## CHAPTER 7 INTERPRETING HCM AND ALTERNATIVE TOOL RESULTS

## CONTENTS

1. INTRODUCTION	7-1
Overview	7-1
Chapter Organization	7-1
Related HCM Content	7-2
2. UNCERTAINTY AND VARIABILITY	7-3
Uncertainty and Variability Concepts	7-3
Sources of Uncertainty	7-4
Sensitivity Analysis	7-5
Accuracy and Precision	7-8
Average Values	7-9
3. DEFINING AND COMPUTING UNIFORM PERFORMANCE	
MEASURES	7-10
Performance Measures Reported by HCM Methodologies	7-10
Use of Vehicle Trajectory Analysis in Comparing Performance Measures	7-15
Requirements for Computing Performance Measures by Vehicle Trajectory Analysis	7-19
Stochastic Aspects of Simulation Analysis	7-28
Comparing HCM Analysis Results with Alternative Tools	7-31
4. REFERENCES	7-39

## LIST OF EXHIBITS

Exhibit 7-1 Example Sensitivity Analysis for Selected Basic Freeway Segment Model Inputs	7-6
Exhibit 7-2 Example Sensitivity Analysis of Urban Street Link Pedestrian LOS Score	7-7
Exhibit 7-3 Example Sensitivity Analysis of All-Way STOP-Control Model Outputs Based on Varying Volume Inputs	7-8
Exhibit 7-4 Key Performance Measures Reported by HCM Methodologies	7-10
Exhibit 7-5 Mathematical Properties of Vehicle Trajectories	7-16
Exhibit 7-6 Trajectory Plot for Uniform Arrivals and Departures	7-18
Exhibit 7-7 Queue Backup from a Downstream Signal	7-18
Exhibit 7-8 Definition of Delay Terms in Time and Space	7-24
Exhibit 7-9 Effect of Demand Volume on Variability of Simulated Delay on an Approach to a Signalized Intersection	7-30
Exhibit 7-10 Variability of Overall Performance Measures for a Large Urban Network	7-30
Exhibit 7-11 Application Framework for Alternative Tools	7-33
Exhibit 7-12 Oversaturated Delay Representation by the HCM and Simulation Modeling	7-36
Exhibit 7-13 Comparison of HCM and Simulation Delay Definitions for Four Oversaturated Periods	7-38