ACTIVITY 42 Determining the Effect of the Maximum Green Time on Intersection Operations

DISCOVERY

Purpose

The purpose of this activity is to help you to understand how the maximum green time settings affect intersection operations.

Learning Objective

- Describe the advantages and disadvantages of increasing maximum green time on intersection operations

Required Resources

- Movie files: A42-1.wmv A42-2.wmv

Deliverable

- Prepare a document with your answers to the Critical Thinking Questions and your observations from Tasks 1 and 2

Critical Thinking Questions

As you begin this experiment, consider the following questions. You will come back to these questions once you have completed the experiment.

1. Are all of the vehicles in the initial queue on the westbound approach served before the end of each green interval?

2. What is the mechanism for termination of the phase serving the westbound approach?

3. What are the advantages and disadvantages of the 40 second maximum green time for the operation of case 1?

4. What are the advantages and disadvantages of the 60 second maximum green time for the operation of case 2?

5. Which maximum green time setting would you select and why?

6. Identify the pros and cons of the two different maximum green time settings on the westbound approach and on the overall performance of the intersection. Consider what you observed and documented for both cases. Summarize the pros and cons of each case.

Information

In this activity, you will observe two cases, each focusing on the westbound approach of the major street, State Highway 8 (See Figure 149). In the first case, the maximum green time is set to 40 seconds. The demand is relatively high (1700 vehicles per hour across two lanes) on the westbound approach and the green time displayed is not sufficient to serve the demand. In the second case, the maximum green time is set at 60 seconds in an effort to serve more of the demand. But this change also has implications that must be considered for the operation of the intersection. Each case includes four cycles, focusing on the westbound approach. You will be asked to look at three things:

- What is the length of the queue at the beginning of each of the four green intervals on the westbound approach?
- How does the westbound phase terminate during each of the four cycles in each case?
- Are there vehicles from the westbound queue still unserved at the end of the green interval?

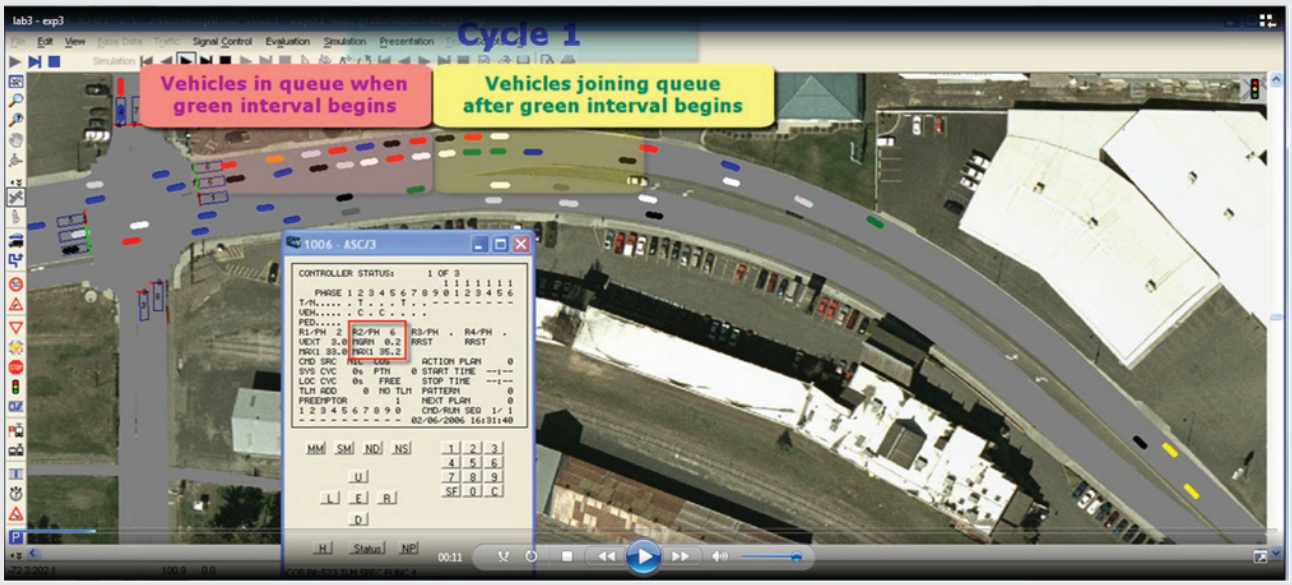

Figure 149. Activity 42 movie file

Task 1

Open the file: "A42-1.wmv." Observe the operation of case 1 and record your observations.

- Watch the entire video. It is nearly 3.5 minutes in length. Pay attention to the Critical Thinking Questions listed earlier.
- Record your observations

Task 2

Open the file: "A42-2.wmv." Observe the operation of case 2 and record your observations.

- Watch the entire video. It is nearly 4 minutes in length. Pay attention to the Critical Thinking Questions listed earlier.
- Record your observations

Student Notes: