



National Committee on Uniform Traffic Control Devices

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Item No.: 20B-TTC-01

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NCUTCD Proposal for Changes to the Manual on Uniform Traffic Control Devices

TECHNICAL COMMITTEE: Temporary Traffic Control Technical Committee
ITEM NUMBER: 20B-TTC-01
TOPIC: Typical Application Refinement and Stopping Sight Distance
ORIGIN OF REQUEST: Craig Rhodes (TTC technical committee)
AFFECTED SECTIONS OF THE MUTCD: Section 6E.07
Notes for Figure 6H-10
Notes for Figure 6H-27, Figure 6H-27
Notes for Figure 6H-30, Figure 6H-30
Notes for Figure 6H-31, Figure 6H-31
Notes for Figure 6H-35
Notes for Figure 6H-40
Notes for Figure 6H-44
TASK FORCE MEMBERS: Ryan Lancaster (chair), Tim Baughman, Neil Boudreau, David Church, Dave Royer, Jim Bragdon, Fred Hanscom, Charles Adams, Laura Huizinga, Craig Rhodes, Tom Macchione, Scott Tison, John Leonard

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DEVELOPMENT HISTORY:

- Approved by Task Force: 04/14/2020
- Approved by Technical Committee: 06/17/2020
- Approved by NCUTCD Council: MM/DD/YYYY

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This is a proposal for recommended changes to the MUTCD that has been developed by a technical committee of the NCUTCD. The NCUTCD is distributing it 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, or options. 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.

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SUMMARY:

One section and seven typical applications (TAs) are proposed to be revised. Flagger symbols and a flagging note are added to TA-27. A note in TA-10 is revised to match the note in TA-27. LEFT LANE CLOSED AHEAD signs are added to the figures of TAs 30 and 31 and the note indicating the optional use of the sign is deleted. The work space area of TA-30 is revised.

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DISCUSSION

The following describes proposed revisions to Section 6E.07 and temporary traffic control typical applications 10, 27, 30, 31, 35, 40, and 44 of Chapter 6H.

Section 6E.07

It is proposed to revise “sight distance” to “stopping sight distance” for consistency with other sections of Part 6 and revisions proposed to typical applications.

Typical Application 10

Note 1 is proposed to be revised to match what is proposed in typical application 27. A revision to note 5 is proposed to modify “sight distance” to “stopping sight distance” for consistency with other sections of Part 6 and revisions proposed to typical applications.

Typical Application 27

Typical application 27 describes flagger control in the notes and shows flagger symbol signs in Figure 6H-27, but the flagger symbol is absent from the figure. The flagger symbol is added to the four intersection approaches for consistency with other typical applications that involve flagger control. These other typical applications include TA-10, TA-13, TA-14, and TA-46.

Section 6E.07, P08 and typical application 10 describe single flagger control for low-volume situations where the flagger is visible to the approaches of each road user. A note, similar to note 1 of typical application 10, is added to typical application 27.

Typical Application 30

Currently in typical application 30, note 1 indicates that the typical application is for “low-speed, low volume urban streets” and that use of the LEFT LANE CLOSED XX FT sign is an option to be used “where speed or volume is higher.” However, multi-lane streets are typically not low volume, and often not low speed.

For consistency with other typical applications involving multi-lane streets and divided highways with lane closures, note 1 is deleted and the LEFT LANE CLOSED AHEAD sign shown on Figure 6H-30. These other typical applications include TA-21, TA-22 (as approved by Council on in June 2014), TA-23, TA-24 (as approved by Council on in June 2014), TA-25 (as approved by Council on in June 2014), TA-33, TA-34, TA-37, TA-38 (as approved by Council on in January 2019), TA-39, TA-42, TA-44, and TA-45. Some states have made these revisions to their state MUTCD.

The task force and TTC technical committee determined that the location of the work vehicle and truck-mounted attenuator shown on Figure 6H-30 should be upstream of the work space instead of next to the work space. In the figure, the work space was widened to encompass both interior lanes with work vehicles and truck-mounted attenuators shown upstream of the work space in the respective lanes.

Arrow boards are shown on Figure 6H-30 as optional with optional buffer spaces downstream of the arrow boards. To correlate with the buffer space principles described in Section 6C.06, P06

71 through P13, the arrow boards have been moved to the opposing interior lanes and behind
72 channelizing devices.

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74 *Typical Application 31*

75 Similar to typical application 30, note 3 of typical application 31 gives an option to use the LEFT
76 LANE CLOSED XX FT where there are “high speeds.” For the same reasons as for typical
77 application 30, note 3 is deleted and a LEFT LANE CLOSED AHEAD sign is added to Figure
78 6H-31.

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80 An arrow board is shown on Figure 6H-31 as optional with an optional buffer space downstream
81 of the arrow board. To correlate with the buffer space principles described in Section 6C.06, P06
82 through P13, a new Standard note has been added to indicate that if an arrow board is used in the
83 closed lane, then the longitudinal space downstream of the arrow board cannot be used as a
84 buffer space.

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86 *Typical Application 35*

87 A revision to note 8 is proposed to modify “sight distance” to “stopping sight distance” for
88 consistency with other sections of Part 6 and revisions proposed to typical applications.

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90 *Typical Application 40 and 44*

91 A revision to note 3 is proposed to modify “sight distance” to “stopping sight distance” for
92 consistency with other sections of Part 6 and revisions proposed to typical applications.

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94 **RECOMMENDED MUTCD CHANGES**

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96 The following present the proposed changes to the current MUTCD within the context of the
97 current MUTCD language. Proposed additions to the MUTCD are shown in blue underline and
98 proposed deletions from the MUTCD are shown in ~~red strikethrough~~. Changes previously
99 approved by NCUTCD Council (but not yet adopted by FHWA) are shown in green double
100 underline for additions and ~~green double strikethrough~~ for deletions. In some cases, background
101 comments may be provided with the MUTCD text. These comments are indicated by [black font
102 in brackets highlighted light blue].

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104 **PART 6. TEMPORARY TRAFFIC CONTROL**

105
106 **CHAPTER 6E. FLAGGER CONTROL**

107
108 **Section 6E.07 Flagger Procedures**

109 [Section 6E.07 has 8 paragraphs. Only the option in paragraph 07 is shown]

110 Option:

111 07 At spot lane closures where adequate stopping sight distance is available for the reasonably
112 safe handling of traffic, the use of one flagger may be sufficient.

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115 CHAPTER 6H. TYPICAL APPLICATIONS

116
117 Section 6H.01 Typical Applications

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119 Notes for Figure 6H-10 – Typical Application 10
120 Lane Closure on a Two-Lane Road Using Flaggers

121 Option:

122 1. Positive protection devices may be used per Section 6F.84a. [Approved by Council
123 01/10/2020]

124 ~~2. For low-volume situations with short work zones on straight roadways where the~~
125 ~~flagger is visible to road users approaching from both directions, a single flagger,~~
126 ~~positioned to be visible to road users approaching from both directions, may be used.~~ A
127 single flagger may be used on straight roadways with low-volumes when road users
128 have stopping sight distance to the flagger on each approach to the flagger station (see
129 Chapter 6E).

130 ~~3.~~ 3. The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for
131 short-duration operations.

132 ~~4.~~ 4. Flashing warning lights and/or flags may be used to call attention to the advance
133 warning signs. A BE PREPARED TO STOP sign may be added to the sign series.

134 Guidance:

135 ~~5.~~ 5. *The buffer space should be extended so that the two-way traffic taper is placed before a*
136 *horizontal (or crest vertical) curve to provide adequate stopping sight distance for the*
137 *flagger and a queue of stopped vehicles.*

138 Standard:

139 ~~6.~~ 6. **At night, flagger stations shall be illuminated, except in emergencies.**

140 Guidance:

141 ~~7.~~ 7. *When used, the BE PREPARED TO STOP sign should be located between the Flagger*
142 *sign and the ONE LANE ROAD sign.*

143 ~~8.~~ 8. *When a grade crossing exists within or upstream of the transition area and it is*
144 *anticipated that queues resulting from the lane closure might extend through the grade*
145 *crossing, the TTC zone should be extended so that the transition area precedes the*
146 *grade crossing.*

147 ~~9.~~ 9. *When a grade crossing equipped with active warning devices exists within the activity*
148 *area, provisions should be made for keeping flaggers informed as to the activation*
149 *status of these warning devices.*

150 ~~10.~~ 10. *When a grade crossing exists within the activity area, drivers operating on the left-hand*
151 *side of the normal center line should be provided with comparable warning devices as*
152 *for drivers operating on the right-hand side of the normal center line.*

153 ~~11.~~ 11. *Early coordination with the railroad company or light rail transit agency should*
154 *occur before work starts.*

155 Option:

156 ~~12.~~ 12. A flagger or a uniformed law enforcement officer may be used at the grade
157 crossing to minimize the probability that vehicles are stopped within 15 feet of the
158 grade crossing, measured from both sides of the outside rails.

160 **Notes for Figure 6H-27 – Typical Application 27**
161 **Closure at the Side of an Intersection**

162 *Guidance:*

- 163 1. *The situation depicted can be simplified by closing one or more of the intersection*
164 *approaches. If this cannot be done, and/or when capacity is a problem, through*
165 *vehicular traffic should be directed to other roads or streets.*
- 166 2. *Depending on road user conditions, flagger(s) or uniformed law enforcement officer(s)*
167 *should be used to direct road users within the intersection.*

168 **Standard:**

- 169 **3. At night, flagger stations shall be illuminated, except in emergencies.**

170 *Option:*

- 171 4. [A single flagger may be used on straight roadways with low-volumes when road users](#)
172 [have stopping sight distance to the flagger on each approach to the flagger station \(see](#)
173 [Chapter 6E\).](#)
- 174 45. Flashing warning lights and/or flags may be used to call attention to the advance
175 warning signs.
- 176 56. For short-duration work operations, the channelizing devices may be eliminated if a
177 vehicle displaying high-intensity rotating, flashing, oscillating, or strobe lights is
178 positioned in the work space.
- 179 67. A BE PREPARED TO STOP sign may be added to the sign series.

180 *Guidance:*

- 181 78. *When used, the BE PREPARED TO STOP sign should be located before the Flagger*
182 *symbol sign.*
- 183 89. *ONE LANE ROAD AHEAD signs should also be used to provide adequate advance*
184 *warning.*

185 *Support:*

- 186 910. Turns can be prohibited as required by vehicular traffic conditions. Unless the streets
187 are wide, it might be physically impossible to make certain turns, especially for large
188 vehicles.

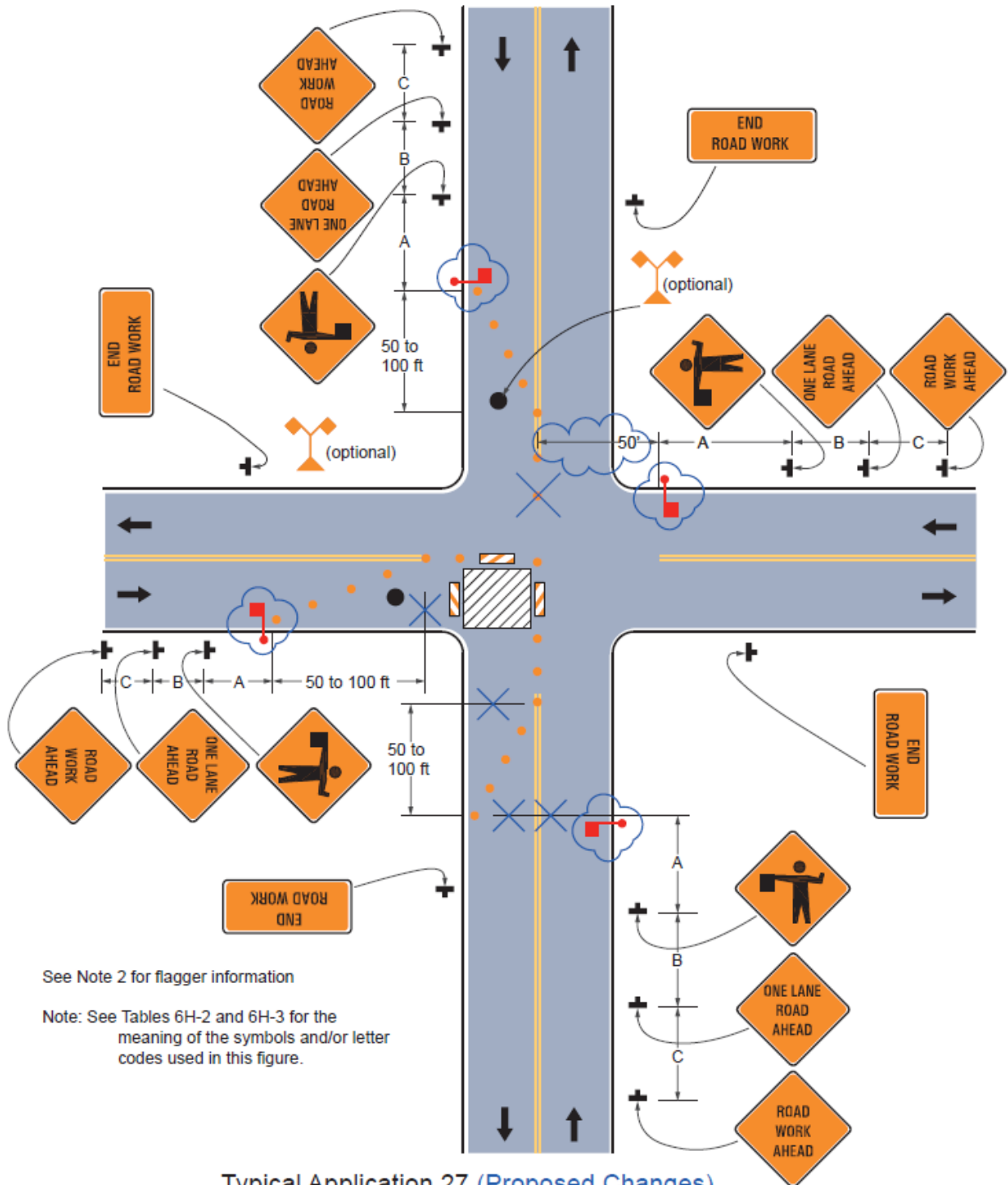
189 *Option:*

- 190 1011. [Positive protection devices may be used per Section 6F.84a. \[Approved by](#)
191 [Council 01/10/2020\]](#)
- 192 1112. Vehicle hazard warning signals may be used to supplement high-intensity
193 rotating, flashing, oscillating, or strobe lights.

194 **Standard:**

- 195 **1213. Vehicle hazard warning signals shall not be used instead of the vehicle's**
196 **high-intensity rotating, flashing, oscillating, or strobe lights.**

Figure 6H-27. Closure at the Side of an Intersection (TA-27)



200 **Notes for Figure 6H-30 – Typical Application 30**
201 **Interior Lane Closure on a Multi-Lane Street**

202 *Guidance:*

203 ~~1. This information applies to low speed, low volume urban streets. Where speed or~~
204 ~~volume is higher, additional signing such as LEFT LANE CLOSED XX FT should be~~
205 ~~used between the signs shown.~~

206 1. The arrow board is shown as optional, but should be used to advise approaching traffic
207 of a lane closure in situations involving heavy traffic volumes, high speeds, and/or
208 limited sight distances, under conditions where road users are less likely to expect such
209 lane closures (see Section 6F.61)

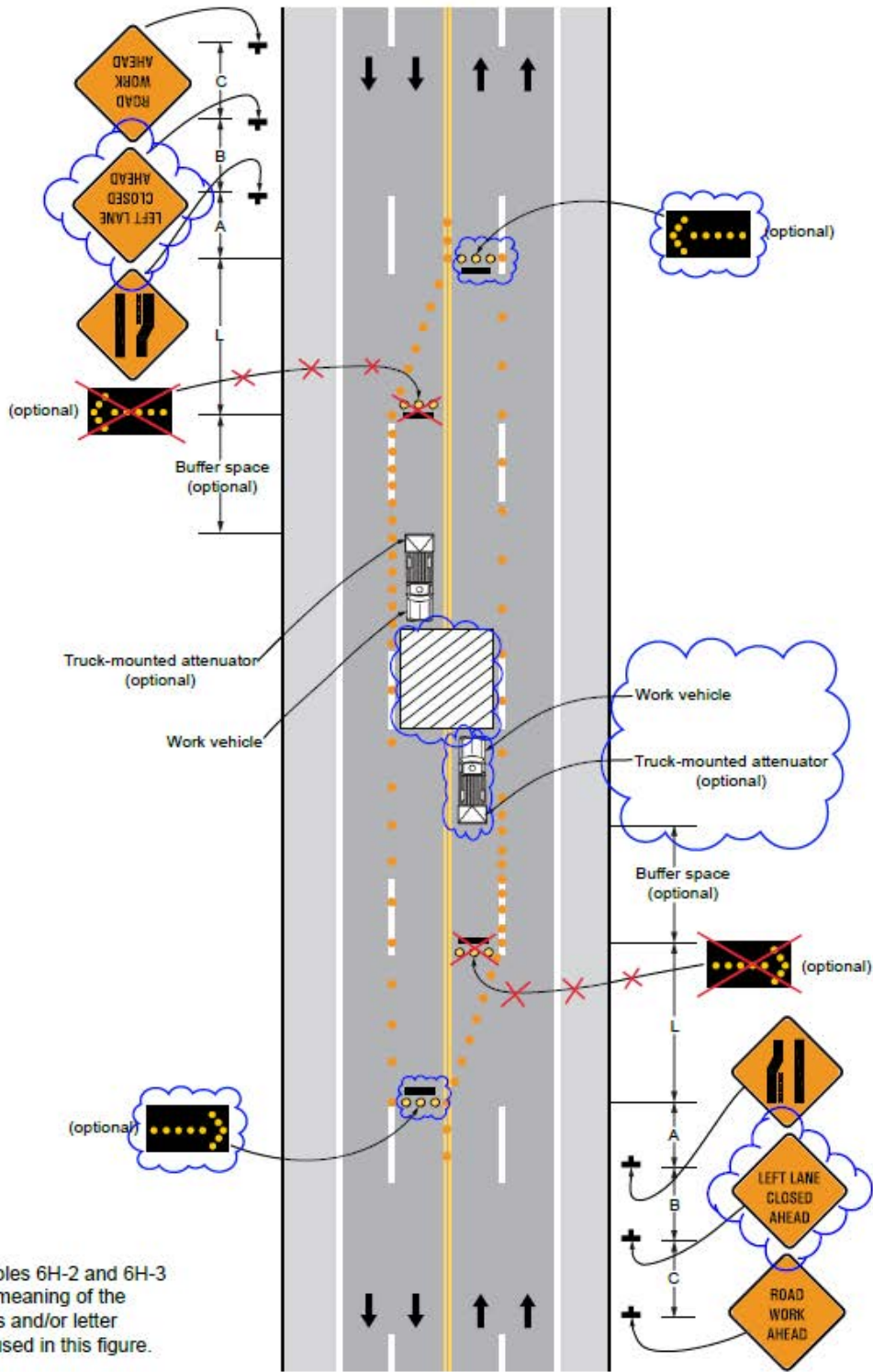
210 Option:

211 2. Additional positive protection devices may be used per Section 6F.84a. [Approved by
212 Council 01/10/2020]

213 3. The closure of the adjacent interior lane in the opposing direction may not be necessary,
214 depending upon the activity being performed and the work space needed for the
215 operation.

216 4. Shadow vehicles with a truck-mounted attenuator may be used.

Figure 6H-30. Interior Lane Closure on a Multi-Lane Street (TA-30)



Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.

Typical Application 30

Notes for Figure 6H-31 – Typical Application 31
Lane Closure on a Street with Uneven Directional Volumes

Standard:

1. The illustrated information shall be used only when the vehicular traffic volume indicates that two lanes of vehicular traffic shall be maintained in the direction of travel for which one lane is closed.
2. If an arrow board is used in the closed lane, the longitudinal distance downstream of the arrow board shall not be used as buffer space.

Option:

- ~~2~~3. The procedure may be used during a peak period of vehicular traffic and then changed to provide two lanes in the other direction for the other peak.

Guidance:

- ~~3~~4. *For high speeds, a LEFT LANE CLOSED XX FT sign should be added for vehicular traffic approaching the lane closure, as shown in Figure 6H-32. The arrow board is shown as optional, but should be used to advise approaching traffic of a lane closure in situations involving heavy traffic volumes, high speeds, and/or limited sight distances, under conditions where road users are less likely to expect such lane closures (see Section 6F.61)*
45. *Conflicting pavement markings should be removed for long-term projects. For short-term and intermediate-term projects where this is not practical, the channelizing devices in the area where the pavement markings conflict should be placed at a maximum spacing of 1/2 S feet where S is the speed in mph. Temporary markings should be installed where needed.*
- ~~5~~6. *If the lane shift has curves with recommended speeds of 30 mph or less, Reverse Turn signs should be used.*
67. *Where the shifted section is long, a Reverse Curve sign should be used to show the initial shift and a second sign should be used to show the return to the normal alignment.*
78. *If the tangent distance along the temporary diversion is less than 600 feet, the Double Reverse Curve sign should be used at the location of the first Two Lane Reverse Curve sign. The second Two Lane Reverse Curve sign should be omitted.*

Standard:

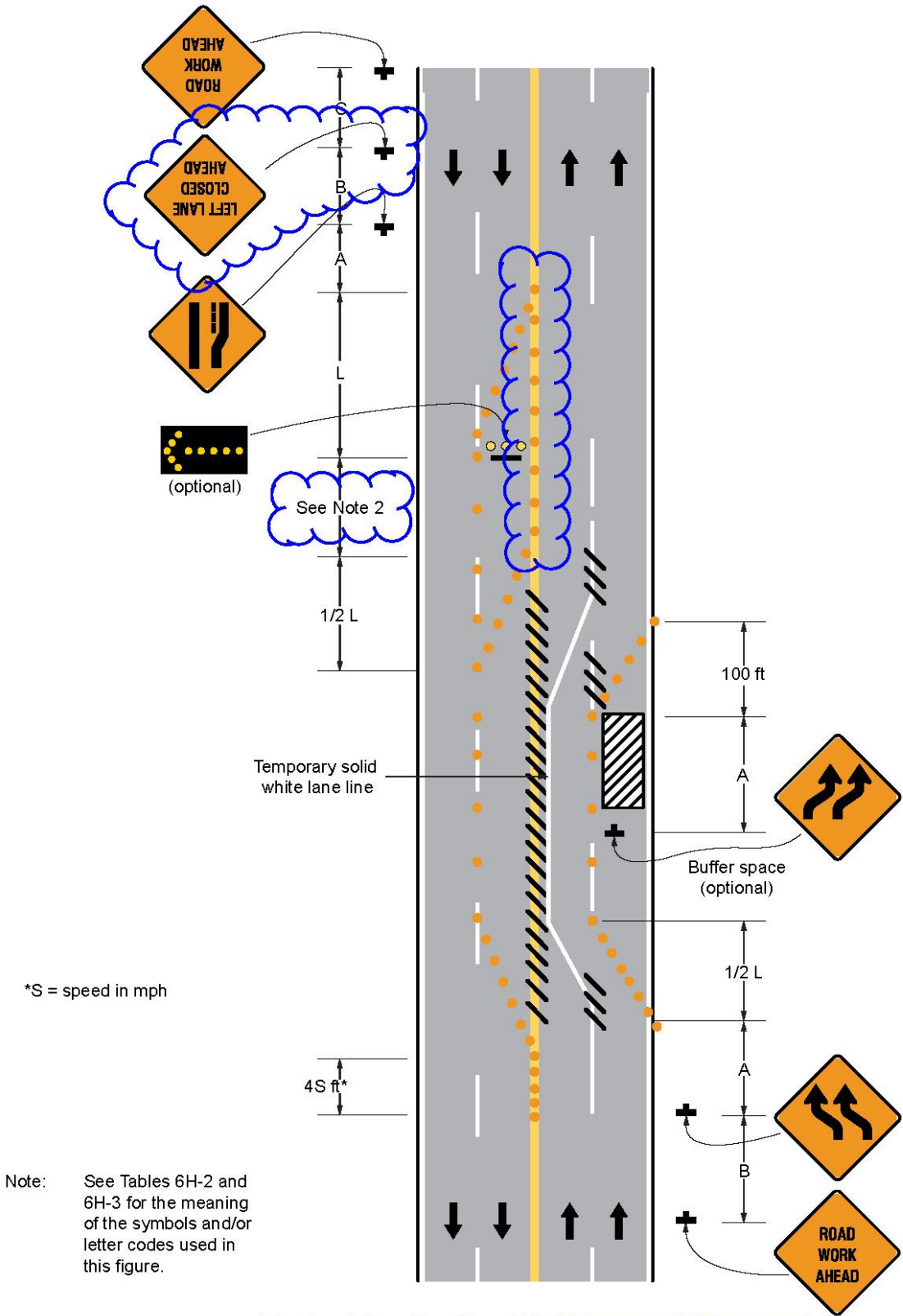
89. The number of lanes illustrated on the Reverse Curve or Double Reverse Curve signs shall be the same as the number of through lanes available to road users, and the direction of the reverse curves shall be appropriately illustrated.

Option:

10. Positive protection devices may be used per Section 6F.84a. [Approved by Council 01/10/2020]
- ~~9~~1011. A longitudinal buffer space may be used in the activity area to separate opposing vehicular traffic.
- ~~10~~1112. Where two or more lanes are being shifted, a W1-4 (or W1-3) sign with an ALL LANES (W24-1cP) plaque (see Figure 6F-4) may be used instead of a sign that illustrates the number of lanes.
- ~~11~~1213. Where more than three lanes are being shifted, the Reverse Curve (or Turn) sign may be rectangular.

263 ~~12~~1314. A work vehicle or a shadow vehicle may be equipped with a truck mounted
264 attenuator.
265

Figure 6H-31. Lane Closures on Street with Uneven Directional Volumes (TA-31)



Typical Application 31 (Proposed Changes)

267 **Notes for Figure 6H-35 – Typical Application 35**
268 **Mobile Operation on a Multi-Lane Road**

269 **Standard:**

- 270 **1. Arrow boards shall, as a minimum, be Type B, with a size of 60 x 30 inches.**
- 271 **2. Vehicle-mounted signs shall be mounted in a manner such that they are not**
272 **obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be**
273 **covered or turned from view when work is not in progress.**
- 274 **3. Shadow and work vehicles shall display high-intensity rotating, flashing,**
275 **oscillating, or strobe lights.**
- 276 **4. An arrow board shall be used when a freeway lane is closed. When more than one**
277 **freeway lane is closed, a separate arrow board shall be used for each closed lane.**

278 *Guidance:*

- 279 *5. Vehicles used for these operations should be made highly visible with appropriate*
280 *equipment, such as flags, signs, or arrow boards.*
- 281 *6. Shadow Vehicle 1 should be equipped with an arrow board and truck-mounted*
282 *attenuator.*
- 283 *7. Shadow Vehicle 2 should be equipped with an arrow board. An appropriate lane*
284 *closure sign should be placed on Shadow Vehicle 2 so as not to obscure the arrow*
285 *board.*
- 286 *8. Shadow Vehicle 2 should travel at a varying distance from the work operation so as to*
287 *provide adequate [stopping](#) sight distance for vehicular traffic approaching from the*
288 *rear.*
- 289 *9. The spacing between the work vehicles and the shadow vehicles, and between each*
290 *shadow vehicle should be minimized to deter road users from driving in between.*
- 291 *10. Work should normally be accomplished during off-peak hours.*
- 292 *11. When the work vehicle occupies an interior lane (a lane other than the far right or far*
293 *left) of a directional roadway having a right-hand shoulder 10 feet or more in width,*
294 *Shadow Vehicle 2 should drive the right-hand shoulder with a sign indicating that work*
295 *is taking place in the interior lane.*

296 *Option:*

- 297 *12. A truck-mounted attenuator may be used on Shadow Vehicle 2.*
- 298 *13. [Additional positive protection devices may be used per Section 6F.84a. \[Approved by](#)*
299 *[Council 01/10/2020\]](#)*
- 300 *14. On high-speed roadways, a third shadow vehicle (not shown) may be used with Shadow*
301 *Vehicle 1 in the closed lane, Shadow Vehicle 2 straddling the edge line, and Shadow*
302 *Vehicle 3 on the shoulder.*
- 303 *15. Where adequate shoulder width is not available, Shadow Vehicle 3 may also straddle*
304 *the edge line.*

306 Notes for Figure 6H-40 – Typical Application 40
307 Median Crossover for an Entrance Ramp

308 *Guidance:*

- 309 1. *The typical application illustrated should be used for carrying an entrance ramp across*
310 *a closed directional roadway of a divided highway.*

311 **Standard:**

- 312 **1a2. Where inadequate acceleration distance exists for the temporary entrance, a STOP**
313 **sign shall be installed. [Approved by Council 01/05/2018]**

314 *Guidance:*

- 315 ~~23.~~ *A temporary acceleration lane should be used to facilitate merging.*
316 ~~34.~~ *When used, the YIELD or STOP sign should be located far enough forward to provide*
317 *adequate stopping sight distance of oncoming mainline vehicular traffic to select an*
318 *acceptable gap, but should not be located so far forward that motorists will be*
319 *encouraged to stop in the path of the mainline traffic. If needed, yield or stop lines*
320 *should be installed across the ramp to indicate the point at which road users should*
321 *yield or stop. Also, a longer acceleration lane should be provided beyond the sign to*
322 *reduce the gap size needed.*
323 ~~3a5.~~ *If sufficient gaps are not available, consideration should be given to closing the ramp.*
324 **[Approved by Council 01/05/2018]**

325 Option:

- 326 ~~46.~~ *Positive protection devices may be used per Section 6F.84a. **[Approved by Council***
327 **01/10/2020]**
- 328 ~~47.~~ *If vehicular traffic conditions allow, the ramp may be closed.*
329 ~~58.~~ *A broken edge line may be carried across the temporary entrance ramp to assist in*
330 *defining the through vehicular traffic lane.*
331 ~~69.~~ *When a temporary traffic barrier is used to separate opposing vehicular traffic, the Two-*
332 *Way Traffic signs and the DO NOT ENTER signs may be eliminated.*
333 ~~6a10.~~ *A Stop Beacon (see Section 4L.05) or a Type B high-intensity warning flasher*
334 *with a red lens may be placed above the STOP sign.*
335 ~~6b11.~~ *Where the acceleration distance is significantly reduced, a supplemental plaque*
336 *may be placed below the Yield Ahead sign reading NO MERGE AREA. **[Approved by***
337 **Council 01/05/2018]**
- 338

339 **Notes for Figure 6H-44 – Typical Application 44**
340 **Work in the Vicinity of an Entrance Ramp**

341 *Guidance:*

- 342 1. *An acceleration lane of sufficient length should be provided whenever possible as*
343 *shown on the left diagram.*

344 **Standard:**

- 345 2. **For the information shown on the diagram on the right-hand side of the typical**
346 **application, where inadequate acceleration distance exists for the temporary**
347 **entrance, a STOP sign shall be installed. ~~the YIELD sign shall be replaced with~~**
348 **~~STOP signs (one on each side of the approach).~~ [Approved by Council 01/05/2018]**

349 *Guidance:*

- 350 3. *When used, the YIELD or STOP sign should be located so that ramp vehicular traffic*
351 *has adequate stopping sight distance of oncoming mainline vehicular traffic to select an*
352 *acceptable gap in the mainline vehicular traffic flow, but should not be located so far*
353 *forward that motorists will be encouraged to stop in the path of the mainline traffic.*
354 *Also, a longer acceleration lane should be provided beyond the sign to reduce the gap*
355 *size needed. If ~~sufficient~~ ~~insufficient~~ gaps are not available, consideration should be*
356 *given to closing the ramp. [Approved by Council 01/05/2018]*
- 357 4. *Where a STOP sign is ~~signs are~~ used, a temporary stop line should be placed across the*
358 *ramp at the desired stop location. [Approved by Council 01/05/2018]*
- 359 5. *The mainline merging taper with the arrow board at its starting point should be located*
360 *sufficiently in advance so that the arrow board is not confusing to drivers on the*
361 *entrance ramp, and so that the mainline merging vehicular traffic from the lane closure*
362 *has the opportunity to stabilize before encountering the vehicular traffic merging from*
363 *the ramp.*
- 364 6. *If the ramp curves sharply to the right, warning signs with advisory speeds located in*
365 *advance of the entrance terminal should be placed in pairs (one on each side of the*
366 *ramp).*

367 *Option:*

- 368 7. *Positive protection devices may be used per Section 6F.84a. [Approved by Council*
369 *01/10/2020]*

370 ~~7~~8. *A Stop Beacon (see Section 4L.05) or a Type B high-intensity warning flasher with a*
371 *red lens may be placed above the STOP sign.*

372 ~~8~~9. *Where the acceleration distance is significantly reduced, a supplemental plaque may be*
373 *placed below the Yield Ahead sign reading NO MERGE AREA.*

374 **Standard:**

- 375 ~~9~~10. **An arrow board shall be used when a freeway lane is closed. When more**
376 **than one freeway lane is closed, a separate arrow board shall be used for each**
377 **closed lane.**