ERRATA
Nebraska Department of Transportation
Roadway Design Manual

Chapter Four: Intersections, Driveways and Channelization

June 2016
① February 2017
② July/August 2017
③ February 2018
④ June 2018
⑤ August 2018
⑥ December 2018

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 December 2018 Errata RDM. Deleted text in the December 2018 Errata RDM is in green with a strike through (~~errata~~) and new/corrected text is in red (correct). The following chapters have already been addressed:

- ⑥ Contents (updated in December 2018)
- ⑥ List of Exhibits (updated in December 2018)
- Chapter Three: Roadway Alignment (updated on June 17, 2011)
- Chapter Four: Intersections, Driveways and Channelization (updated on April 19, 2012)
- 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)
- Chapter Seventeen: Resurfacing, Restoration and Rehabilitation (3R) Projects (added on March 26, 2014
- ⑥ Index (updated in December 2018)

The following items pertain to the entire manual:

- June 2016 and all subsequent changes – Chapter and EXHIBIT citations have been updated to the latest edition of the *RDM*
- ② July 2017 - All references to the **Nebraska Department of Roads** (**NDOR**) have been changed to the **Nebraska Department of Transportation** (**NDOT**)
- ⑥ December 2018 – Plan Sheet numbering updated (See Chapter Eleven, EXHIBIT 11.1)

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4-2	**Section 1.A: Types of Intersections –** "See Section 1.E of this chapter and Chapter One: Design Criteria, Section 11 for additional information."	"See Section 1.E of this chapter for additional information."
① 4-4	**Section 1.A.3: Roundabouts –** • "**Lanes:** the **Traffic Engineering Division** (**Traffic**) will recommend the number of lanes for the roundabout, including any auxiliary or by-pass lanes."	• "**Lanes:** the **Traffic Engineering Division** (**Traffic Engineering**) will recommend the number of lanes for the roundabout, including any auxiliary or by-pass lanes."
① 4-5	**Section 1.A.3: Roundabouts –** • "**Drives:** In rare instances when a driveway must have a direct access onto or near the roundabout it will look like a driveway (e.g. appropriate drive radius, use of a 2 inch slope curb. All access, both on and near the roundabout, will be coordinated with **Traffic**."	• "**Drives:** In rare instances when a driveway must have a direct access onto or near the roundabout it will look like a driveway (e.g. appropriate drive radius, use of a 2 inch slope curb. All access, both on and near the roundabout, will be coordinated with **Traffic Engineering**."
① 4-5	**Section 1.B.1: The Intersection of Two State Highways –** "The design of an intersection of two state highways requires coordination and input from the roadway designer, **District**, and the **Traffic Engineering Division** (**Traffic**)."	"The design of an intersection of two state highways requires coordination and input from the roadway designer, **District**, and **Traffic Engineering**."

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① 4-5	**Section 1.B.1: The Intersection of Two State Highways –** "The designer will alert **Traffic** of any changes to the intersection environment (the existing conditions and/or any changes throughout the design process)."	"The designer will alert **Traffic Engineering** of any changes to the intersection environment (the existing conditions and/or any changes throughout the design process)."
① 4-8	**Section 1.B.2: Rural Intersections –** "When the location of an intersection is on a horizontal or vertical curve, **Traffic** may be consulted regarding the need to add auxiliary lanes to separate the through traffic from the turning traffic."	"When the location of an intersection is on a horizontal or vertical curve, **Traffic Engineering** may be consulted regarding the need to add auxiliary lanes to separate the through traffic from the turning traffic."
① 4-9	**Section 1.B.4: Frontage Roads –** "**Traffic** should be consulted to determine the actual distance required and to determine if traffic signals are warranted at the frontage road intersection based on the traffic volumes."	"**Traffic Engineering** should be consulted to determine the actual distance required and to determine if traffic signals are warranted at the frontage road intersection based on the traffic volumes."
① 4-11	**Section 1.C.1: Capacity and Level of Service –** "**Traffic** performs capacity analysis with input from **Roadway Design**; **Roadway Design** in turn utilizes the capacity analysis results for the design of the intersection geometry."	"**Traffic Engineering** performs capacity analysis with input from **Roadway Design**; **Roadway Design** in turn utilizes the capacity analysis results for the design of the intersection geometry."
① 4-12	**Section 1.C.3.a: Intersection Skew w/Stop Control on Minor Roadway –** "Use of a skew angle greater than 15° requires **Unit Head** approval, with input from **Traffic**. The allowable skew for 3R projects will be based on the recommendations from **Traffic** and on the crash history of the intersection."	"Use of a skew angle greater than 15° requires **Unit Head** approval, with input from **Traffic Engineering**. The allowable skew for 3R projects will be based on the recommendations from **Traffic Engineering** and on the crash history of the intersection."

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① 4-12	**Section 1.C.3.a: Intersection Skew w/Stop Control on Minor Roadway –** "Method A (See EXHIBIT 4.8) is used when there are excessive impacts on one side of the roadway (e.g. wetlands, buildings, grain elevators), Method B is the preferred intersection realignment; Methods C and D should only be used under very low volume conditions or, if in urban areas, where a minimum distance is provided between the offset intersections (**Traffic** may analyze the intersection configuration for left turn conflicts, etc. and will determine the minimum required distance)."	"Method A (See EXHIBIT 4.8) is used when there are excessive impacts on one side of the roadway (e.g. wetlands, buildings, grain elevators), Method B is the preferred intersection realignment; Methods C and D should only be used under very low volume conditions or, if in urban areas, where a minimum distance is provided between the offset intersections (**Traffic Engineering** may analyze the intersection configuration for left turn conflicts, etc. and will determine the minimum required distance)."
① 4-17	**Section 1.C.6: Intersection Radius –** "For additional guidance see **FIGURES 9-15** and **9-16** of the *Green Book* (Ref. 4.1)."	Remove this text
① 4-18	**Section 1.C.8: Transit Services –** "The designer will consult with **Traffic** regarding the location and length of the bus turnout, which may be placed on the near side or far side of the intersection."	"The designer will consult with **Traffic Engineering** regarding the location and length of the bus turnout, which may be placed on the near side or far side of the intersection."
① 4-19	**Section 1.C.9: Signs –** "The designer will coordinate the design of the typical section and the geometry of the approach roadway with **Traffic** to allow for proper sign placement."	"The designer will coordinate the design of the typical section and the geometry of the approach roadway with **Traffic Engineering** to allow for proper sign placement."

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③ 4-19	**Section 1.C.10: Pedestrian Crosswalks –** "Curb ramps shall be constructed or reconstructed to meet the guidance found on the 2011 Draft Public Rights-of-Way Accessibility Guidelines (*PROWAG*) (Ref. 4.9) (web site) on all projects as required. For further information see Chapter Sixteen: Pedestrian and Bicycle Facilities, Section 7; Chapter Seventeen: Resurfacing, Restoration and Rehabilitation (3R) Projects, Section 12; and Chapter Fourteen: Traffic Engineering, Sections 1.G and 4.A."	"Curb ramps shall be constructed or reconstructed to meet the guidance found on the Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (*Proposed Guidelines (2011)*) (Ref. 4.9) (web site) on all projects as required. For further information see Chapter Sixteen: Pedestrian and Bicycle Facilities, Section 7; Chapter Seventeen: Resurfacing, Restoration and Rehabilitation (3R) Projects, Section 12; and Chapter Fourteen: Traffic, Sections 1.H and 4.A."
① 4-19	**Section 1.D: Turn Lanes: -** "When **Traffic** has determined that specific turning movements should be separated from through movements they will recommend that a turn lane be added to the project."	"When **Traffic Engineering** has determined that specific turning movements should be separated from through movements they will recommend that a turn lane be added to the project."
① 4-19	**Section 1.D: Turn Lanes: -** "**Traffic** may recommend right turn lanes, offset right turn lanes, free flow right turn lanes, or left turn lanes as warranted (See EXHIBITS 4.10 & 4.12)."	"**Traffic Engineering** may recommend right turn lanes, offset right turn lanes, free flow right turn lanes, or left turn lanes as warranted (See EXHIBITS 4.10 & 4.12)."
① 4-20	**Section 1.D: Turn Lanes: -** "**Traffic** will determine when TWLTL treatment is appropriate."	"**Traffic Engineering** will determine when TWLTL treatment is appropriate."
① 4-23	**Section 1.D.1: Turn Lane Length –** "The roadway designer will consult with **Traffic** to determine the recommended storage length at an intersection."	"The roadway designer will consult with **Traffic Engineering** to determine the recommended storage length at an intersection."

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4-23	**Section 1.D.2: Turn Lane Bay Taper Rate** – "The entering turn lane bay taper rate should be 15:1 for rural high-speed roadways (design speed ≥ 50 mph) (See EXHIBITS 4.9, 4.10 AND 4.24 THROUGH 4.28); the turn lane bay taper rate should equal the posted speed limit (at a minimum) for low-speed roadways (design speed ≤ 45 mph)."	"The entering turn lane bay taper rate should be 15:1 for rural high-speed roadways (design speed ≥ 50 mph) (See EXHIBITS 4.9, 4.10 AND 4.24 THROUGH 4.28); the turn lane bay taper length should equal the posted speed limit (at a minimum) for low-speed roadways (design speed ≤ 45 mph)."
① 4-24	**Section 1.D.3: Offset Right-Turn Lanes –** "An offset right-turn lane is generally used when recommended by **Traffic** or at the discretion of the **ADE**."	"An offset right-turn lane is generally used when recommended by **Traffic Engineering** or at the discretion of the **ADE**."
① 4-25	**Section 1.D.4: Turning Roadways at Intersections (Free-Flow Right Turn Lanes) –** "Based on the traffic counts and composition, **Traffic** may recommend the design of a turning roadway."	"Based on the traffic counts and composition, **Traffic Engineering** may recommend the design of a turning roadway."
① 4-25	**Section 1.E: Traffic Control –** "Traffic control is the responsibility of **Traffic**."	"Traffic control is the responsibility of **Traffic Engineering**."
① 4-25	**Section 1.E: Traffic Control –** "**Traffic** conducts an engineering study to evaluate the operation of an intersection and to determine the appropriate traffic control to be provided. It is essential that the roadway designer coordinate with **Traffic** regarding roadway geometry, intersection capacity, and traffic operations (See Chapter Fourteen: Traffic Engineering)."	"**Traffic Engineering** conducts an engineering study to evaluate the operation of an intersection and to determine the appropriate traffic control to be provided. It is essential that the roadway designer coordinate with **Traffic Engineering** regarding roadway geometry, intersection capacity, and traffic operations (See Chapter Fourteen: Traffic)."

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① 4-25	**Section 1.E: <u>Traffic Control</u> –** "Coordination with the **Rail and Public Transportation Division** is required where highway intersection signals are interconnected with rail-highway crossing signals (See Chapter Thirteen: <u>Planning and Project Development</u>, Section 5.G)."	"Coordination with the **Intermodal Planning Division** is required where highway intersection signals are interconnected with rail-highway crossing signals (See Chapter Thirteen: <u>Planning and Project Development</u>, Section 5.G)."
① 4-26	**Section 1.E.1: Unsignalized Intersections –** "In these situations **Traffic** may recommend the addition of auxiliary lanes to the intersection."	"In these situations **Traffic Engineering** may recommend the addition of auxiliary lanes to the intersection."
① 4-26	**Section 1.E.2: Signalized Intersections –** "The designer must coordinate with **Traffic** to verify that the proposed approach lanes and intersection design is capable of accommodating the design year traffic volumes."	"The designer must coordinate with **Traffic Engineering** to verify that the proposed approach lanes and intersection design is capable of accommodating the design year traffic volumes."
① 4-26	**Section 2: DRIVEWAYS –** "Any proposed change of a field entrance or driveway location in a rural area will be coordinated with the **Right-of-Way Division** (**ROW**) and with the **Utilities Section** (**Utilities**) to verify that there are no utility conflicts. Location changes of urban driveways will be coordinated with **ROW**, **Utilities**, the **Lighting Section**, and **Traffic**."	"Any proposed change of a field entrance or driveway location in a rural area will be coordinated with the **Right-of-Way Division** (**ROW**) and with the **Utilities Unit** in **Roadway Design** (**Utilities**) to verify that there are no utility conflicts. Location changes of urban driveways will be coordinated with **ROW**, **Utilities**, the **Lighting Unit**, and **Traffic Engineering**."
4-28 & 4-29	**Exhibits 4.14 & 4.15**	The transverse grading at a drive is 1:6 minimum (1:10 preferred)

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① 4-32	**Section 2.B: <u>Urban Driveways</u> –** "Driveway design with signal controls requires a traffic analysis by **Traffic** to coordinate signal design and the roadway/intersection geometry."	Driveway design with signal controls requires a traffic analysis by **Traffic Engineering** to coordinate signal design and the roadway/intersection geometry."
① 4-32	**Section 2.B: <u>Urban Driveways</u> –** "Driveway design involving shopping centers, truck stops, schools, plants with large parking lots, etc. require a special traffic analysis by **Traffic** to coordinate the number of lanes, traffic controls, and required storage lengths."	"Driveway design involving shopping centers, truck stops, schools, plants with large parking lots, etc. require a special traffic analysis by **Traffic Engineering** to coordinate the number of lanes, traffic controls, and required storage lengths."
① 4-38	**Section 5: CHANNELIZATION –** "A traffic analysis, identifying the relative importance of conflicting movements, is performed by **Traffic** to establish the type of channelization to be used."	"A traffic analysis, identifying the relative importance of conflicting movements, is performed by **Traffic Engineering** to establish the type of channelization to be used."
① 4-38	**Section 5: CHANNELIZATION –** "The designer should coordinate with **Traffic** throughout intersection design regarding channelization and other issues."	"The designer should coordinate with **Traffic Engineering** throughout intersection design regarding channelization and other issues."
① 4-41	**Section 5.A: <u>Islands</u> –** "1. If the intersection warrants signalization within five years of the programmed construction the project may include signals, based on a recommendation from **Traffic**. ···"	"1. If the intersection warrants signalization within five years of the programmed construction the project may include signals, based on a recommendation from **Traffic Engineering**. ···"

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4-42	**Section 5.B.2: Median Types** – 1. "Flush Medians – Flush medians are typically used on urban highways and streets. These medians are often used as two-way left-turn lanes in urban areas (See Section 5.C)."	1. "Flush Medians – Flush medians are typically used on urban highways and streets. These medians are often used as two-way left-turn lanes in urban areas."
4-43	**Section 5.B.3: Median Width –** "The desirable depressed median width for a 4-lane freeway is 54 feet, the desirable depressed median width for an expressway is 40 feet (for minimum median widths see the *MDS*, Ref. 4.7)."	"The desirable depressed median width for an Interstate is 64 feet, the desirable depressed median width for a 4-lane freeway is 54 feet, and the desirable depressed median width for an expressway is 50 feet."
4-43	**Exhibit 4.23**	Removed the option of a 3 ft. surfaced median shoulder.
4-44	**Section 5.B.4.a: Type A Median Breaks** – "Type A median breaks (EXHIBITS 4.24, 4.25 & 4.27) may be used at intersections of the mainline with roadways having a classification of "Other Arterial" or higher and at intersections with paved public roads where there is a high probability of turning vehicles blocking the opposing turning driver's line of sight (the left turn lanes of a Type A median break are offset so that the driver's line of sight will not be obstructed)."	"Type A median breaks (EXHIBITS 4.24, 4.25, 4.27 & 4.30) may be used at intersections of the mainline with roadways having a classification of "Other Arterial" or higher and at intersections with paved public roads where there is a high probability of turning vehicles blocking the opposing turning driver's line of sight (the left turn lanes of a Type A median break are offset so that the driver's line of sight will not be obstructed)."

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① 4-44	**Section 5.B.4.a: Type A Median Breaks –** "At other locations a special study by **Traffic** will be required to justify the use of a Type A median break."	"At other locations a special study by **Traffic Engineering** will be required to justify the use of a Type A median break."
① 4-44	**Section 5.B.4.a: Type A Median Breaks –** "3. A Storage length provided by **Traffic**. ···"	"3. A Storage length provided by Traffic **Engineering**. ···"
4-44	**Section 5.B.4.b: Type B Median Breaks** – "Type B median breaks (EXHIBITS 4.24, 4.26 & 4.28) are appropriate for use at mainline intersections with gravel county roads, with housing development intersections, and with rural commercial driveways."	"Type B median breaks (EXHIBITS 4.24, 4.26, 4.28 & 4.31) are appropriate for use at mainline intersections with gravel county roads, with housing development intersections, and with rural commercial driveways."
① 4-44	**Section 5.B.4.b: Type B Median Breaks** – "**Traffic** should be consulted for the appropriate storage length if the mainline traffic volume is over 9000 ADT, if the opposing peak hour traffic volume is over 500, if the peak hour turning traffic volume is 100 VPH or greater, and for rural commercial driveways."	"**Traffic Engineering** should be consulted for the appropriate storage length if the mainline traffic volume is over 9000 ADT, if the opposing peak hour traffic volume is over 500, if the peak hour turning traffic volume is 100 VPH or greater, and for rural commercial driveways."

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4-45	**Section 5.B.4.c: Type C Median Breaks** – "Type C median breaks (EXHIBITS 4.24, 4.26 & 4.29) are appropriate for use at mainline intersections with farmsteads /rural residence driveways. The length of a Type C median break consists of: 1. A 15:1taper to shift the turning traffic to the left of the through lane, And 2. A storage length of 50 feet for two cars at 25 feet per car."	"Type C median breaks (EXHIBITS 4.24, 4.26, 4.29, 4.32 & 4.33) are appropriate for use at mainline intersections with farmsteads /rural residence driveways. The length of a Type C median break consists of a 15:1 taper to shift the turning traffic to the left of the through lane."
4-45	**Section 5.B.4.d: Type D Median Breaks** – "Type D median breaks (EXHIBIT 4.29) are used at an intersection with a field entrance."	"Type D median breaks (EXHIBITS 4.29 & 4.34) are used at an intersection with a field entrance."
4-49	**Exhibit 4.27**	Median shoulders are 4 ft. in width instead of 3 ft.; the deceleration lane length is calculated beginning at an 8 ft. offset from the lane to the outside edge of the median shoulder (instead of the inside edge); the turn lane shall be 16 ft. in width through the taper and 12 ft. in width when parallel to the through lane (had been 12 ft. in width throughout).
4-50	**Exhibit 4.28**	Median shoulders are 4 ft. in width instead of 3 ft.; the deceleration lane length is calculated beginning at an 8 ft. offset from the lane to the outside edge of the median shoulder (instead of the inside edge); the auxiliary lane width shall be 12 ft. instead of 15 ft

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4-51	**Exhibit 4.29 – Type C**	Median shoulders are 4 ft. in width instead of 3 ft.; the distance from the centerline of the side street to the median nose is 30 ft. instead of 36 ft.
4-51	**Exhibit 4.29 – Type D**	Median shoulders are 4 ft. in width instead of 3 ft.; the distance from the centerline of the side street to the median nose is 30 ft. instead of 36 ft.; the design vehicle is a WB-62 instead of a SU
4-52, 4-53, 4-54, 4-55 & 4-56	**Exhibits 4.30, 4.31, 4.32, 4.33 & 4.34**	New exhibits showing geometrics for median breaks for a 50 ft. depressed median.
③ 4-57	**Section 6: REFERENCES** – "4.9 - Public Right-of-Way Access Advisory Committee (PROWAAC), "2011 Draft Public Rights-of-Way Accessibility Guidelines" (*PROWAG*), Washington, D.C., 2011 (web site)"	"4.9 - Architectural and Transportation Compliance Board, Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (*Proposed Guidelines (2011)*), Washington, D.C., 2011 (web site)"