Corrections to first printing of
FUNDAMENTALS OF TRANSPORTATION ENGINEERING
by Jon D. Fricker and Robert K. Whitford
Updated 4 December 2005

We tried to produce a textbook that is accurate and free from errors – we really did try! However, we (and other early users of the book) have found items that should be corrected or improved. We thank those who have helped us find them. All the changes – major and minor – are listed below and have been brought to the publisher’s attention. We apologize for these errors and hope that they do not cause the reader too much inconvenience. If you find any other contents that are unclear or appear to be in error, please contact Prof. Fricker at fricker@purdue.edu. On 7 June 2005, Prentice Hall told us that a reprint of the first edition is under way. May it be error-free!

<table>
<thead>
<tr>
<th>Page</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>In the 2nd last sentence in FYI, “Figure 1.2” should be “Figure 1.3”.</td>
</tr>
<tr>
<td>6</td>
<td>Near end of fourth full paragraph, “coald” should be “could”.</td>
</tr>
<tr>
<td>8</td>
<td>The last word in the caption to Figure 1.5 should be “Wisconsin”.</td>
</tr>
<tr>
<td>14</td>
<td>Example 1.2 Part C should begin “At what value …”.</td>
</tr>
<tr>
<td>17</td>
<td>Figure 1.10. 2nd level. “Airplane” should be “Air” because we are talking about the “way.” Also, non-motorized modes do not belong in the 2nd level. Non-motorized transportation modes, such as walking and biking, are “modes” whose “ways” are highways (or streets) or sidewalks (or paths) that parallel them.</td>
</tr>
<tr>
<td>30</td>
<td>In Table 1.6. Column 10 Lane Miles. For 1990, it is 49.2 miles instead of 42 miles (12.3 miles x 4 lanes = 49.2 miles)</td>
</tr>
<tr>
<td>30</td>
<td>Trend discussion 2. “The freeway expansion…by about 29 percent.” It should be 31 percent: (64.6-49.2)/49.2 x 100 = 31.3%. 64.6 miles = 12.3 miles x 4 lanes + 7.7 lanes x 2 lanes (widening).</td>
</tr>
<tr>
<td>31</td>
<td>In the paragraph right above SUMMARY. “…derived from the Table 1.5…” should be “…derived from Table 1.6…”</td>
</tr>
<tr>
<td>32</td>
<td>In the Glossary, insert the terms “Primary data: Data collected directly by the analyst.” and “Secondary data: Data borrowed from other places or from previous activities in the same place.”</td>
</tr>
<tr>
<td>34</td>
<td>After the first sentence in Part B of Exercise 1.1, insert the following sentence: “The state environmental agency has threatened to impose stiff fines on any major employer for which the average occupancy of vehicles entering its parking lots is less than 2.0.”</td>
</tr>
<tr>
<td>34</td>
<td>Reorganize Exercise 1.4 so that Part A starts with “For example” and Part B starts with “What would be the flaws …”. Also, reword the second sentence to replace “During the next week, be aware of experiments” with “List an experiment” and make it Part C of the exercise.</td>
</tr>
</tbody>
</table>

CHAPTER 2 TRAFFIC FLOW: THEORY AND ANALYSIS

<table>
<thead>
<tr>
<th>Page</th>
<th>Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>In 6th line, “1044/4350= 21.85 percent” should be “1044/4777 = 21.85 percent”.</td>
</tr>
<tr>
<td>54</td>
<td>In Table 2.5, speed of Vehicle 7 should be 66.06 kph.</td>
</tr>
<tr>
<td>54</td>
<td>The last SMS calculation of the page, with u(7) = 66.06 kph, is 8/0.1227 = 65.19 kph.</td>
</tr>
<tr>
<td>55</td>
<td>Delete the first two lines of text under Figure 2.13.</td>
</tr>
<tr>
<td>56</td>
<td>In 4th line of Solution to Example 2.7, replace “on row X” with “just below row X”. On the last line of the Solution, replace “row 112” with “row 113”.</td>
</tr>
<tr>
<td>59</td>
<td>In the solution to Part A of Example 2.8, replace the phrase “S = 5.3 value in Table 2.7 for rural two-lane roads” with “S = 5.3 default value”.</td>
</tr>
<tr>
<td>60</td>
<td>In Equation 2.5, “K” should be “z”.</td>
</tr>
<tr>
<td>61</td>
<td>In the solution to Exercise 2.9, the first D formula should look like this: D = (13 veh/(468.77 mi - 468.50 mi))/3 lanes = (13 veh/0.27 mi)/3 lanes</td>
</tr>
<tr>
<td>68</td>
<td>The last units in Example 2.11 should be “vph”, not “vpmpl”.</td>
</tr>
<tr>
<td>70</td>
<td>In paragraph 2, line 10, “point upper point”. Two lines later, (12 mph) → (13 mph).</td>
</tr>
<tr>
<td>73</td>
<td>In the first line of the Solution to Exercise 2.14A, “free-flow speed was been estimated” Delete “(also “q” or “V”).”</td>
</tr>
<tr>
<td>83</td>
<td>In the caption for Table 2.12, “0.8333” should be “0.08333” veh/sec.</td>
</tr>
<tr>
<td>85</td>
<td>In the Solution to Exercise 2.18, “interval” should be “interval”.</td>
</tr>
<tr>
<td>88</td>
<td>In the Solution to Exercise 2.21, “overed” should be “covered”.</td>
</tr>
</tbody>
</table>
| 93   | In Figure 2.30, “Four or Less Axle Single Trailers” should be “Trailers with Four or Fewer Axles” and “Five..."
Errata, Fundamentals of Transportation Engineering  Page 2 of 7

or Less Axle Multi-Trailers” should be “Multi-Trailers with Five or Fewer Axles”.

In the Think About It box, add the words “of Table 2.17” after “column 2” and add the words “in Step 3” after “given”.

The definition of 85th percentile speed should begin “The speed that is not exceeded…”

In Exercise 2.2, delete the third sentence. In the second sentence, change “average” to “mean”.

In Exercise 2.3, “Which” should be “which”.

In Exercise 2.10(c), “wheel sets (axles) per vehicle” should be “wheel sets (axles) per vehicle”.

Exercise 2.23, 2nd sentence, “t(P) = 294.7 seconds.” should read “Σ t(P) = 294.7 seconds.”

In Problems 2.31 and 2.32, replace u with S and k with D.

In Exercise 2.34, add a second sentence: “In the table, ‘V/C’ represents the ratio of flow rate to capacity.”

In Exercise 2.37, “Figure 2.20” should be “Figure 2.21”.

In Exercise 2.41, replace u with S and k with D.

The title of Exercise 2.47 should be “Poisson Events at a Driveway”.

Exercise 2.50, 2nd line, “1200 vehicles in the lane…” should read “1200 vehicles per hour in the lane…”

CHAPTER 3  HIGHWAY DESIGN FOR PERFORMANCE

In Line 3 of Section 3.1.1, change “prominent” to “prevalent”.

In the Note in Table 3.2, “LOSF” should be “LOS F”.

Begin the third line of text with the word “a” before “Grade Adjustment Factor (fG)”.

In Table 3.7, E1 for Flow Rates > 1200 should be 1.1, not 1.0.

1st paragraph, 2nd sentence, “Tables 3.13 to 3.20 show…” should read “Tables 3.15 to 3.18 show…”

In the “Table used:” line of Table 3.19, change the table numbers from 3.18 through 3.21 to 3.15 to 3.18.

1st line, “FFS = FFSi - fLW -…” should be “FFS = BFFS - fLW -…”

In Example 3.4 Part B3 solution, the Et value for level terrain taken from Table 3.14 should have been 1.5, not 2.5. This makes fHV = 1/1.07 = 0.935 and V = 832 pcpmpl. The LOS is still “B” and the density D = 832 pcpmpl/65 mph = 12.8 pc/mi/ln in calculation B4.

Also in Step B3, right below the fHV calculation, “vp = V/(PHF)(N)(fHV)(fHV) =…” should be “vp = V/[(PHF)(N)(fHV)(fHV)] =…”

Example 3.4 Part B5 solution should begin “In Table 3.13,…”

Inside the Think About It box, “Table 3.7.” should be “Table 3.12.”

Figure 3.12. In the Speed Inputs section, BFFS should be 70 mi/h and FFS should be 64.5 mi/h. In the LOS and Performance Measures section, S should be 66.0 mi/h and D should be 22.7 pc/mi/ln.

In Table 3.20, “FFS mph” should be “Speed mph”.

The Think About It box should read “Some of the factors that determine freeway capacity can change from day to day’. Which factors are they? What about hour-to-hour changes? What will this mean for planning?”

In the Think About It box, the second sentence should start “Do you have any examples that don’t seem to fit …”

In Part C solution, “DC1” should be “DC2” all four times it appears.

The comments for t bar in the righthand column of Table 3.22 should be “D model estimates less total time for λ>0.

In Example 3.10E, “Equation 2.23” should be “Equation 2.24”.

In Problem 3.2(a), “PTSF-based” should be “ATS-based”.

As a new fourth sentence in Exercise 3.7, add “Doby has 20 access points along its one-mile section of SR361”.

In Exercise 3.13, replace “four-lane freeway (two lanes in each direction)” with “six-lane freeway (three lanes in each direction)” and “rolling terrain” with “level terrain”.

In Exercise 3.15, the question should be “Why do you think the speed was posted as 60 mph, not 65 mph?”

In Exercise 3.23, “Example 3.12E” should be “Example 3.10E”.

CHAPTER 4  MODELING TRANSPORTATION DEMAND AND SUPPLY

In line 3, “33,500” should be “33,300”.

Solution C should begin “Of the 209,871 person trips…”

In the lines below the T21 calculation in Example 4.5, “(produced in zone 1)” should be “(produced in zone 2)” and “Econoly (zone 2)” should be “Econoly (zone 1)”.

In Table 4.9, Column 3, t(1j) should be t(2j)

The sentence immediately before Example 4.6 should read “Shorter trips between cities are more likely to be made by auto than longer intercity trips.”
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214 In the Example 4.10 Solution, 4th line from the bottom, “Equation 4.6” should be “Equation 4.7”.
219 In the $P(bus)$ calculation for Part B, “0.0134” should be “0.0191”.
220 The vertical axis in Figure 4.15 should be “$P(A)$”.
222 The sentence just above the Think About It box should end with a period.
223 Just above Table 4.13, “each mode $m$” should be “each mode $m$”.
226 Example 4.15, third line: $U(m)$ should be $V(m)$.
233 In Figure 4.21, all the labels on the horizontal axis should be divided by 10. “5” should be “0.5”, etc.
234 In Example 4.18, “6.0” in the third line should be “5.8”.
235 The first paragraph in Section 5.2.5 would be clearer if it ended “(A|P) is calculated as follows:” instead of “(A|P) =”.
236 In the numerator of the [A|P] equation, there should be an “i” before the “(1+i)^n”.
237 In line 4 of section 5.2.3, “$450” should be “$400”.
238 In line 3 of Example 5.2, “$680,000” should be “$860,000”.
239 The right bracket in the calculation for “Project A 5%” should be moved to the right of “$100,000”.
240 In the Railbed computations in Example 5.8, both cases of “$80,000” should be “$180,000” and $EUAC_{Railbed} = $30,900, not $31,532. This changes two entries in the EUAC column of the table for Example 5.8: 31,532 $\rightarrow$ 30,900 and 124,483 $\rightarrow$ 123,851
241 In the Think About It box, change “Example 5.16” to “Example 5.17”.
242 In first line below Figure 5.12, change “range” to “Range”.
243 In Exercise 5.5, change “This questions” to “This exercise”.
244 In Exercise 5.12(d), remove the word “above”.

CHAPTER 5 PLANNING AND EVALUATION FOR DECISION-MAKING
260 Delete the last sentence before subsection 5.2.1. The sentence starts “Several texts …”
261 In line 4 of section 5.2.3, “$450” should be “$400”.
262 In line 3 of Example 5.2, “$680,000” should be “$860,000”.
263 The first paragraph in Section 5.2.5 would be clearer if it ended “(A|P) is calculated as follows:” instead of “(A|P) =”.
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269 In the Think About It box, change “Example 5.16” to “Example 5.17”.
270 In first line below Figure 5.12, change “range” to “Range”.
271 In Exercise 5.5, change “This questions” to “This exercise”.
272 In Exercise 5.12(d), remove the word “above”.

CHAPTER 6 SAFETY ON THE HIGHWAY
290 Figure 6.2 shows how much highway safety has improved, both in terms of exposure (fatalities per vehicle mile travel) and fatalities per registered car, since the formation of NHTSA.
291 Delete first paragraph.
292 In the last line before Example 6.3, “The Z value … is 1.96.” should be “The Z value … is 1.645.”
293 In the 5th line above the black solid line in the middle of page 334, delete “word per life”.
294 The equation for aerodynamic force should be: $Raero = 0.5 \rho CDAV^2$, where $A$ is the frontal area of the moving shape.
295 The first line should read “The time needed to go from $v_o$ to $v_f$, given a braking distance $D_{br}$, is”
296 In Equation 6.15, change “t” to “T”.
297 After Equation 6.15, between the definition of $g$ and a new paragraph that begins “If braking…”, insert

\[ t = \frac{v_o - v_f}{a} = \frac{v_o - v_f}{f* g} \]

298 In Equation 6.16, replace “+” between $f$ and $G$ with “-”.
299 In the Variable $f$ column, replace 7.89 with 8.12 and 367 with 380. Three lines below the table, replace 367 with 380.
300 In the caption for Figure 6.31, change “Evergreen” to “Dodge”.
301 In Exercise 6.3 to “Crash Rates”.
302 In Exercise 6.4(b), insert the words “the intersection of” after the word “whether”. Also, $Z = 1.96$ should be $Z = 1.645$.
303 Change the title of Exercise 6.16 should be Example 6.15.
304 Table 6.12. In the Variable $f$ column, replace 7.89 with 8.12 and 367 with 380. Three lines below the table, replace 367 with 380.
305 Just above (Note: …). Example 6.16 should be Example 6.15.
306 In the caption for Figure 6.31, change “Evergreen” to “Dodge”.
307 In Exercise 6.22 to “Traffic Crash Evidence”.
308 In Exercise 6.24, change the word “Circle” to “Cite”.
309 In Exercise 6.25, the line $A$ should be a double solid centerline.

CHAPTER 7 HIGHWAY DESIGN FOR SAFETY
311 In the Think About It box, change “Equation 7.3” to “Equation 7.5”.
312 In Table 7.1, Column 2, “from PVC” $\rightarrow$ “from VPC”
313 In the Solution to Example 7.5, the units for $\frac{1}{2} \Delta$ are degrees.
314 In the solution to Example 7.9, “550” should be “495”. This makes $\tan \beta = (2 + 8.6403 -1)/495 = 0.01948$ and $\beta = 1.116$ degrees.
392 1st line, 2nd sentence. “The maximum rate of curvature…” should read “The minimum rate of curvature…”
393 7th line from the bottom. “maximum values of Kc…” should read “minimum values of Kc…”
394 1st sentence in the Solution to Example 7.11. “… the K values for the maximum length of curve for SSD…” should read “… the K values for the minimum length of curve for SSD…”
394 The value of Gm in the Solution to Example 7.11 should be 0.0327, not 0.037.
395 In the 3rd line of text from the bottom and in the equations at the bottom of the page, “ΔSSD” should be “ΔS”, to be consistent with the notation in Figure 7.17.
395 In Equation 7.19, ∆ should be ∆S.
396 In Equation 7.20, M SSD should be Ms.
396 In the Solution to Example 7.12, “R vehicle” should be “Rv” and “MSSD” should be “Ms”.
398 The label for the horizontal axis in Figure 7.20 should be “Average speed of passing vehicle (mph)”. Also, remove “Elements-” from the label for the vertical axis.
398 In the Solution to Example 7.13, “Figure 7.18”Æ “Figure 7.19” and “table above it”Æ “text above it”.
399 The Think About It box should read “Why do you think the 10 mph passing difference leads to a lower PSD than the solution for Example 7.13?”
403 In Figure 7.22, label the rightmost point as “0.10”.
407 Section 7.3.4, 1st sentence. “The change from a superelevated roadway … normal tangent roadway is called superelevation runoff.” should read “The change from a superelevated roadway … normal tangent roadway is called transition section consisting of superelevation runoff and tangent runoff.”
407 Section 7.3.4, beginning of the 2nd paragraph. “Like the superelevation runoff, the spiral has about one third of the length…” should read “The superelevation runoff has about one third of the length…”
407 Section 7.3.4, last sentence of the 2nd paragraph. Remove this sentence.
408 In the first line, change “A table” to “Exhibit 3-29”.
410 In the bottom diagram of Figure 7.28, the inside edge begins to drop at Point B.
411 Add to the Glossary: “Offset: The distance between the curve and the tangent extended.”
412 In Exercise 7.2, change “describes” to “describe”.
412 Table below Exercise 7.2 should be placed between the first and second lines of Exercise 7.3. Also change “PVI” to “VPI” and “PVC” to “VPC”.
412 In Exercise 7.4, change “an intersection angle” to “a central angle”. Also reverse the order of parts (c) and (d).
413 In Exercise 7.5, change “an external angle” to “a central angle ∆”.
413 In Exercises 7.9, 7.10, and 7.12, change “PVI” to “VPI”, “PVT” to “VPT”, and “PVC” to “VPC”.
413 In Exercise 7.9, change “PC” to “VPC”.
413 In Exercise 7.10(e), change “What speed?..” To “At what speed?”
414 Exercises 7.13 and 7.15 should be moved down the page to the Section labeled “Banking the Curves and Runoff”. If Exercise 7.13 is not moved, assume that 1650 feet is the radius of the curve.
414 Replace the second sentence of Exercise 7.16 with “The road on the east (righthand) side of the river is level at an elevation of 318 feet. The road on the west (lefthand) side of the river has a constant grade of plus 1.5 percent. The curve from the west will begin at an elevation of 328 feet.
414 In Exercise 7.18, change “curves VPC” to “curves’ VPC” and “percent Adequate” to “percent. Adequate”.
414 In Exercise 7.22, change “a 600-foot curve” to “a curve with radius 600 feet to the centerline”.
414 In Exercise 7.23, add “(straight-line distance)” after “361 feet apart”.

CHAPTER 8 DESIGN OF INTERSECTIONS FOR SAFETY AND EFFICIENCY
2nd paragraph, 2nd line. “11 possible conditions” should read “8 possible conditions”.
429 In Example 8.3, replace the city that a traffic signal be installed with “ask the city to install a traffic signal”.
432 In Figure 8.10, change “Xe” to “Xe,” and add arrows to show the range of Xe and Xs as follows:
All arrows begin at the left edge of the intersection. In each of the three diagrams, the “cannot stop” bar is above the street approach and the “must stop” bar is below the street approach. In all three diagrams, the Xs arrow ends at the right end of the “must stop” bar and the Xe arrow ends at the left end of the “cannot stop” bar.
433 In paragraph 2 of the Solution to Example 8.4, “th.e”Æ “the”. Also change “…he must be able to … 239.93 feet.” to “he would have to use an uncomfortably higher deceleration rate or have a shorter perception-reaction time than is assumed in design. Now calculate the distance he must travel, Xs, to completely clear the intersection within the yellow interval of 4.0 seconds.”
In the Solution to Example 8.4, replace the first line of the last paragraph with:

Hence, the maximum distance from the stop line within which he can safely clear the intersection is

\[ X_c = X_y - (W + L) = 176.40 - (60 + 16) = 100.40 \text{ ft} \]

Because \( X_s > X_c \), a dilemma zone exists. Its length is \( X_s - X_c = 163.39 - 100.40 = 62.99 \text{ ft} \).

In Exercise 8.4(a) should read “Show clearly your calculations of a’, b’, c’, and d’.”

In Problem 8.7, there is no Part (e). The question that appears as Part (e) should be included with Part (d).

In Problem 8.19, change “too many cycle times are used” to “too many signal cycles are needed”. Below the bullet list, change “30-second street light timing” to “30-second green phases” and “is set by” to “are based on”. In Part (c), change “lights” to “signals” and “Adjusting your offset” to “Adjust the offsets”.

In Problem 8.19(c), change “achieve flow” to “achieve green wave flow” and “lights” to “signals”. Part (d) should read “What speed will your final solution permit you to achieve in each direction?”

CHAPTER 9 HIGHWAY DESIGN FOR RIDEABILITY (PAVEMENT DESIGN)

The soil should extend up to the bottom of the Asphalt Pavement Structure. There should be no gap.

In Exercise 9.10, Step 1, units for \( k \) should be lb/in\(^3\).

The last sentence of the first paragraph should be “The formulas are given in Equations 9.10 and 9.11.”

Example 9.2. 2\(^{nd}\) sentence after the ESALs calculations. “ESAL of 1.43” should be “ESAL of 1.44”. This changes Table 9.5 as follows. For Full semi, the entries should be 60, 2.44, 146.4, and 36,600. For Full dump truck, the entries should be 60, 1.48, 88.8, and 22,200. In the Total row, the entries should be 240, (blank), 259.2, and 64,800. In the last sentence of the Solution, “64,350 * 10.95 = 705,000” becomes “64,800 * 10.95 = 709,560”.

In Exercise 9.13, the sentence that begins “Use SN(1) = 2.8” should be part of Part (b). Part (c) should begin with “An easy-to-follow search” and Part (d) should begin with “Which of your layer designs”. There is no Part (e) in Exercise 9.13.

Exercise 9.14 should start “Using the ESAL from the design lane on SR535 in Exercise 9.6,”. The exercise should end with a question mark.

In Exercise 9.17, change “tested very dense at 146 pounds” to “was found to have density \( \omega = 146 \text{ pounds} \)”.

Also delete the last sentence.

CHAPTER 10 PUBLIC MASS TRANSPORTATION

Change “dock” to “deck” in Figure 10.4(a) caption.

In Exercise 10.1, change “buswayd” to “busway”.

In Exercise 10.2, change the URL to http://www.fta.dot.gov and add a new sentence: “Click on ‘Research and Technical Assistance’, then ‘Technology’, then ‘Bus Rapid Transit’.”

To Exercises 10.5 and 10.6, add the sentence “Use an interstation spacing of 2.35 miles.”

In Exercise 10.11, change “Figure 10.8” to “Figure 10.7”.

In the table, the word “Acceleration” should be centered in its row.

CHAPTER 11 AIR TRANSPORTATION AND AIRPORTS

The columns in Table 11.6 have gotten misaligned. The first “Planning Factor” in “The forecast” section belongs in Column F. Realign the remaining columns accordingly.

In line 6 of paragraph 2, add “be” as the second word.

In Table 11.5, the entry “210” should be “174”. Also, add the words “with \( \gamma = 5 \text{ n.m.} \)” to footnote (a).

In the next-to-last column of Table 11.16, “Pr(i,j)” should be on one line.
Changes to Table 11.18:

<table>
<thead>
<tr>
<th>Nr</th>
<th>Op</th>
<th>Approach speed (kt)</th>
<th>Item in Table 11.17 or equation used</th>
<th>Time for op (sec.)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ld</td>
<td>Rules 3 and 4</td>
<td>5+45</td>
<td>To enter runway and take off</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ld</td>
<td>Rule 7</td>
<td>60</td>
<td>After Ld1 takes off</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>La</td>
<td>120 Rule 5 eqn, Rule 6 (11.4)</td>
<td>60-45=15</td>
<td>After Ld2 takes off</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>La</td>
<td>120 (11.4)</td>
<td>90</td>
<td>After La3 touches down</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ld</td>
<td>Rules 2, 3, and 4</td>
<td>45+5+45</td>
<td>After Ld4 touches down</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Hd</td>
<td>Rule 7</td>
<td>60</td>
<td>After Ld5 takes off</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>La</td>
<td>120 Rule 5 eqn, Rule 6 (11.4)</td>
<td>60-45=15</td>
<td>After Hd6 takes off</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>La</td>
<td>120 (11.4)</td>
<td>90</td>
<td>After Ld7 touches down</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Ld</td>
<td>Rules 2, 3, and 4</td>
<td>45+5+45</td>
<td>After Ld8 touches down</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Ld</td>
<td>Rule 7</td>
<td>60</td>
<td>After Ld9 takes off</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Ha</td>
<td>150 Rule 5 eqn, Rule 6 (11.5) with γ = 5 nm</td>
<td>48-45=3</td>
<td>After Ld10 takes off</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>La</td>
<td>120 (11.5) with γ = 5 nm</td>
<td>180</td>
<td>After Ha11 touches down</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>La</td>
<td>120 (11.4)</td>
<td>90</td>
<td>After La12 touches down</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>La</td>
<td>120 (11.4)</td>
<td>90</td>
<td>After La13 touches down</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Ld</td>
<td>Rules 2, 3, and 4</td>
<td>45+5+45</td>
<td>After Ld14 touches down</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Sd</td>
<td>Rule 7</td>
<td>60</td>
<td>After Ld15 takes off</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>La</td>
<td>120 Rule 5 eqn, Rule 6 (11.4)</td>
<td>60-45=15</td>
<td>After Sd16 takes off</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Sa</td>
<td>100 (11.5) with γ = 5 nm</td>
<td>174</td>
<td>After La17 touches down</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>La</td>
<td>120 (11.4)</td>
<td>90</td>
<td>After La18 touches down</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>La</td>
<td>120 (11.4) and Rule 2</td>
<td>90+45</td>
<td>After La19 touches down</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1562 26.03 minutes total</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>78.10 average time per op</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>46.09 ops/hr</td>
<td></td>
</tr>
</tbody>
</table>

In Figure 11.23, (a) remove the asterisk after “2499’’ for Runway Configuration No. 2, (b) make the second column heading “Runway Configuration”, and (c) “Ops/Br” should be “Ops/Hr” in the 4th column heading.

In the second line of text under Figure 11.24, the correct phrase is “Table 11.19 of 90 and 116”.

In Exercise 11.2(b), change “no growth” to “400,000 commercial passengers”.

In Exercise 11.4, add the sentence “Explain the planning factors that you adopt.”

In Exercise 11.6, change “medium” to “large”.

In Exercises 11.6(c) and 11.7, change “medium” to “large”.

In Exercise 11.8, change “135” to “150”.

In Exercise 11.10, change “practical annual capacities” to “annual service volumes”.

In Exercise 11.15(b), change “operations restrict it” to “operations are restricted”.

In Exercise 11.16, change “medium” to “large”.

CHAPTER 12 MOVING FREIGHT

In the second sentence of the Solution to Example 12.10, insert “the” between “added to” and “R_a”.

In the R calculation in the Solution to Example 12.10, “16.6 → 1.6” in two places. This changes “106,240” to “10,240” in two places, “111,040” to “15,040”, and “45.4 mph” to “72.8 mph”.

Just below Equation 12.14, insert “V is the ship’s velocity in knots, and” before “f is the friction …”.

Remove “V = the velocity in knots” in line 4.

In line 6 of the “Resistance to Wavemaking Phenomena” paragraph, move the comma to the end of the previous line.

Solution to Example 12.13. (a) Remove the calculations of the Froude number and underwater volume. (b) In the calculation of R_as, only “100,000 x 850” should be under the radical, not 201.83.

In the Solution to Example 12.14, “Equation 12.12” in the last line of text should be “Equation 12.14”.

The last word in Example 12.16 should be “towboat”, not “tugboat”.

In the Solution to Example 12.17, replace “2000” HP with “1500” HP both times it appears. The multiple 6.7 now becomes 5.0, making “2800” HP 2090 HP. The last calculation becomes 2.45 * 2090 ≈ 5120 HP.
At top of page, add “Barrel: 42 gallons of oil.”

In the last sentence in Exercise 12.6(c), change “occur between” to “occur Monday through Saturday between”.

In Exercise 12.16, use an engine/propeller efficiency of 65 percent.

CHAPTER 13 Toward A Sustainable Transportation System

“Solution to Example 3.1” should be “Solution to Example 13.1”.

In the Year 1960 row of Table 13.4, “6.03” should be “1.62” and “17.31” should be “9.82”.

Change “Solution to Example 13.1” to “Solution to Example 13.2”. The Solution should be reworded as:

The enlarged transit bus fleet would deliver 30 passengers/bus x (2 x 75,000 buses) x 30,662 miles = 138 billion passenger miles while consuming about 0.2 quads of diesel fuel. The number of passengers moved would be 30 pax/bus x 150,000 buses = 4,500,000, compared to 9.32 pax/bus x 75,000 buses = 699,000, representing an increase of 3,800,000 persons moved.

The single-driver automotive equivalent of this added bus use is 30,662 mi x 3,800,000 pax = 116.526 billion passenger miles. At 0.176 passenger-mi per 1000 BTU, single-occupancy autos would consume 0.6621 quads while carrying 116.526 billion passenger miles. At a cost of 0.1 quads of extra transit bus fuel, automobile fuel use can be reduced from 9.126 quads to 8.4639 quads, or by about 7.25 percent.

Table 13.4. In the Year 1990 column, “2,211,503” should be “2,511,503”. In the Year 2000 column, “4,326,667” should be “4,328,667”. Relabel the “Fleet” column as “Vehicles in use, 2000” and change “85,879,000” to “85,579,000”. Add to the Source “Tables 7.6, 7.5, and 6.3”.

Example 13.6. Change “70 percent” to “50 percent” and “domestic production in 2000” to “domestic production in 2001”. In the solution, replace “4 x 10⁶” with “0.5 x 8.05 x 10⁶”. This changes “7.665” to “7.713” and “3153” to “3143”.

Table 13.16. Units for all emissions are “gm/mi”.

In the Solution to Example 13.8, change “vpm” to “veh/min” in all three places.

In Figure 13.24, “Greensburgh” should be spelled “Greensburg”.

In Exercise 13.2, remove the words “automobiles and” from the second bullet item.

In Exercise 13.3(b), remove the first three words: “At 21 mpg, how many persons …

Change the first sentence of Exercise 13.6 to read “The report ‘Ten Years of Progress’ issued January 2002 by the Surface Transportation Policy Project can be found under ‘Reports’ at http://www.transact.org.”

Index

After “barges”, add “barrel, 760”.

“circuitry” should be “circuity”.

After “fully-actuated signal”, add “functional class, 49”.

Add “salvage value, 272”, “sample size, 57” and “scow, 664f”.

After “tugboat”, add “turning movements, 45”.

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