



## PURPOSE

The purpose of this activity is to give you the opportunity to determine the vehicle change and clearance intervals for your design.

## LEARNING OBJECTIVES

- Determine the vehicle change and clearance intervals
- Describe how the variability of vehicle approach speeds affects the determination of the vehicle change and clearance intervals

## REQUIRED RESOURCE

- VISSIM input file from Activity #50

## DELIVERABLE

- Prepare a report using an Excel spreadsheet that includes your simulation data, your analysis, and your answers to the Critical Thinking Questions.

**Tab 1:** Title page with activity number and title, authors, and date completed

**Tab 2:** Data from FZP file

**Tab 3:** Parsed data for selected approach

**Tab 4:** Chart showing speed vs. distance upstream from the stop bar

**Tab 5:** Calculations for the yellow and red clearance times

**Tab 6:** Table of measures of effectiveness for each approach and for the intersection

**Tab 7:** Answers to Critical Thinking Questions

## CRITICAL THINKING QUESTIONS

1. What effect did the range in speeds that you observed for vehicles approaching the intersection have on the final result of the values of the yellow and red clearance times? Discuss your answer.



**TASK 2**

Start VISSIM and open your simulation file. Set the simulation resolution and speed:

- Select “Simulation,” then “Parameters”
- Set the “Simulation resolution” to 1 time step per second
- Set the “Simulation speed” to maximum speed
- Set the “Period” to 900 seconds

**TASK 3**

Select “Evaluation,” then “Files,” then “Vehicle record” to create the file to store the vehicle trajectory data.

- From “Configuration,” select vehicle number, simulation time, link number, “x” world coordinates (or “y” if your major street is oriented north-south), and speed (mph)
- From “Filter,” select 0 to 900 seconds
- These data will be written to the output file with the extension “fzp”

**TASK 4**

Complete the simulation run.

**TASK 5**

Open and parse the FZP file into tab 2 of an Excel worksheet. Copy the parsed data to tab 3 of your worksheet. In tab 3, keep only the data for the link that corresponds to the approach that you selected in Task 1.

**TASK 6**

Identify the relevant world coordinate location of the stop bar for your selected approach. Using the data from tab 5 (for your selected approach), prepare a plot of vehicle speed (y-axis) and the relevant world coordinate (x-axis) with the x-axis showing the range from the stop bar to 300 feet upstream of the stop bar. Visually identify those vehicles that continue through the intersection without stopping (noted by their relatively horizontal trajectory on your speed-distance plot). Based on this visual inspection, select an approach speed that you believe represents the 85<sup>th</sup> percentile of speeds for vehicles that continue through the intersection without stopping.

**TASK 7**

Compute the yellow and red clearance times based on the speed that you determined in Task 6, the average vehicle length, and the width of your intersection.

**TASK 8**

Using your final design values for yellow and red clearance times, run VISSIM to produce estimates of delay and queue length. Prepare a table of these measures of effectiveness for each approach and for the intersection.

