CHAPTER 26 FREEWAY AND HIGHWAY SEGMENTS: SUPPLEMENTAL

CONTENTS

1. INTRODUCTION	26-1
2. STATE-SPECIFIC HEAVY-VEHICLE DEFAULT VALUES	26-2
3. TRUCK ANALYSIS USING THE MIXED-FLOW MODEL	26-4
Introduction	26-4
Overview of the Methodology	26-4
4. ADJUSTMENTS FOR DRIVER POPULATION EFFECTS	26-14
5. GUIDANCE FOR FREEWAY CAPACITY ESTIMATION	26-15
Freeway Capacity Definitions	26-15
Capacity Measurement Locations	
Capacity Estimation from Field Data	26-18
6. FREEWAY AND MULTILANE HIGHWAY EXAMPLE PROBLEMS	26-22
Example Problem 1: Four-Lane Freeway LOS	26-22
Example Problem 2: Number of Lanes Required for Target LOS	26-25
Example Problem 3: Six-Lane Freeway LOS and Capacity	26-27
Example Problem 4: LOS on a Five-Lane Highway with a Two-Way Left-Turn Lane	26.20
Example Problem 5: Mixed-Flow Freeway Operations	
Example Problem 6: Severe Weather Effects on a Basic Freeway	20-52
Segment	26-39
Example Problem 7: Basic Managed Lane Segment	
7. TWO-LANE HIGHWAY EXAMPLE PROBLEMS	26-46
Example Problem 1: Class I Highway LOS	26-46
Example Problem 2: Class II Highway LOS	
Example Problem 3: Class III Highway LOS	
Example Problem 4: LOS for a Class I Highway with a Passing Lane	26-55
Example Problem 5: Two-Lane Highway Bicycle LOS	26-57
8. REFERENCES	26-59
APPENDIX A: TRUCK PERFORMANCE CURVES	26-60

APPENDIX B: WORK ZONES ON TWO-LANE HIGHWAYS	26-65
Concepts	26-65
Work Zone Capacity	26-66
Queuing and Delay Analysis	26-69
Example Calculation	26-71
References	26-75



LIST OF EXHIBITS

Exhibit 26-1 State-Specific Default Values for Percentage of Heavy Vehicles on Freeways
Exhibit 26-2 State-Specific Default Values for Percentage of Heavy Vehicles on Multilane and Two-Lane Highways26-3
Exhibit 26-3 Overview of Operational Analysis Methodology for Mixed-Flow Model
Exhibit 26-4 Speed–Flow Models for 70-mi/h Auto-Only Flow and a Representative Mixed Flow
Exhibit 26-5 SUT Travel Time Versus Distance Curves for 70-mi/h FFS26-9
Exhibit 26-6 TT Travel Time Versus Distance Curves for 70-mi/h FFS26-9
Exhibit 26-7 δ Values for SUTs
Exhibit 26-8 δ Values for TTs26-10
Exhibit 26-9 Recommended CAF and SAF Adjustments for Driver Population Impacts
Exhibit 26-10 Recommended Capacity Measurement Location for Merge Bottlenecks
Exhibit 26-11 Recommended Capacity Measurement Location for Diverge Bottlenecks
Exhibit 26-12 Recommended Capacity Measurement Location for Weaving Bottlenecks
Exhibit 26-13 Illustrative Example of the Capacity Estimation Procedure 26-20
Exhibit 26-14 Capacity Estimation Using the 15% Acceptable Breakdown Rate Method
Exhibit 26-15 List of Freeway and Multilane Highway Example Problems 26-22
Exhibit 26-16 Example Problem 1: Graphical Solution
Exhibit 26-17 List of Two-Lane Highway Example Problems
Exhibit 26-18 Example Problem 1: Interpolation for ATS Adjustment Factor
Exhibit 26-19 Example Problem 1: Interpolation for Exponents <i>a</i> and <i>b</i> for Equation 15-10
Exhibit 26-20 Example Problem 1: Interpolation for $f_{np,PTSF}$ for Equation 15-9
Exhibit 26-21 Example Problem 4: Region Lengths
Exhibit 26-A1 SUT Travel Time Versus Distance Curves for 50-mi/h FFS 26-60
Exhibit 26-A2 SUT Travel Time Versus Distance Curves for 55-mi/h FFS 26-60
Exhibit 26-A3 SUT Travel Time Versus Distance Curves for 60-mi/h FFS 26-61
Exhibit 26-A4 SUT Travel Time Versus Distance Curves for 65-mi/h FFS 26-61
Exhibit 26-A5 SUT Travel Time Versus Distance Curves for 75-mi/h FFS 26-62

Exhibit 26-A6 TT Travel Time Versus Distance Curves for 50-mi/h FFS	26-62
Exhibit 26-A7 TT Travel Time Versus Distance Curves for 55-mi/h FFS	26-63
Exhibit 26-A8 TT Travel Time Versus Distance Curves for 60-mi/h FFS	26-63
Exhibit 26-A9 TT Travel Time Versus Distance Curves for 65-mi/h FFS	26-64
Exhibit 26-A10 TT Travel Time Versus Distance Curves for 75-mi/h FFS	26-64
Exhibit 26-B1 Traffic Control for a Two-Lane Highway Work Zone Involving a Lane Closure	26-66
Exhibit 26-B2 Directional Queueing Diagram for a Two-Lane Highway Lane-Closure Work Zone	26-70
Exhibit 26-B3 Example Calculation: Work Zone Roadway Parameters	26-71
Exhibit 26-B4 Example Calculation: Work Zone Traffic Parameters	26-71

