

## **Activity #20: How A Traffic Phase Times and Terminates (Discovery)**

### **Purpose**

The purpose of this activity is to give you the opportunity to observe the timing of a traffic phase and the method by which the phase terminates.

### **Learning Objective**

- Describe the two primary methods for the termination of a traffic phase at an isolated intersection.

### **Required Resource**

- Movie file: A20.wmv.

### **Deliverable**

- Prepare a document that includes answers to each Critical Thinking Question based on your observations from this activity.

### **Critical Thinking Questions**

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

1. Why does the phase terminate for each of the two cases that you observe?
  
  2. What is the process followed by the Minimum Green timer from the beginning of the green indication, until the timer expires?
  
  3. What is the process followed by the Vehicle Extension timer from the beginning of the green indication, until the timer expires?
  
  4. What is the process followed by the Maximum Green timer from the beginning of the green indication, until the timer expires?
  
  5. What are the two conditions that separately cause the termination of the green indication?
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1. Reflect on what you have observed on how a phase terminates. Write a summary of your observations.

### **Information**

You will observe the southbound approach (phase 4) of the intersection of State Highway 8 and Line Street. This approach (Line Street) has two lanes, a left turn lane and a through/right turn lane. State Highway 8 is the major street and serves as a primary east-west route through the city. It also serves as the major access to a university. See Figure 1. You will monitor traffic on the through/right turn lane of this approach.



**Figure 1. Aerial photograph of State Highway 8 and Line Street**

In this activity, you will consider two cases, each illustrating a different method for the termination of phase 4 (which serves the SB through/right turn movements). You will observe how the phase times (the timing processes for the Minimum Green, Vehicle Extension, and Maximum Green timers), and how it terminates for each case. The two cases have been placed side-by-side in a movie format so that you can observe the traffic flow and timing processes at the same time. The simulation has been set to run at less than real time, slow enough so that you can observe all timing and traffic flow processes.

**Tasks:**

Task 1: Open the movie file: "A20.wmv." Pause for a moment when you've opened the movie file. Look at the screen and see what you can observe. Note that there are always four kinds of information:

- The traffic flow conditions.
- The status of the detectors (active or off).
- The status of the controller and the various timing processes.
- The status of the signal display (red, yellow, and green).

Make a list of the various items that you see in this screen. Why do we record the observations that you make? One of the most important skills that we want you to develop is to learn to observe and make judgments about how well (or not) traffic is flowing based on what you observe about the traffic flow, the detector status, the controller processes, and the signal display.

Task 2: Observe the status at the beginning of phase 4 green. Move the animation to  $t = 45.6$  seconds (which is equivalent to about 00:23 on the Windows Media Player clock). See Figure 2. Observe the following conditions for the scene on the left for the southbound approach.

- Two vehicles in queue, one of which is in the detection zone.
- The red indication showing for the southbound movement (which is about to end).
- The ASC/3 controller status screen showing that phase 4 is just about to begin timing ("T") and has an active call ("C") from the detector.
- The ASC/3 controller status screen showing that phase 4 is active in ring 1, that the Minimum Green timer is at 5.0 seconds, and that the Maximum Green timer is not active ("0.0").

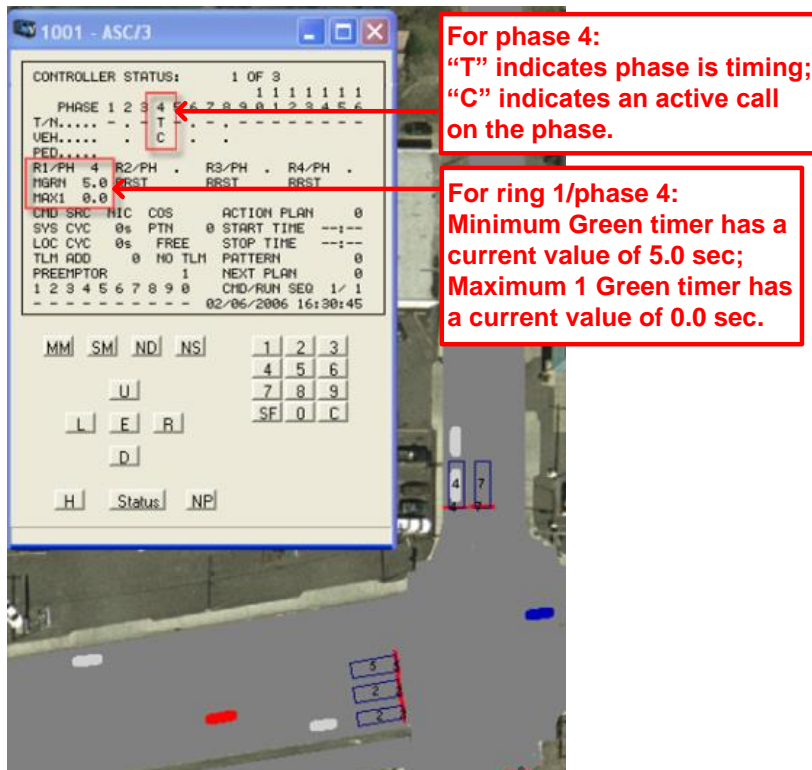


Figure 2 Traffic flow and controller status at t = 45.6

Note: There is a slight time delay between the ASC/3 controller and VISSIM, the simulation model. While the controller is now timing Minimum Green, the simulation will not be updated for a fraction of a second. As soon as you move forward from this instant in time, the simulation will show a green indication. These brief differences between what the controller is doing and what the simulation is displaying will only occasionally be noticeable (as when the simulation is paused).

Task 3: Observe the two cases for one green indication. [Note: Remember, the animation that you are about to observe plays at much slower than real time. This will allow you to monitor the traffic flow and the timing processes at the same time!]

- Start the Windows Media Player animation.
- First, watch the traffic flow, the detector status, and the timing processes for phase 4 for the case on the left. Monitor these conditions for the entire green indication.
- When this green indication is nearly complete for the case on the left, consider the reason for the phase terminating.
- Now turn your attention to the case on the right. The green indication is just beginning for this case. Again, monitor these conditions for the entire green indication.
- Note when the green indication ends for each of the two cases, and why.