maximum green		
Display status	◯	
	◯	
	◯	

Time

Figure 95. Traffic control process diagram for field data observations