ACTIVITY
26 What Do You Know About Simulation Models?

ASSESSMENT

Purpose

The purpose of this activity is to provide you with the opportunity to learn more about the variety of traffic analysis tools that are available to the transportation engineer. A traffic analysis tool is a "software-based analytical procedure and/or methodology that supports different aspects of traffic and transportation analysis" (Alexiadis, Jeannotte, & Chandra, 2004).

Learning Objectives

- Describe the categories of traffic analysis tools that are commonly used by the transportation engineer
- Describe the application of a simulation model

Deliverable

- Prepare a document with your answers to the Critical Thinking Questions

Required Resources

- *Traffic Analysis Toolbox, Volume 1: Traffic Analysis Tools Primer*
- *Traffic Analysis Toolbox, Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software*

Task 1

Read pages 1-18 from the *Traffic Analysis Toolbox, Volume 1: Traffic Analysis Tools Primer* (Alexiadis, Jeannotte, & Chandra, 2004) and pages 35 to 43 from *Traffic Analysis Toolbox, Volume III: Guidelines for Applying Traffic Microsimulation Modeling Software* (Dowling, Skabardonis, & Alexiadism 2004). Prepare answers to the Critical Thinking Questions.

Critical Thinking Questions

When you have completed the reading, prepare answers to the following questions.

1. What are the categories of traffic analysis tools and what are the basic attributes of each category?

2. What is a microsimulation model?

3. Under what conditions would you use a microsimulation model?

4. What are the strengths and limitations of the Highway Capacity Manual methodologies?

5. What are the strengths and limitations of simulation?

6. What are the differences in how the Highway Capacity Manual and simulation models report performance measures?

7. What is a link/node diagram and what do links and nodes represent?

8. What kinds of driver behavior are modeled in a microsimulation model?

9. What are some of the new features available in the current version of VISSIM?

10. What kind of model would you use to determine the number of lanes needed at a signalized intersection to meet a desired level of service?

11. If a time-scan model is based on scanning time on a regular basis, what is an event scan model based on? For a signalized intersection, list some events of interest that would be the basis for an event scan model.

12. For what kinds of problems or system conditions would you consider using the following models: Critical Movement Analysis, Highway Capacity Manual, and VISSIM?

13. Which model would you use to test signal timing strategies for a congested arterial with three closely spaced signals? Why?