National Committee on
Uniform Traffic Control Devices

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Item Number: 25B-MKG-01

NCUTCD PROPOSAL FOR CHANGES TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

COMMITTEE / TASK FORCE:	Markings Technical Committee
ITEM NUMBER:	25B-MKG-01
TOPIC:	Lane Reduction Markings
ORIGIN OF REQUEST:	Lane Reduction Signing and Markings MCTF
AFFECTED SECTIONS OF MUTCD:	3B.07, 3B12

DEVELOPMENT HISTORY:
Concurrence from RWSTC: 06/12/2025
Approved by Markings TC: 06/26/2025
Approved by NCUTCD Council: .....

This is a proposed change to the MUTCD that has been developed by a technical committee, joint committee, or joint task force of the NCUTCD. The NCUTCD is distributing this to its sponsoring organizations for review and comment. Sponsor comments will be considered in revising the proposal prior to NCUTCD Council consideration. This proposal does not represent a revision of the MUTCD and does not constitute official MUTCD standards, guidance, options, or support. If approved by the NCUTCD Council, the recommended changes will be submitted to FHWA for consideration for inclusion in a future MUTCD revision. The MUTCD can be revised only through the federal rulemaking process.

SUMMARY:
Since 2013, a joint effort between the Regulatory & Warning Signs Technical Committee and Markings Technical Committee has advanced research regarding lane reduction signing and markings. NCUTCD discussions regarding consistency of signing and differentiation of pavement marking types have informed the research cited in the preparation of this proposal. This proposal recommends retaining several changes made to the MUTCD with the release of the 11th Edition and implementing changes related to signing and pavement markings that are supported by research completed and released during the time the 11th Edition was in development.

This proposal only contains recommendations relating to markings; it is a companion to the Lane Reduction Signing proposal, 25B-RW-01.

DISCUSSION:
On freeways, expressways, and conventional roads, reductions in the number of lanes require the attention of road users. Where the reduction in the number of lanes is due to a “trap lane” or continuing lane terminating as a turning or exiting lane, guide signing provides the primary

source of information for road users to make a choice regarding lane selection. Pavement markings provide information regarding the status of the lane and indicate the need to find and understand signing. Where the reduction in the number of lanes is due to a physical reduction in the number of lanes by means of a lane reduction taper, warning signs and pavement markings are the primary source of information.

Both types of lane reduction incur high workloads for road users, with increased intensity observed for both the Operation and Guidance Tasks. While the Navigation Task is not typically a factor in the second scenario, the physical reduction in the number of lanes, information acquisition for Guidance Task may be more intense, requiring frequent variations in seek distance, additional mirror glances, and head checks. For most free-flow roadways where a continuous right lane is terminated, these workload tasks affect more road users than if the left lane were terminated, and involve heavy vehicles and long vehicles, which use the right-most lane or lanes to promote order and reduce speed differentials in the left-most (passing) lanes. Typically, the left lane on free-flow roads such as freeways and expressways often exhibit lower occupancies due to the application of the basic rule, thus reducing the workload associated with lane change maneuvers required to vacate terminating left lanes.

Because there are two types of non-continuing lanes, it is crucial that pavement markings and signing are differentiated between physical reductions in the number of lanes and "lane drops," where a lane becomes a turn lane or exit-only lane. Further differentiation along the roadway segment leading into the lane reduction is accomplished using pavement marking and signing sequences that treat lane reductions and lane drops uniquely. The segments of roadway preceding, including, and following the lane reduction are divided into four zones, which are the upstream zone (ahead of the first warning sign), the approach zone (between the first warning sign and the beginning of the taper), the transition zone (along the lane reduction taper), and the downstream zone. The use of differing pavement markings in the approach zone and transition zone aids road users in discerning the presence of a non-continuing lane and the location of the beginning of the lane reduction taper. Corresponding differentiation in warning signs also allows for identification of the upstream advance warning and the beginning of the taper, the latter location requiring immediate action by the user. The length of the approach zone is typically congruent with Condition-A distance from Table 2C-3, and the taper length determined by applicable geometric design standards.

This proposal incorporates research results from the following study;

- Signing, in Combination with Lane Markings, in Advance of Lane Reduction Transitions, February 2019 (available at https://pooledfund.org/details/study/565 with download links under “Documents”)

Proposed revisions to pavement markings in Part 3 are intended to increase the differentiation between continuing lanes, non-continuing lanes, and lane reduction tapers. This is accomplished by changing the pavement marking pattern adjacent to the terminating lane. Upstream of the high judgment distance in Table 2C-3, a broken lane line is indicated, no change from current practice. Within the approach zone to the lane reduction, a dotted lane line is used in conjunction with a solid lane line adjacent to the continuing lane, which indicates that movements out of the non-continuing lane are permissible, but movements into the lane are discouraged. This proposed marking pattern contrasts with the single dotted lane line used to separate a continuing lane from a non-continuing lane that does NOT terminate in a lane reduction but is instead a mandatory movement lane, where movement between the lanes is not discouraged. Along the length of the lane reduction taper, a dotted extension marking is proposed, indicating a change from a full-width lane to a lane reduction taper, consistent with

existing practice in numerous states, including Illinois, Virginia, North Carolina, Florida, and other states that use these markings in areas where roadway geometry may not be apparent. The use of different patterns in the upstream, approach, and transition zones associated with a physical reduction in the number of lanes aids human and machine vehicle operators in differentiating between lane reductions and lane drops where the non-continuing lane does not terminate. Use of markings throughout the entire length of the sequence will aid vehicle operators in remaining centered in the continuing lane while also improving recognition of the lane reduction taper.

The proposed changes to Part 3 are summarized below:

- Modifying the text in Section 3B.07 for use of a dotted lane line in conjunction with a solid lane line adjacent to the continuing lane within the approach zone of entrance ramps
- Modifying Figure 3B-10 to match the proposed text changes in Section 3B.07
- Modifying the text in Section 3B.12 for use of a dotted lane line in conjunction with a solid lane line adjacent to the continuing lane within the approach zone of other lane reduction transitions
- Modifying Figure 3B-14 to match the proposed text changes in Section 3B.12

Proposed revisions by the Regulatory & Warning Signs Technical Committee in the companion proposal address the results of research related to the effectiveness of warnings signs for lane reductions. The R/W language proposes a new warning sign intended for use at the beginning of the lane reduction taper to clearly indicate the end of the full width of the non-continuing lane, reinforcing the change from the dotted lane line with solid line to the dotted extension line used along the length of the lane reduction taper. The use of taller delineator panels (similar to object markers) is addressed in the companion proposal while the use of chevrons in non-curvilinear segments is discouraged.

RECOMMENDED MUTCD CHANGES:

The following present the proposed changes to the current MUTCD within the context of the current MUTCD language. Proposed additions to the MUTCD are shown in blue underline and proposed deletions from the MUTCD are shown in ~~red strikethrough~~. Changes previously approved by NCUTCD Council (but not yet adopted by FHWA) are shown in green double underline for additions and ~~green double strikethrough~~ for deletions. In some cases, background comments may be provided with the MUTCD text. These comments are indicated by [bracketed white text in shaded green]. Deletions made by a technical committee, joint committee, or task force after initial distribution to sponsoring organizations are shown in ~~highlighted red strikethrough and sans-serif text~~. Additions made by a technical committee, joint committee, or task force after initial distribution to sponsoring organizations are shown in underline blue and sans-serif text.

PART 3
MARKINGS

CHAPTER 3B. PAVEMENT AND CURB MARKINGS

Section 3B.07 White Lane Line Markings for Non-Continuing Lanes

Standard:

01 **A normal width dotted white line marking shall be used as the lane line to separate a through lane that continues beyond the interchange or intersection from an adjacent deceleration or acceleration lane.**

02 **For exit ramps with a parallel deceleration lane, a normal width dotted white lane line extension shall be installed from the upstream end of the taper to the theoretical gore or to the upstream end of a solid white lane line, if used, that extends upstream from the theoretical gore as shown in Drawings A and C in Figure 3B-9.**

03 **For an exit ramp with a tapered deceleration lane, a normal width dotted white line extension shall be installed from the theoretical gore through the taper area such that it meets the edge line at the upstream end of the taper as shown in Drawing B in Figure 3B-9.**

04 **For entrance ramps with a parallel acceleration lane, a normal width dotted white lane line shall be installed from the theoretical gore or from the downstream end of a solid white lane line, if used, that extends downstream from the theoretical gore, to a point at least one-half the distance from the theoretical gore to the downstream end of the acceleration taper, as shown in Drawing A in Figure 3B-10.**

Option:

04a For entrance ramps with a parallel acceleration lane, a double white line consisting of a normal width solid white line adjacent to traffic traveling in the continuing lane, and a normal width dotted white lane line adjacent to traffic traveling in the acceleration lane, may be installed from the theoretical gore or from the downstream end of a solid white lane line, if used, that extends downstream from the theoretical gore, to a point at least one-half the distance from the theoretical gore to the upstream end of the acceleration taper, as shown in Drawing A in Figure 3B-10.

05 For entrance ramps with a parallel acceleration lane, a normal width dotted white line extension may be installed from the downstream end of the dotted white lane line to the downstream end of the acceleration taper, as shown in Drawing A in Figure 3B-10.

06 For entrance ramps with a tapered acceleration lane, a normal width dotted white line extension may be installed from the downstream end of the channelizing line adjacent to the through lane to the downstream end of the acceleration taper, as shown in Drawings B and C in Figure 3B-10.

Standard:

07 **A wide dotted white lane line shall be used:**

- **A. As a lane drop marking in advance of lane drops at exit ramps to distinguish a lane drop from a normal exit ramp (see Drawings A, B, and C in Figure 3B-11),**
- **B. In advance of freeway route splits with dedicated lanes (see Drawing D in Figure 3B-11),**
- **C. In advance of freeway route splits with an option lane (see Drawing E in Figure 3B-11),**
- **D. To separate a through lane that continues beyond an interchange from an adjacent continuous auxiliary lane between an entrance ramp and an exit ramp (see Drawing F in Figure 3B-11),**

E. As a lane drop marking in advance of lane drops at intersections to distinguish a lane drop from an intersection through lane (see Drawing A in Figure 3B-12), and

F. To separate a through lane that continues beyond an intersection from an adjacent auxiliary lane between two intersections (see Drawing B in Figure 3B-12).

Guidance:

08 *Lane drop markings used in advance of lane drops at freeway and expressway exit ramps should begin at least ½ mile in advance of the theoretical gore.*

09 *On the approach to a multi-lane exit ramp having an optional exit lane that also carries through traffic, lane line markings should be used as illustrated in Drawing B in Figure 3B-11.*

10 *Lane drop markings used in advance of lane drops at intersections should begin a distance in advance of the intersection that is determined by engineering judgment as suitable to enable drivers who do not desire to make the mandatory turn to move out of the lane being dropped prior to reaching the queue of vehicles that are waiting to make the turn. The lane drop markings should begin no closer to the intersection than the most upstream regulatory or warning sign associated with the lane drop.*

11 *The dotted white lane lines that are used for lane drop markings and that are used as a lane line separating through lanes from auxiliary lanes should consist of line segments that are 3 feet in length separated by 9-foot gaps.*

Support:

12 Sections 3B.21 and 3B.23 contain information regarding other markings that are associated with lane drops, such as ONLY word pavement markings and lane-use arrows.

13 Section 3B.12 contains information about the lane line markings that are to be used for transition areas where the number of through lanes is reduced at a location that is not at an interchange or intersection.

Option:

14 In the case of a lane drop at an exit ramp or intersection, a solid white line may replace a portion, but not all of the length, of the wide dotted white lane line.

Figure 3B-10. Examples of Dotted Line and Channelizing Line Applications for Entrance Ramp Markings (Sheet 1 of 2)

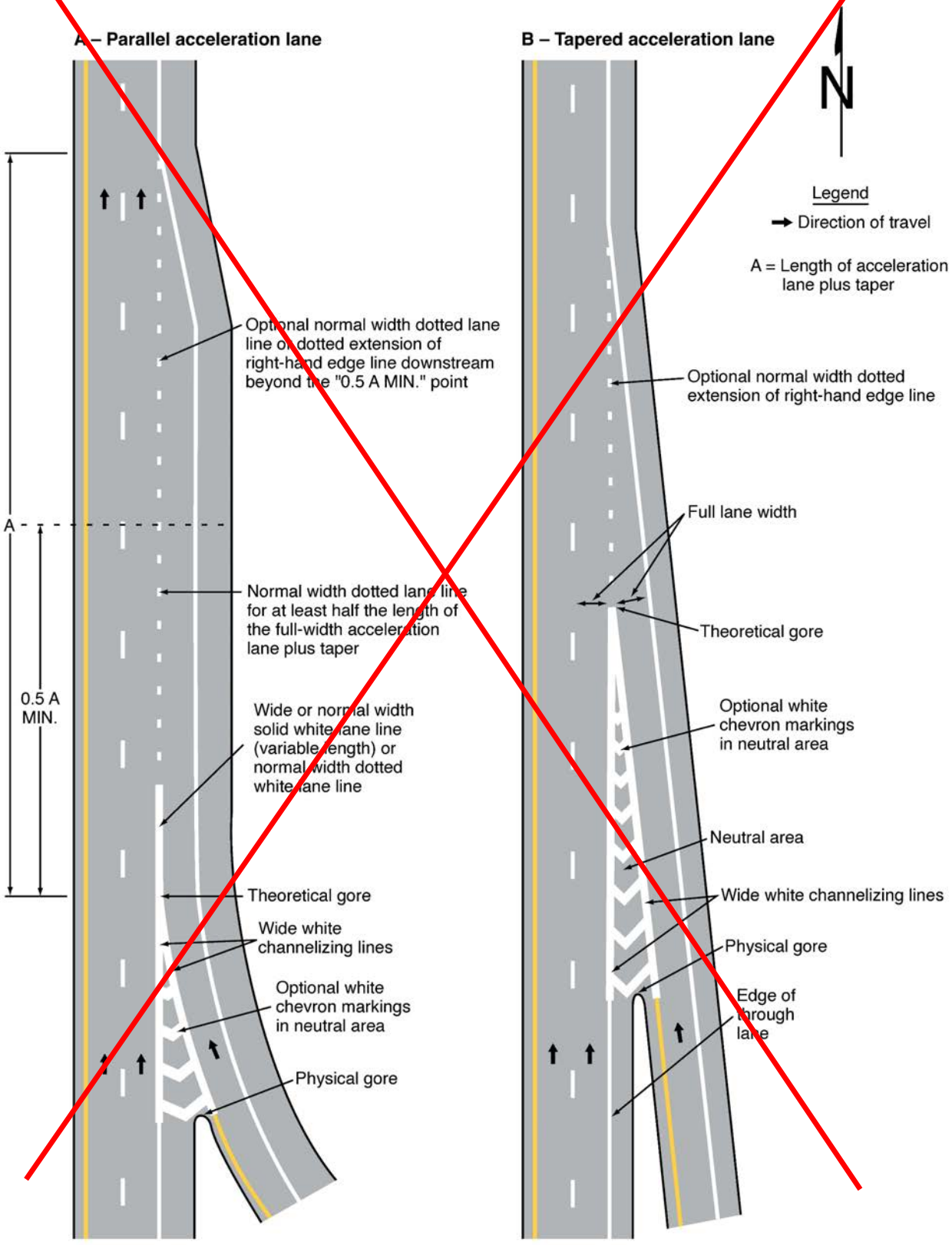

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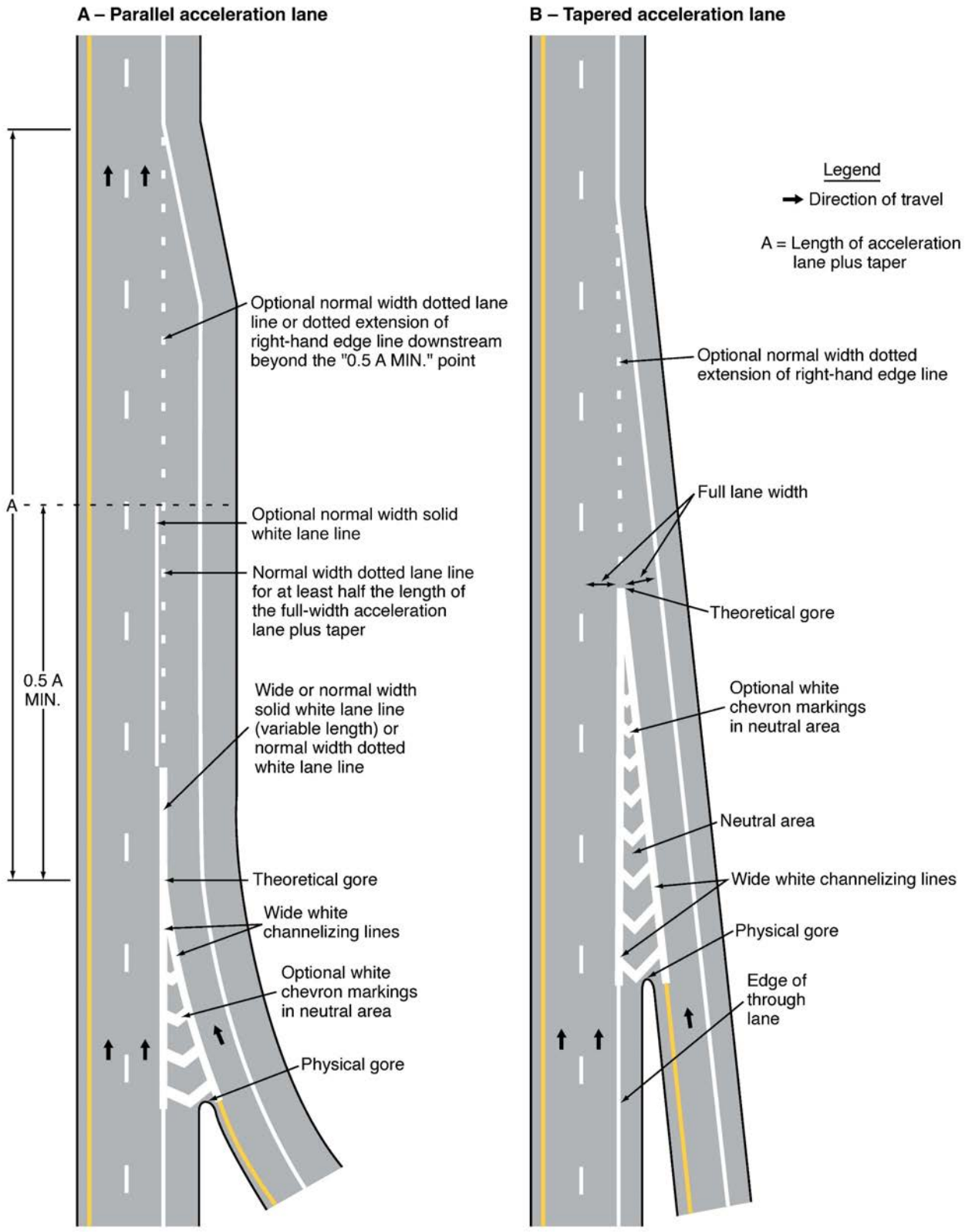
Figure 3B-10. Examples of Dotted Line and Channelizing Line Applications for Entrance Ramp Markings (Sheet 1 of 2)



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Section 3B.12 Lane-Reduction Transitions

Support:

01 A lane-reduction is where the number of through lanes is reduced at a location that is not at an interchange or intersection because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane.

02 Section 3B.07 contains information on pavement markings for lane drops and splits.

03 Section 2C.47 contains information for warning signing used for lane reductions.

Standard:

04 Lane-reduction transitions (see Figure 3B-14) shall include the following elements:

A. A no-passing zone (see Section 3B.03) to prohibit passing in the direction of the convergence and through the transition area except where not applicable such as one-way streets, expressways, and freeways; and

B. An edge line (see Section 3B.09) in the direction of the convergence and through the transition area, except as provided in Paragraph 6 of this Section.

Guidance:

05 *Except as provided in Paragraph 6 of this Section, the edge line marking should be installed from the location of the Lane Ends warning sign to beyond the beginning of the narrower roadway.*

Option:

06 On roadways with operating speeds less than 25 mph where curbs clearly define the roadway edge in the lane-reduction transition, or where a through lane becomes a parking lane, the edge line may be omitted as determined by engineering judgment.

Guidance:

07 *Lane-reduction transitions should include the following elements:*

A. Delineators installed adjacent to the lane or lanes reduced for the full length of the transition and should be so placed and spaced (see Section 3G.04) to show the reduction except as provided in Paragraph 13 of this Section and except as provided in Paragraph 2 of Section 3G.03 for freeways and expressways,

B. Lane-reduction arrow markings (see Drawing ~~F~~ I in Figure 3B-21) [Listed as a known error by FHWA] on the roadway with a speed limit of 45 mph or more, and

C. A termination of the broken white lane line at ~~a point that is ¼ of~~ the advance placement distance (see Section 2C.04) between the Lane Ends sign (see Section 2C.47) and the point where the transition taper begins.

D. A double white line consisting of a normal width solid white line adjacent to traffic traveling in the continuing lane, and a normal width dotted white lane line adjacent to traffic traveling in the non-continuing lane, between the point where the broken white line is terminated to the point where the transition taper begins.

08 *For roadways having a speed limit of 45 mph or greater, the transition taper length for a lane-reduction transition should be computed by the formula L = WS, where L equals the taper length in feet, W equals the width of the offset distance in feet, and S equals the 85th-percentile speed or the speed limit in mph, whichever is higher. For roadways where the speed limit is less than 45 mph, the formula $L = WS^2/60$ should be used to compute the taper length.*

09 *The minimum lane reduction transition taper length should be 100 feet in urban areas and 200 feet in rural areas.*

10 *Where observed speeds exceed speed limits, longer tapers should be used.*

Option:

10a A normal width dotted white lane line or dotted white line extension may be installed from the point where the transition taper begins to the point where the transition taper ends.

11 The minimum taper length may be less than 100 feet on roadways where the operating speed is less than 25 mph.

12 On new construction, where no speed limit has been established, the design speed may be used in the transition taper length formula.

13 On low-speed urban roadways where curbs clearly define the roadway edge in the lane-reduction transition, or where a through lane becomes a parking lane, delineators may be omitted as determined by engineering judgment.

14 Where a lane-reduction transition occurs on a roadway with a speed limit of less than 45 mph, lane-reduction arrow markings may be used.

15 Lane-reduction arrow markings may be used in long acceleration lanes based on engineering judgment.

~~16 A dotted white line may be used between the point where the broken white lane line is terminated to the point where the transition taper begins.~~ [Text included as part of Paragraph 07 Part D and changed from a “may” to a “should” condition]

Figure 3B-14. Examples of Applications of Lane-Reduction Transition Markings

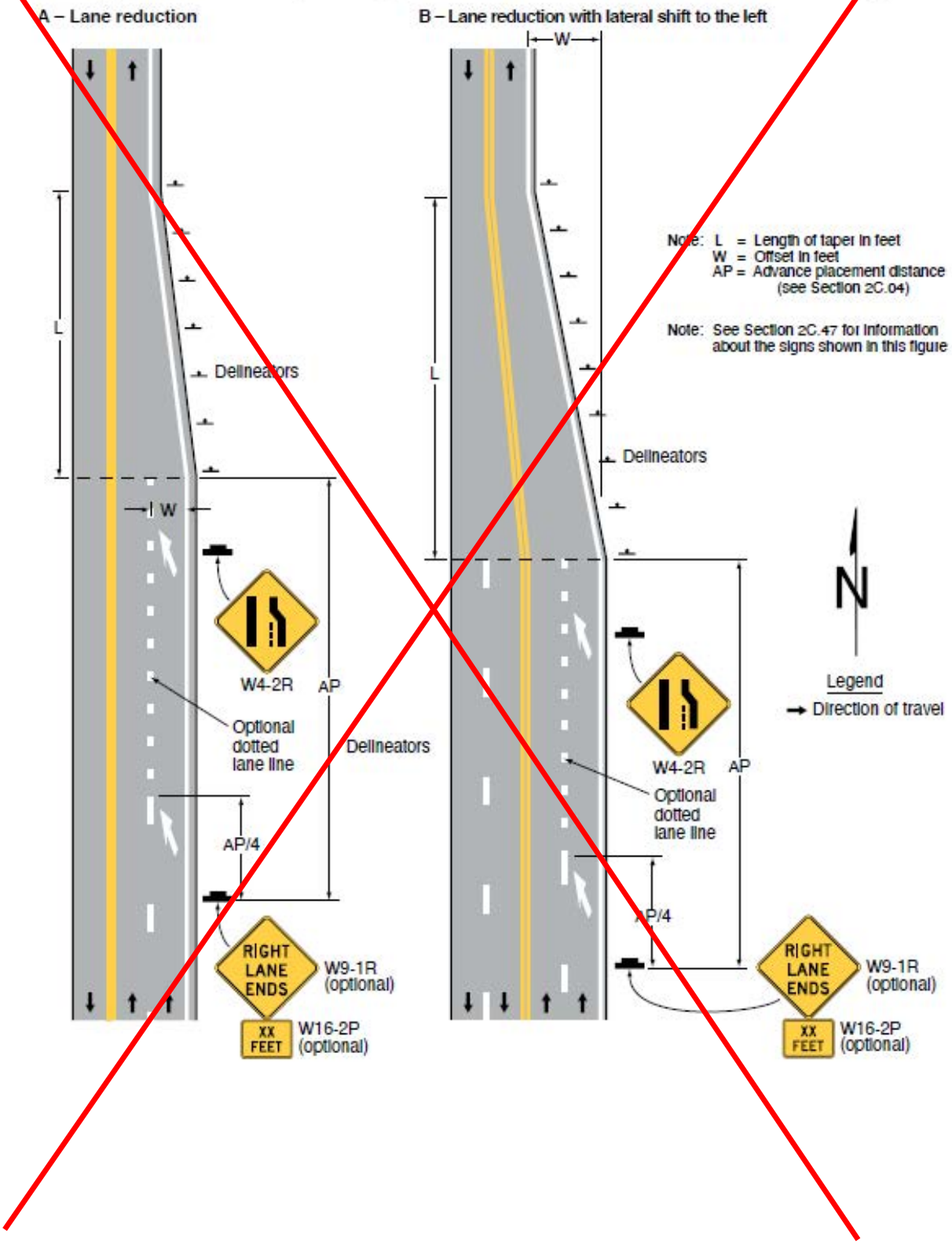

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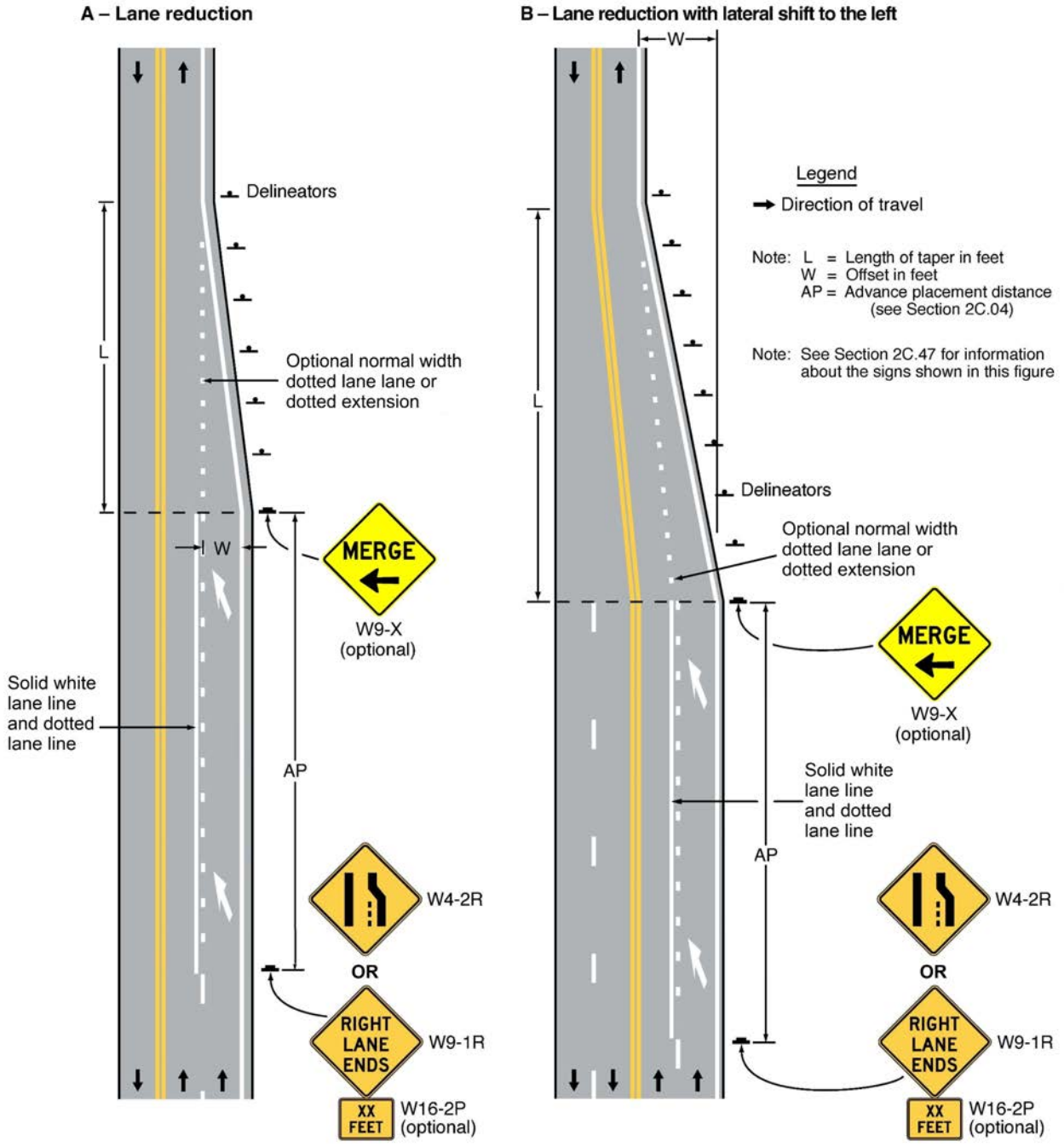
Figure 3B-14. Examples of Applications of Lane-Reduction Transition Markings



[Similar changes will be made to markings and sign type/location on Figure 2C-13 in the 25B-RW-01 companion proposal]