



# National Committee on Uniform Traffic Control Devices

13236 North 7th Street, Suite 4-259, Phoenix, Arizona 85022  
Phone/Text: 231-4-NCUTCD (231-462-8823)  
E-mail: secretary@ncutcd.org Website: <https://ncutcd.org>

Item No.: 24A-TTC-05

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

**COMMITTEE / TASK FORCE:** TTC Technical Committee  
**ITEM NUMBER:** 24A-TTC-05 (Previously Approved 20B-RW-03)  
**TOPIC:** Portable Changeable Message Signs and Arrow Boards  
**ORIGIN OF REQUEST:** Electronic Display Task Force  
**AFFECTED SECTIONS OF MUTCD:** Sections 6L.05 and 6L.06

After publication of the 2023 MUTCD, the NCUTCD rescinded all MUTCD prior recommendations. This proposed change is based on one of those prior recommendations.

### DEVELOPMENT HISTORY:

Previously Approved Recommendation 1/20/2021 (20B-RW-03)  
Approved by NCUTCD Council: MM/DD/YYYY

*This is a proposed change to the MUTCD that are based on a recommendation previously approved by the NCUTCD Council. 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, it 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:

NCUTCD recommended changes to the MUTCD developed by the Electronic Display Traffic Control Task Force was sent to FHWA in January 2021 (20B-RW-03). The changes to Part 6 in the NCUTCD recommendation pertaining to Portable Changeable Message Signs and Arrow Boards were not incorporated into the 11<sup>th</sup> edition of the MUTCD. This proposal resubmits those proposed changes.

### DISCUSSION:

The proposed changes to Sections 6L.05 and 6L.06 eliminate unneeded redundancy with language in Section 2L and elsewhere in the manual. The proposed changes also eliminate language that is no longer relevant for portable changeable message sign and arrow board technologies currently available. Finally, the proposed changes strengthen the requirements for delineating portable changeable message sign and arrow board trailers.

### PROPOSED MUTCD CHANGES:

The following present the proposed changes to the 2023 MUTCD within the context of the 2023 MUTCD language. Proposed additions to the 2023 MUTCD are shown in blue underline and proposed deletions from the 2023 MUTCD are shown in ~~red strikethrough~~. Deletions made by a technical committee or task force after initial distribution to sponsoring organizations are shown

36 in ~~highlighted red strikethrough and Helvetica text~~. Additions made by a technical committee or  
37 task force after initial distribution to sponsoring organizations are shown in underline blue and  
38 Helvetica text.

## 40 PART 6 - TEMPORARY TRAFFIC CONTROL

### 41 CHAPTER 6L. OTHER TTC ZONE TRAFFIC CONTROL DEVICES

#### 42 Section 6L.05 Portable Changeable Message Signs

43 Support:

44 01 Portable changeable message signs (PCMS) are TTC devices installed for temporary use with the  
45 flexibility to display a variety of messages. In most cases, portable changeable message signs follow the  
46 same provisions for design and application as those given for permanent changeable message signs in  
47 Chapter 2L. The information in this Section describes situations where the provisions for portable  
48 changeable message signs differ from those given in Chapter 2L.

49 ~~02 Portable changeable message signs are used most frequently on high density urban freeways, but  
50 have applications on all types of highways where highway alignment, road user routing problems, or  
51 other pertinent conditions require advance warning and information.~~

52 03 Portable changeable message signs have a wide variety of applications in TTC zones including:  
53 roadway, lane, or ramp closures; incident management; width restriction information; speed control or  
54 reductions; advisories on work scheduling; road user management and diversion; warning of adverse  
55 conditions or special events; and other operational control.

56 04 The primary purpose of portable changeable message signs in TTC zones is to advise the road user  
57 of unexpected situations. Portable changeable message signs are particularly useful as they are capable  
58 of:

59 of:  
60 A. Conveying complex messages,  
61 B. Displaying real time information about conditions ahead, and  
62 C. Providing information to assist road users in making decisions prior to the point where actions  
63 must be taken.

64 05 Some typical applications include the following:

- 65 A. Where the speed of vehicular traffic is expected to drop substantially;
- 66 B. Where significant queuing and delays are expected;
- 67 C. Where adverse environmental conditions are present;
- 68 D. Where there are changes in alignment or surface conditions;
- 69 E. Where advance notice of ramp, lane, or roadway closures is needed;
- 70 F. Where crash or incident management is needed; and/or
- 71 G. Where changes in the road user pattern occur.

72 *Guidance:*

73 06 *The components of a portable changeable message sign should include: a message sign, control*  
74 *systems, a power source, and mounting and transporting equipment. The front face of the sign should be*  
75 *covered with a protective material.*

76 **Standard:**

77 07 **Portable changeable message signs shall comply with the applicable design and application**  
78 **principles established in Chapter 2A, Chapter 2L, and other provisions noted for specific signs.**  
79 **Portable changeable message signs shall display only traffic operational, regulatory, warning, and**  
80 **guidance information, and shall not be used for advertising messages.**

81 Support:

82 08 Section 2L.02 contains information regarding overly simplistic or vague messages that is also  
83 applicable to portable changeable message signs.

84 **Standard:**

~~09—The colors used for legends on portable changeable message signs shall comply with those shown in Table 2A-5.~~

~~Support:~~

~~10—Section 2L.04 contains information regarding the luminance, luminance contrast, and contrast orientation that is also applicable to portable changeable message signs.~~

~~Guidance:~~

~~11—Portable changeable message signs should be visible from 1/2 mile under both day and night conditions.~~

~~Support:~~

~~12—Section 2B.21 contains information regarding the design of portable changeable message signs that are used to display speed limits that change based on operational conditions, or are used to display the speed at which approaching drivers are traveling.~~

Option:

12a A portable changeable message sign combined with radar detection may be used to convey the speeds of approaching drivers as a message.

The previous 20B-RW-03 also included an option statement pertaining to portable “hybrid” signs. Since that terminology was not adopted in the 11<sup>th</sup> edition of the MUTCD, that option statement was removed.

~~Guidance:~~

~~13—A portable changeable message sign should be limited to three lines of eight characters per line or should consist of a full matrix display.~~

~~14 Except as provided in Paragraph 15, the letter height used for portable changeable message sign messages should be a minimum of 18 inches comply with provisions in Section 2L.04.~~

~~Option:~~

~~15 For portable changeable message signs mounted on service patrol trucks or other incident response vehicles, a letter height as short as 10 inches may be used. Shorter letter sizes may also be used on a portable changeable message sign used on low speed facilities provided that the message is legible from at least 650 feet.~~

~~16—The portable changeable message sign may vary in size.~~

~~Guidance:~~

~~17—Messages on a portable changeable message sign should consist of no more than two phases, and a phase should consist of no more than three lines of text. Each phase should be capable of being understood by itself, regardless of the order in which it is read. Messages should be centered within each line of legend. If more than one portable changeable message sign is simultaneously legible to road users, then only one of the signs should display a sequential message at any given time.~~

~~Support:~~

~~18—Road users have difficulties in reading messages displayed in more than two phases on a typical three-line portable changeable message sign.~~

~~Standard:~~

~~19—Except when being used to simulate an Arrow Board display (see Section 6L.06), techniques of message display such as animation, rapid flashing, dissolving, exploding, scrolling, travelling horizontally or vertically across the face of the sign, or other dynamic elements shall not be used.~~

~~Guidance:~~

~~20 When a message is divided into two phases, the display time for each phase should be at least 2 seconds, and the sum of the display times for both of the phases should be a maximum of 8 seconds.~~

~~21 All messages should be designed with consideration given to the principles provided in this Section and also taking into account the following:~~

~~A. The message should be as brief as possible and should contain three thoughts (with each thought preferably shown on its own line) that convey:~~

- ~~1. The problem or situation that the road user will encounter ahead,~~
- ~~2. The location of or distance to the problem or situation, and~~
- ~~3. The recommended driver action.~~

136 B. If more than two phases are needed to display a message, additional portable changeable  
137 message signs should be used. When multiple portable changeable message signs are needed, they  
138 should be placed on the same side of the roadway and they should be separated from each other by a  
139 distance of at least 1,000 feet on freeways and expressways, and by a distance of at least 500 feet on  
140 other types of highways.

141 **Standard:**

142 ~~22—When the word messages shown in Tables 1D-1 or 1D-2 need to be abbreviated on a portable~~  
143 ~~changeable message sign, the provisions described in Section 1D.08 shall be followed.~~

144 ~~23—In order to maintain legibility, portable changeable message signs shall automatically adjust~~  
145 ~~their brightness under varying light conditions.~~

146 24 The control system shall include a display screen upon which messages can be reviewed before  
147 being displayed on the message sign. The control system shall be capable of maintaining memory  
148 when power is unavailable.

149 ~~25—Portable changeable message signs shall be equipped with a power source and a battery back-~~  
150 ~~up to provide continuous operation when failure of the primary power source occurs.~~

151 26 The mounting of portable changeable message signs on a trailer, a large truck, or a service  
152 patrol truck shall be such that the bottom of the message sign shall be a minimum of 7 feet above  
153 the roadway in urban areas and 5 feet above the roadway in rural areas when it is in the operating  
154 mode.

155 *Guidance:*

156 27 Portable changeable message signs should be used as a supplement to and not as a substitute for  
157 conventional signs and pavement markings.

158 28 When portable changeable message signs are used for route diversion, they should be placed far  
159 enough in advance of the diversion to allow road users ample opportunity to perform necessary lane  
160 changes, to adjust their speed, or to exit the affected highway.

161 29 Portable changeable message signs should be sited and aligned to provide maximum legibility and  
162 to allow time for road users to respond appropriately to the portable changeable Message sign message.

163 30 Portable changeable message signs should be placed off the shoulder of the roadway and behind a  
164 traffic barrier, if practical. Where a traffic barrier is not available to shield the portable changeable  
165 message sign, it should be placed off the shoulder and outside of the clear zone. If a portable changeable  
166 message sign has to be placed on the shoulder of the roadway or within the clear zone, it should be  
167 delineated with retroreflective TTC devices.

168 31 When portable changeable message signs are used in TTC zones, they should display only TTC  
169 messages.

170 32 When portable changeable message signs are not being used to display TTC messages, they should  
171 be relocated such that they are outside of the clear zone or shielded behind a traffic barrier and turned  
172 away from traffic. If relocation or shielding is not practical, they should be delineated with  
173 retroreflective TTC devices.

174 ~~33—Portable changeable message sign trailers should be delineated on a permanent basis by affixing~~  
175 ~~retroreflective material to, known as conspicuity material, in a continuous line on the face of the trailer~~  
176 ~~as seen by oncoming road users.~~

177 **Standard:**

178 33 Portable changeable message sign trailers shall be delineated on a permanent basis by affixing  
179 a continuous line of retroreflective material to all sides of the trailer.

180 **Section 6L.06 Arrow Boards**

181 **Standard:**

182 01 An arrow board shall be a sign with a matrix of elements capable of either flashing or  
183 sequential displays. This sign shall provide additional warning and directional information to assist  
184 in merging and controlling road users through or around a TTC zone.

185 *Guidance:*

186 02 An arrow board in the arrow or chevron mode should be used to advise approaching traffic of a lane  
 187 closure along major multi-lane roadways in situations involving heavy traffic volumes, high speeds,  
 188 and/or limited sight distances, or at other locations and under other conditions where road users are less  
 189 likely to expect such lane closures.

190 03 If used, an arrow board should be used in combination with appropriate signs, channelizing devices,  
 191 or other TTC devices.

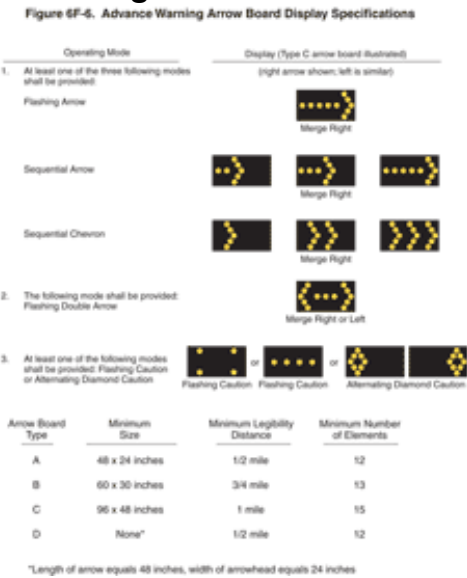
192 04 An arrow board should be placed on the shoulder of the roadway or, if practical, farther from the  
 193 traveled lane. ~~It should be delineated with retroreflective TTC devices.~~ When an arrow board is not  
 194 being used, it should be removed; if not removed, it should be shielded; ~~or if the previous two options are~~  
 195 ~~not feasible, it should be delineated with retroreflective TTC devices.~~

196 **Standard:**

197 04a Arrow Boards shall be delineated on a permanent basis by affixing a continuous line of  
 198 retroreflective material to all sides of the trailer.

199 05 Arrow boards shall meet the minimum size, legibility distance, number of elements, and other  
 200 specifications shown in Figure 6L-3.

201 **Figure 6L-3 Advance Warning Arrow Board Display Specifications**



202 **Support:**

203 06 Type A arrow boards are appropriate for use on low-speed urban streets. Type B arrow boards are  
 204 appropriate for intermediate-speed facilities and for maintenance or mobile operations on high-speed  
 205 roadways. Type C arrow boards are intended to be used on high-speed, high-volume motor vehicle traffic  
 206 control projects. Type D arrow boards are intended for use on vehicles authorized by the State or local  
 207 agency.

208 **Standard:**

209 07 Type A, B, and C arrow boards shall have solid rectangular appearances. A Type D arrow  
 210 board shall conform to the shape of the arrow.

211 08 All arrow boards shall be finished in non-reflective black. The arrow board shall be mounted  
 212 on a vehicle, a trailer, or other suitable support.

213 **Guidance:**

214 09 The minimum mounting height, measured vertically from the bottom of the board to the roadway  
 215 below it or to the elevation of the near edge of the roadway, of an arrow board should be 7 feet, except  
 216 on vehicle-mounted arrow boards, which should be as high as practical.

217 10 A vehicle-mounted arrow board should be provided with remote controls.

218 **Standard:**

219 11 **Arrow board elements shall be capable of at least a 50 percent dimming from full brilliance.**  
220 **The dimmed mode shall be used for nighttime operation of arrow boards.**  
221 *Guidance:*  
222 12 *Full brilliance should be used for daytime operation of arrow boards.*  
223  
224 **Standard:**  
225 13 **The arrow board shall have suitable elements capable of the various operating modes. The**  
226 **color presented by the elements shall be yellow.**  
227 *Guidance:*  
228 14 *If an arrow board consisting of a bulb matrix is used, the elements should be recess-mounted or*  
229 *equipped with an upper hood of not less than 180 degrees.*  
230 **Standard:**  
231 15 **The minimum element on-time shall be 50 percent for the flashing mode, with equal intervals**  
232 **of 25 percent for each sequential phase. The flashing rate shall be not less than 25 or more than 40**  
233 **flashes per minute.**  
234 16 **An arrow board shall have the following three mode selections:**  
235 **A. A Flashing Arrow, Sequential Arrow, or Sequential Chevron mode;**  
236 **B. A flashing Double Arrow mode; and**  
237 **C. A flashing Caution or Alternating Diamond mode.**  
238 17 **An arrow board in the arrow or chevron mode shall be used only for stationary or moving lane**  
239 **closures on multi-lane roadways.**  
240 18 **For shoulder work, blocking the shoulder, for roadside work near the shoulder, or for**  
241 **temporarily closing one lane on a two-lane, two-way roadway, an arrow board shall be used only in**  
242 **the caution mode.**  
243 *Guidance:*  
244 19 *For a stationary lane closure, the arrow board should be located on the shoulder at the beginning of*  
245 *the merging taper.*  
246 20 *Where the shoulder is narrow, the arrow board should be located in the closed lane.*  
247 **Standard:**  
248 21 **When arrow boards are used to close multiple lanes, a separate arrow board shall be used for**  
249 **each closed lane.**  
250 *Guidance:*  
251 22 *When arrow boards are used to close multiple lanes, if the first arrow board is placed on the*  
252 *shoulder, the second arrow board should be placed in the first closed lane at the upstream end of the*  
253 *second merging taper (see Figure 6P-37). When the first arrow board is placed in the first closed lane,*  
254 *the second arrow board should be placed in the second closed lane at the downstream end of the second*  
255 *merging taper.*  
256 23 *For mobile operations where a lane is closed, the arrow board should be located to provide*  
257 *adequate separation from the work operation to allow for appropriate reaction by approaching drivers.*  
258 **Standard:**  
259 24 **A vehicle displaying an arrow board shall be equipped with high-intensity rotating, flashing,**  
260 **oscillating, or strobe lights.**  
261 25 **Arrow boards shall only be used to indicate a lane closure. Arrow boards shall not be used to**  
262 **indicate a lane shift.**  
263 *Option:*  
264 26 *A portable changeable message sign may be used to simulate an arrow board display.*