

# ERRATA

## *Nebraska Department of Transportation*

### *Roadway Design Manual*

#### **Chapter Three: Roadway Alignment**

June 2016	④ June 2018	⑧ February 2020
① February 2017	⑤ August 2018	⑨ May 2021
② July/August 2017	⑥ December 2018	⑩ January 2022
③ February 2018	⑦ September 2019	

The last update to the Roadway Design Manual (*RDM*) was in 2006. In the intervening years some design guidance has become obsolete, new/updated guidance has become available, offices of responsibility have changed, design procedures have been streamlined, etc. The NDOT is in the process of updating the *RDM* but, in the interim, the obsolete/incorrect guidance is being addressed through this document and a re-issued *RDM*. Page numbers cited in this document are referenced to the January 2022 Errata RDM. Deleted text in the Errata RDM is in green with a strike through (~~errata~~) and new/corrected text is in red (**correct**). Additions to previously added text is in blue (**added**). The following chapters have already been addressed:

- ⑧ Chapter One: Roadway Design Standards (updated on February 5, 2020)
- Chapter Three: Roadway Alignment (updated on June 17, 2011)
- Chapter Four: Intersections, Driveways and Channelization (updated on April 19, 2012)
- ⑦ Chapter Five: Interstates, Grade Separations and Interchanges (added on Aug. 9, 2019)
- Chapter Six: The Typical Roadway Cross-Section (updated on February 18, 2016)
- ⑤ Chapter Seven: Earthwork: (updated on August 2, 2018)
- Chapter Eight: Surfacing (updated on December 15, 2015)
- ⑥ Chapter Nine: Guardrail and Roadside Barriers (updated on December 13, 2018)
- ① Chapter Eleven: Highway Plans Assembly (updated on February 21, 2017)
- ② Chapter Twelve: Cost Estimating & Funding (updated on August 16, 2017)
- ① Chapter Fourteen: Traffic (updated on October 19, 2016)
- ③ Chapter Fifteen: Right-of-Way (updated on February 26, 2018)
- Chapter Sixteen: Pedestrian and Bicycle Facilities (added on February 8, 2016)
- ⑨ Chapter Seventeen: Resurfacing, Restoration and Rehabilitation (3R) Projects (updated on April 22, 2021)
- ⑧ Appendix H: "AASHTO Minimum Design Guidance" (updated on February 5, 2020)

## **THE FOLLOWING ITEMS PERTAIN TO THE ENTIRE MANUAL:**

June 2016 and all subsequent changes – Sections and EXHIBITS have been re-numbered as required by the errata. Chapter and EXHIBIT citations, Clarity task numbers, references, and internet links are updated to the latest edition of the *RDM* as are the Contents, List of Exhibits, and the Index

### June 2016

- The **Government Affairs Division** is now the **Local Projects Section** of the **Materials and Research Division**
- The Project Scheduling System (PSS) was replaced with Clarity®
- All references to Falcon have been removed, Falcon is no longer in use by **NDOR**
- Where possible, citations to Chapter Two: Roadway Design Process, are now to the Design Process Outline (DPO)
- Section 6, “Departure from Standards”, of Chapter One: Design Standards is now Appendix H, “Application of Design Standards”
- Section 10, “Pedestrian and Bicycle Facilities” of Chapter Ten: Miscellaneous Design Issues was used as the basis for Chapter Sixteen: Pedestrian and Bicycle Facilities
- The **Roadside Development Unit** in the **Planning and Project Development Division** is now the **Roadside Stabilization Unit**

### ① February 2017

- The **Planning and Project Development Division** is now the **Project Development Division**. Planning has been combined with the **Rail and Public Transportation Division** to create the **Intermodal Planning Division**
- The **Utilities Section** of the **Planning and Project Development Division** is now the **Utilities Unit** in the **Roadway Design Division**
- Section 11, “Maintaining Traffic During Construction”, of Chapter Ten: Miscellaneous Design Issues is now part of Section 6, “Work Zone Traffic Control” in Chapter Fourteen: Traffic

### ② July 2017

- All references to the **Nebraska Department of Roads (NDOR)** have been changed to the **Nebraska Department of Transportation (NDOT)**

### ③ February 2018

- 2011 Draft Public Rights-of-Way Accessibility Guidelines (PROWAG) replaced with Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (Proposed Guidelines (2011)), this is the same document with a different title

### ④ June 2018

- The **Roadside Stabilization Unit** in the **Project Development Division** is now the **Roadside Development and Compliance Unit**

## **THE FOLLOWING ITEMS PERTAIN TO THE ENTIRE MANUAL:**

### **⑤ August 2018**

- Section 5.G, “Railroads”, of Chapter Thirteen: Planning and Project Development is now part of Section 1, “Railroads” in Chapter Ten: Miscellaneous Design Issues
- Section 6, “Utilities”, of Chapter Thirteen: Planning and Project Development is now Section 11, “Utilities” in Chapter Ten: Miscellaneous Design Issues

### **⑥ December 2018**

- Plan Sheet numbering updated (See Chapter Eleven, EXHIBIT 11.1)

### **⑦ September 2019**

- The **Local Projects Section** in the **Materials and Research Division** has been combined with the **Rail and Public Transportation Section** in the **Intermodal Planning Division** to create the **Local Assistance Division**
- The **Intermodal Planning Division** is now the **Strategic Planning Division**
- AASHTO guidance and citations were updated to the May 2016 edition of the Interstate Green Book and the 2018 edition of the Green Book

### **⑧ February 2020**

- Section 1, “The Controlling Design Criteria”, Section 2, “Departure from Standards”, and Section 3, “Instructions for Completing NDOT Form 76” and their attendant Exhibits of Appendix H: Application of Design Standards are now Sections 8, 10, and 9 respectively of Chapter One: Roadway Design Standards. Appendix H is renamed to “AASHTO Minimum Design Guidance”.

### **⑨ May 2021**

- References to “Lateral Obstacle Clearance” changed to “Horizontal Clear Zone”
- ADA guidance and citations updated to the Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (With 2013 Supplement) (*Proposed Guidelines (2013)*)

### **⑩ January 2022**

- **EXHIBIT G** (Cost Item Checklist) of the DPO is now EXHIBIT 12.8 of the *RDM*
- **EXHIBIT P** (Earthwork Checklist) of the DPO is now EXHIBIT 7.16 of the *RDM*
- **EXHIBIT C** (Public Meeting Checklist) has been removed from the DPO, referrals to **EXHIBIT C** have been removed from the *RDM*
- **EXHIBIT M** (Guidance for Public Hearing/ Checklist) has been removed from the DPO, referrals to **EXHIBIT M** have been removed from the *RDM*

Page	Existing Text	Corrected Text
<b>Chapter Three</b>	This Chapter updated 6-17-2011	
	<b><u>ERRATA JUNE 2016</u></b>	
3-4	<u>EXHIBIT 3.2: Column one, “Location”, Row four</u> – “Desirable Design, Low-Speed Urban Roadways V < 45 mph”	“Desirable Design, Low-Speed Urban Roadways V ≤ 45 mph”
3-4	<u>EXHIBIT 3.2: Column one, “Location”, Row five</u> – “Minimum Design, Low-Speed Urban Roadways V < 45 mph”	“Minimum Design, Low-Speed Urban Roadways V ≤ 45 mph”
3-9, 3-10, 3-13, 3-16, & 3-19	<u>EXHIBITS 3.3c, 3.3d, 3.4c, 3.5c, and 3.6c</u>	Corrections to superelevation tables.
3-23	<b>Section 3.B: Vertical Curves</b> – “Vertical curves are not required on low-speed roadways (< 45 mph) where the algebraic difference in grades is less than 1%; high-speed roadways (≥ 50 mph) will generally require a vertical curve when the change in grade is greater than 0.5%.”	“Vertical curves are not required on low-speed roadways (≤ 45 mph) where the algebraic difference in grades is less than 1%; high-speed roadways (≥ 50 mph) will generally require a vertical curve when the change in grade is greater than 0.5%.”
3-25	<b>Section 3.B.2: Design (first paragraph)</b> – “The minimum vertical curve length in feet should be approximately three times the design speed of the roadway even when the desirable stopping sight distance is considerably less.”	“The minimum vertical curve length in feet should be approximately three times the design speed of the roadway when the length of curve is less than the desirable stopping sight distance.”

Page	Existing Text	Corrected Text
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Chapter Three

**③ ERRATA FEBRUARY 2018**

③ 3-32	<b>Section 3.C.2: Two-Lane, Two-Way Roadways – Passing Sight Distance</b> – “Passing sight distance is not one of the thirteen principal controlling design criteria (See Chapter One: <u>Design Criteria</u> , Section 1.A).”	“Passing sight distance is not one of the principal controlling design criteria (See Appendix H, “Application of Design Standards”).”
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**⑦ ERRATA SEPTEMBER 2019**

⑦ 3-2	<b>Section 2.A.5: Spiral Curve Transitions</b> – “For additional information see Chapter 3 of the <i>Green Book</i> (Ref. 3.1), “Spiral Curve Transitions”.	“For additional information see Chapter Five: <u>Interstates, Grade Separations, and Interchanges</u> , Section 3.C of this manual and Section 3.3.8.3, “Spiral Curve Transitions”, in Chapter 3 of the <i>Green Book</i> (Ref. 3.1).
⑦ 3-5	<b>Section 2.B.1: Transition Lengths (third paragraph after bullet points)</b> – “For simple curves 60 to 90% of the superelevation runoff length ( $L_r$ ) should be placed on the tangent prior to the curve. This percentage will vary based on the design speed and the number of lanes being rotated. To determine the appropriate percentage, see <b>TABLE 3-18</b> of the <i>Green Book</i> (Ref. 3.1).”	“For simple curves 50 to 80% of the superelevation runoff length ( $L_r$ ) should be placed on the tangent prior to the curve (the majority of agencies use 67%). See Section 3.3.8, “Transition Design Controls”, in Chapter 3 of the <i>Green Book</i> (Ref. 3.1) for additional information.”
⑦ 3-5 & 3-6	<b>Section 2.B.2: Axis of Rotation</b>	Third and fourth paragraphs – every reference to a median width of 40 feet (four in total) changed to 50 feet.

Page	Existing Text	Corrected Text
<b>Chapter Three</b>		
⑦ 3-7, 3-11, 3-14, & 3-17	<u>EXHIBITS 3.3a, 3.4a, 3.5a, and 3.6a</u>	Added a note referencing exhibit(s) in Chapter Six. Cross-section for <u>EXHIBITS 3.4a and 3.5a</u> corrected to current design guidance as shown in Chapter Six and to a depressed median width of 50 ft. of less.
⑦ 3-8, 3-12, 3-15, & 3-18	<u>EXHIBITS 3.3b, 3.4b, 3.5b, and 3.6b</u> – Note A: “60 to 90% of the runoff length should be placed on the tangent. See Reference 3.1, Exhibit 3.33 for the appropriate length.”	“50 to 80% of the runoff length should be placed on the tangent. See Reference 3.1, section 3.3.8 for additional information.”
⑦ 3-26	<u>EXHIBIT 3.9</u>	Added design speeds 15 thru 30 mph, 75 mph and 80 mph. Column for 40 ft. median changed to 50 ft. median. Updated values as necessary.
⑦ 3-31	<b>Section 3.C.1: Stopping Sight Distance</b>	<p>Added Text, after the third paragraph: “The following equation is used to determine a K value for a condition not shown in <u>EXHIBIT 3.9</u>.</p> $K = S_d^2 / 2158$ <p>This equation is derived from Eq. 3-44 in the Green Book (Ref. 3.1), <math>L = AS^2 / 2158</math>, substituting L/ K for A and intersection sight distance for S.”</p>

Page	Existing Text	Corrected Text
<b>Chapter Three</b>		
⑦ 3-33	<b>Section 3.D.1: Stopping Sight Distance (after second paragraph)</b> – “Time = acceptable time gap in traffic (in seconds) based on intersection conditions (See Chapter 3 of the <i>Green Book</i> , Ref. 3.1). <b>NDOT</b> uses a time gap of 8.8 sec. for the two-lane, left turn condition.”	“Time = acceptable time gap in traffic (in seconds) based on intersection conditions (See Chapter 9 of the <i>Green Book</i> , Ref. 3.1). <b>NDOT</b> uses a time gap of 8.8 sec. for the two-lane, left turn condition (the <b>NDOT</b> time gap is arrived at by adding an initial time gap of 7.5 sec. (Case B-1, left-turn condition from Section 9.5.3 in Chapter 9 of the <i>Green Book</i> , Ref. 3.1) plus 0.8 sec. (1.2 sec. x 4 for a driveway/intersection approach at a 4% grade) plus 0.5 sec. for each additional 12-foot lane (or for each 12 feet of median width).”
⑦ 3-33	<b>Section 3.D.1: Stopping Sight Distance</b>	Added Text, after fifth paragraph: “The following equation is used to determine a K value for a condition not shown in <u>EXHIBIT 3.14</u> .  $K = S_d^2 / (400 + 3.5S_d)$  This equation is derived from Eq. 3-49 in the <i>Green Book</i> (Ref. 3.1), $L = AS^2 / 400 + 3.5S$ , substituting L/ K for A and intersection sight distance for S.”
⑦ 3-35	<u>EXHIBIT 3.14</u>	Added design speeds 15 thru 30 mph, 75 mph and 80 mph. Column for 40 ft. median changed to 50 ft. median. Updated values as necessary.
⑦ 3-37	<b>Section 3.D.4: Vertical Curve with Obstructions</b>	Added last line to paragraph – “General Controls for Vertical Alignment” in Section 3.4.6.5 in Chapter 3 of the <i>Green Book</i> (Ref. 3.1) presents additional information on vertical clearance at undercrossings.”

Page	Existing Text	Corrected Text
<b>Chapter Three</b>		
<b>⑧ ERRATA FEBRUARY 2020</b>		
⑧ 3-7	<u>EXHIBIT 3.3a</u> – “For additional details, See Exhibits 6-7 through 6-10”	“For additional details, See Exhibits 6-3 through 6-6”
⑧ 3-17	<u>EXHIBIT 3.6a</u> – “For additional details, See Exhibit 6-14”	“For additional details, See Exhibit 6-10”
⑧ 3-20	<b>Section 3: VERTICAL ALIGNMENT DESIGN (second paragraph after bullets)</b> – “The vertical alignment should not be changed during the Final Design Phase (Activity 5500).”	“The vertical alignment should not be changed during the Plan Details Phase (Activity 5500).”
⑧ 3-37	<b>Section 3.D.4.a: Minimum Vertical Clearances for Overhead Facilities</b> – “The roadway designer should always check the overhead clearance based on the high point of the roadway (including the turf shoulders), which may or may not be at the profile grade point, and should allow sufficient clearance for a future 6-inch overlay, if possible.”	“The roadway designer should always check the overhead clearance based on the high point of the roadway (including the shoulders), which may or may not be at the profile grade point, and should allow sufficient clearance for a future 6-inch overlay, if practicable.”
⑧ 3-37	<b>Section 3.D.4.a: Minimum Vertical Clearances for Overhead Facilities (point 1)</b> – “... Utilities over the roadway shall never be less than 18 feet above the high point of the roadway, including the turf shoulders. ...”	“... Utilities over the roadway shall never be less than 18 feet above the high point of the roadway, including the shoulders. ...”



Page	Existing Text	Corrected Text
<b>Chapter Three</b>		
<b>© ERRATA MAY 2021</b>		
© 3-5 to 3-6	<b>Section 2.B.2: Axis of Rotation</b>	Paragraphs 3 and 4 – all references to a 50 ft. median width changed to 54 ft. (four in total)
© 3-11 to 3-16	<u>EXHIBIT 3.4 &amp; EXHIBIT 3.5</u> – “Depressed Median Width = 50 Foot or Less”	“Depressed Median Width = 54 Foot or Less”
© 3-26, 3-27	<u>EXHIBIT 3.9</u>	Column for a 50 ft. depressed median restored to 40 ft. Guidance for 50 ft. moved to pg. 3-27 and guidance added for a 54 ft. depressed median.
© 3-30	<u>EXHIBIT 3.10c</u> – “(4-Lane Divided w/50 ft. or 40 ft. Median and Crowned Lanes, Left-Turn Condition)”	“(4-Lane Divided w/Depressed ft. Median and Crowned Lanes, Left-Turn Condition)”
© 3-31	<b>Section 3.C.1: Stopping Sight Distance</b> – “Time = …plus 0.8 sec. (1.2 sec. x 4 for a driveway/ intersection approach at a 4% grade)…”	“Time = …plus 0.8 sec. (0.2 sec. x 4 for a driveway/ intersection approach at a 4% grade)…”
© 3-33	<b>Section 3.D.1: Stopping Sight Distance</b> – “Time = …plus 0.8 sec. (1.2 sec. x 4 for a driveway/ intersection approach at a 4% grade)…”	“Time = …plus 0.8 sec. (0.2 sec. x 4 for a driveway/ intersection approach at a 4% grade)…”
© 3-35, 3-36	<u>EXHIBIT 3.14</u>	Column for a 50 ft. depressed median restored to 40 ft. Guidance for 50 ft. moved to pg. 3-36 and guidance added for a 54 ft. depressed median.

Page	Existing Text	Corrected Text
<b>Chapter Three</b>		
<b><u>⑩ ERRATA JANUARY 2022</u></b>		
⑩ 3-2	<b>Section 2: HORIZONTAL ALIGNMENT DESIGN (first paragraph on page)</b> – “The horizontal alignment should not be changed during the Final Design Phase (Activity 5500).”	“The horizontal alignment should not be changed during the Plan Details Phase (Clarity Activity 5500).”
⑩ 3-6	<b>Section 2.B.3: Smoothing of Pavement Edge Profile</b> – “Angular breaks in the vertical profile of the pavement edge through the superelevation transition length should be rounded in the final design.”	“Angular breaks in the vertical profile of the pavement edge through the superelevation transition length should be rounded in Roadway Design Details (Clarity Task 5508).”
⑩ 3-6	<b>Section 2.B.3: Smoothing of Pavement Edge Profile</b> – “As an approximate guide, the minimum vertical curve length in feet can be set as numerically equal to the design speed in miles per hour; greater lengths should be used where practical.”	“As an approximate guide, the minimum vertical curve length in feet can be set as numerically equal to the design speed in miles per hour; greater lengths should be used where practicable.”
⑩ 3-21	<b>Section 3.A.1: Maximum Grades</b> – “Grades which are less than the maximum should be used whenever practical.”	“Grades which are less than the maximum should be used whenever practicable.”
⑩ 3-27	<u>EXHIBIT 3.9b</u>	The time gap value for the 54 ft. Median, Case B-3 Crossing Maneuver, was corrected from 6.5 sec to 7.7 sec to account for the median and right-turn lane. The length and K values were adjusted accordingly.

Page	Existing Text	Corrected Text
Chapter Three		
⑩ 3-32	<p><b>Section 3.C.1: Stopping Sight Distance (first paragraph on page)</b> – “The use of K values below the stopping sight distance values given in <u>EXHIBIT 3.9</u> for a New and Reconstructed project will require <b>Roadway Design Engineer</b> approval, a design exception from the <b>FHWA</b> for projects on the NHS, and/ or a relaxation of the <i>MDS</i> (Ref. 3.2) (See Chapter One: <u>Roadway Design Standards</u>, Section 10, of this manual).”</p>	<p>“The use of K values below the sight distance values given in <u>EXHIBIT 3.9</u> for a New and Reconstructed project will require <b>Roadway Design Engineer</b> approval and may require a relaxation of the <i>MDS</i> (Ref. 3.2) and/ or a design exception from the <b>FHWA</b> (See Chapter One: <u>Roadway Design Standards</u>, Section 10.C, of this manual).”</p>
⑩ 3-32	<p><b>Section 3.C.2: Two-Lane, Two-Way Roadways – Passing Sight Distance</b> – “It is not practical to design crest vertical curves to provide for passing sight distance.”</p>	<p>“It is not practicable to design crest vertical curves to provide for passing sight distance.”</p>
⑩ 3-34	<p><b>Section 3.D.1: Stopping Sight Distance (first paragraph on page)</b> – “The use of K values below the stopping sight distance values given in <u>EXHIBIT 3.14</u> for a New and Reconstructed project will require <b>Roadway Design Engineer</b> approval, a design exception from the <b>FHWA</b> for projects on the NHS, and/ or a relaxation of the <i>MDS</i> (Ref. 3.2) (See Chapter One: <u>Roadway Design Standards</u>, Section 10.C, of this manual).”</p>	<p>“The use of K values below the sight distance values given in <u>EXHIBIT 3.14</u> for a New and Reconstructed project will require <b>Roadway Design Engineer</b> approval and may require a relaxation of the <i>MDS</i> (Ref. 3.2) and/ or a design exception from the <b>FHWA</b> (See Chapter One: <u>Roadway Design Standards</u>, Section 10.C, of this manual).”</p>
⑩ 3-36	<p><u>EXHIBIT 3.14b</u></p>	<p>The time gap value for the 54 ft. Median, Case B-3 Crossing Maneuver, was corrected from 6.5 sec to 7.7 sec to account for the median and right-turn lane. The length and K values were adjusted accordingly.</p>

