



National Committee on Uniform Traffic Control Devices

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National Committee on Uniform Traffic Control Devices (NCUTCD) Recommended Changes to Proposed Text for 11th Edition of the MUTCD Docket Number: FHWA-2020-0001

Federal Register Item Number: 382, 384, 385 (see listing below)

NPA MUTCD Section Number: Chapter 4A

Legend: Base text shown in proposal is the NPA “clean” proposed text.

- [NCUTCD recommendation for text to be added in final rule.](#)
- ~~NCUTCD recommendation for text to be deleted in final rule.~~
- [NCUTCD recommendation for text to be moved/relocated in final rule.](#)
- NPA text that was not previously approved by NCUTCD but is now approved.
- Explanatory note: [\[Note that explains purpose of recommended change.\]](#)

The following pages present NCUTCD recommendations for changes to the MUTCD NPA proposed text, tables, and figures for Chapter 4A. Below is a short summary of the NCUTCD position for each section of this chapter. A more detailed summary is provided at the beginning of each section.

- NPA #382, Section 4A.01: NCUTCD agrees with NPA content.
- NPA #386, Section 4A.02: NCUTCD agrees with NPA content.
- NPA #N/A, Section 4A.03: NCUTCD agrees with NPA content.
- NPA #N/A, Section 4A.04: NCUTCD agrees with NPA content.
- NPA #384, Section 4A.05: Changes recommended based on Council action in spring 2021.
- NPA #N/A, Section 4A.06: NCUTCD agrees with NPA content.
- NPA #N/A, Section 4A.07: NCUTCD agrees with NPA content.
- NPA #385 Section 4A.08: NCUTCD agrees with NPA content.
- NPA #N/A, Section 4A.09: NCUTCD agrees with NPA content.
- NPA #N/A, Section 4A.10: NCUTCD agrees with NPA content with the addition of one word as shown in Guidance.

Section 4A.01 Comments: NCUTCD agrees with 4A.01 as presented in the NPA.

Section 4A.01 Types

Support:

The following types and uses of highway traffic signals are discussed in Part 4: traffic control signals; bicycle signal faces; pedestrian signal heads; hybrid beacons; rectangular rapid flashing beacons; emergency-vehicle traffic control signals; traffic control signals for one-lane, two-way facilities; traffic control signals for freeway entrance ramps; movable bridge traffic signals; toll plaza traffic signals; flashing beacons; lane-use control signals; and in-roadway warning lights.

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Section 4A.02 Comments: NCUTCD agrees with 4A.02 as presented in the NPA.

Section 4A.02 Meanings of Signal Indications

Support:

The “Uniform Vehicle Code” (see Section 1A.11) is the primary source for the standards for the meanings of vehicular signal indications to both vehicle operators and pedestrians as provided in Sections 4A.04 and 4A.05, and the standards for the meanings of separate pedestrian signal head indications as provided in Section 4A.06.

The physical area that is defined as being “within the intersection” is dependent upon the conditions that are described in the definition of intersection in Section 1C.02.

Section 4A.03 Comments: NCUTCD agrees with 4A.03 as presented in the NPA.

Section 4A.03 Meanings of Steady Vehicular Signal Indications

Standard:

The following meanings shall be given to steady highway traffic signal indications for vehicles and pedestrians:

A. Steady green signal indications shall have the following meanings:

- 1. Vehicular traffic facing a CIRCULAR GREEN signal indication is permitted to proceed straight through or turn right or left or make a U-turn movement except as such movement is modified by lane-use signs, turn prohibition signs, lane markings, roadway design, separate turn signal indications, or other traffic control devices.**

Such vehicular traffic, including vehicles turning right or left or making a U-turn movement, shall yield the right-of-way to:

- (a) Pedestrians lawfully within an associated crosswalk, and**
- (b) Other vehicles lawfully within the intersection.**

In addition, vehicular traffic turning left or making a U-turn movement to the left shall yield the right-of-way to other vehicles approaching from the opposite direction so closely as to constitute an immediate hazard during the time when such turning vehicle is moving across or within the intersection.

- 2. Vehicular traffic facing a GREEN ARROW signal indication, displayed alone or in combination with another signal indication, is permitted to cautiously enter the intersection only to make the movement indicated by such arrow, or such other movement as is permitted by other signal indications displayed at the same time.**

Such vehicular traffic, including vehicles turning right or left or making a U-turn movement, shall yield the right-of-way to:

- (a) Pedestrians lawfully within an associated crosswalk, and**
- (b) Other vehicles lawfully within the intersection.**

- 3. Pedestrians facing a CIRCULAR GREEN signal indication, unless otherwise directed by a pedestrian signal indication or other traffic control device, are permitted to proceed across the roadway within any marked or unmarked associated crosswalk. The pedestrian shall yield the right-of-way to vehicles**

86 lawfully within the intersection or so close as to create an immediate hazard at
87 the time that the green signal indication is first displayed.

- 88 4. Pedestrians facing a GREEN ARROW signal indication, unless otherwise
89 directed by a pedestrian signal indication or other traffic control device, shall
90 not cross the roadway.

91 **B. Steady yellow signal indications shall have the following meanings:**

- 92 1. Vehicular traffic facing a steady CIRCULAR YELLOW signal indication is
93 thereby warned that the related green movement or the related flashing arrow
94 movement is being terminated or that a steady red signal indication will be
95 displayed immediately thereafter when vehicular traffic shall not enter the
96 intersection. The rules set forth concerning vehicular operation under the
97 movement(s) being terminated shall continue to apply while the steady
98 CIRCULAR YELLOW signal indication is displayed.
- 99 2. Vehicular traffic facing a steady YELLOW ARROW signal indication is thereby
100 warned that the related GREEN ARROW movement or the related flashing
101 arrow movement is being terminated. The rules set forth concerning vehicular
102 operation under the movement(s) being terminated shall continue to apply while
103 the steady YELLOW ARROW signal indication is displayed.
- 104 3. Pedestrians facing a steady CIRCULAR YELLOW or YELLOW ARROW
105 signal indication, unless otherwise directed by a pedestrian signal indication or
106 other traffic control device shall not start to cross the roadway.

107 **C. Steady red signal indications shall have the following meanings:**

- 108 1. Vehicular traffic facing a steady CIRCULAR RED signal indication, unless
109 entering the intersection to make another movement permitted by another signal
110 indication, shall stop at a clearly marked stop line; but if there is no stop line,
111 traffic shall stop before entering the crosswalk on the near side of the
112 intersection; or if there is no crosswalk, then before entering the intersection;
113 and shall remain stopped until a signal indication to proceed is displayed, or as
114 provided below.

115 Except when a traffic control device is in place prohibiting a turn on red or a
116 steady RED ARROW signal indication is displayed, vehicular traffic facing a
117 steady CIRCULAR RED signal indication is permitted to enter the intersection
118 to turn right, or to turn left from a one-way street into a one-way street, after
119 stopping. The right to proceed with the turn shall be subject to the rules
120 applicable after making a stop at a STOP sign.

- 121 2. Vehicular traffic facing a steady RED ARROW signal indication shall not enter
122 the intersection to make the movement indicated by the arrow and, unless
123 entering the intersection to make another movement permitted by another signal
124 indication, shall stop at a clearly marked stop line; but if there is no stop line,
125 before entering the crosswalk on the near side of the intersection; or if there is
126 no crosswalk, then before entering the intersection; and shall remain stopped
127 until a signal indication or other traffic control device permitting the movement
128 indicated by such RED ARROW is displayed.

129 When a traffic control device is in place permitting a turn on a steady RED
130 ARROW signal indication, vehicular traffic facing a steady RED ARROW
131 signal indication is permitted to enter the intersection to make the movement

- 132 indicated by the arrow signal indication, after stopping. The right to proceed
133 with the turn shall be limited to the direction indicated by the arrow and shall be
134 subject to the rules applicable after making a stop at a STOP sign.
135 3. Unless otherwise directed by a pedestrian signal indication or other traffic
136 control device, pedestrians facing a steady CIRCULAR RED or steady RED
137 ARROW signal indication shall not enter the roadway.
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140 **Section 4A.04 Comments: NCUTCD agrees with 4A.04 as presented in the NPA.**

141 **Section 4A.04 Meanings of Flashing Vehicular Signal Indications**

142 **Standard:**

143 The following meanings shall be given to flashing highway traffic signal indications for
144 vehicles and pedestrians:

- 145 A. A flashing green signal indication has no meaning and shall not be used.
146 B. Flashing yellow signal indications shall have the following meanings:
147 1. Vehicular traffic, on an approach to an intersection, facing a flashing
148 CIRCULAR YELLOW signal indication is permitted to cautiously enter the
149 intersection to proceed straight through or turn right or left or make a U-turn
150 except as such movement is modified by lane-use signs, turn prohibition signs,
151 lane markings, roadway design, separate turn signal indications, or other traffic
152 control devices.

153 Such vehicular traffic, including vehicles turning right or left or making a U-
154 turn, shall yield the right-of-way to:

- 155 (a) Pedestrians lawfully within an associated crosswalk, and
156 (b) Other vehicles lawfully within the intersection.

157 In addition, vehicular traffic turning left or making a U-turn to the left shall
158 yield the right-of-way to other vehicles approaching from the opposite direction
159 so closely as to constitute an immediate hazard during the time when such
160 turning vehicle is moving across or within the intersection.

- 161 2. Vehicular traffic, on an approach to an intersection, facing a flashing YELLOW
162 ARROW signal indication, displayed alone or in combination with another
163 signal indication, is permitted to cautiously enter the intersection only to make
164 the movement indicated by such arrow, or other such movement as is permitted
165 by other signal indications displayed at the same time.

166 Such vehicular traffic, including vehicles turning right or left or making a U-
167 turn, shall yield the right-of-way to:

- 168 (a) Pedestrians lawfully within an associated crosswalk, and
169 (b) Other vehicles lawfully within the intersection.

170 In addition, vehicular traffic turning left or making a U-turn to the left shall
171 yield the right-of-way to other vehicles approaching from the opposite direction
172 so closely as to constitute an immediate hazard during the time when such
173 turning vehicle is moving across or within the intersection.

- 174 3. Pedestrians facing any flashing yellow signal indication at an intersection, unless
175 otherwise directed by a pedestrian signal indication or other traffic control
176 device, are permitted to proceed across the roadway within any marked or
177 unmarked associated crosswalk. Pedestrians shall yield the right-of-way to

178 vehicles lawfully within the intersection at the time that the flashing yellow
179 signal indication is first displayed.

180 4. When a flashing CIRCULAR YELLOW signal indication(s) is displayed as a
181 beacon (see Chapter 4S) to supplement another traffic control device, road users
182 are notified that there is a need to pay extra attention to the message contained
183 thereon or that the regulatory or warning requirements of the other traffic
184 control device, which might not be applicable at all times, are currently
185 applicable.

186 C. Flashing red signal indications shall have the following meanings:

187 1. Vehicular traffic, on an approach to an intersection, facing a flashing
188 CIRCULAR RED signal indication shall stop at a clearly marked stop line; but
189 if there is no stop line, before entering the crosswalk on the near side of the
190 intersection; or if there is no crosswalk, at the point nearest the intersecting
191 roadway where the driver has a view of approaching traffic on the intersecting
192 roadway before entering the intersection. The right to proceed shall be subject
193 to the rules applicable after making a stop at a STOP sign.

194 2. Vehicular traffic, on an approach to an intersection, facing a flashing RED
195 ARROW signal indication if intending to turn in the direction indicated by the
196 arrow shall stop at a clearly marked stop line; but if there is no stop line, before
197 entering the crosswalk on the near side of the intersection; or if there is no
198 crosswalk, at the point nearest the intersecting roadway where the driver has a
199 view of approaching traffic on the intersecting roadway before entering the
200 intersection. The right to proceed with the turn shall be limited to the direction
201 indicated by the arrow and shall be subject to the rules applicable after making
202 a stop at a STOP sign.

203 3. Pedestrians facing any flashing red signal indication at an intersection, unless
204 otherwise directed by a pedestrian signal indication or other traffic control
205 device, are permitted to proceed across the roadway within any marked or
206 unmarked associated crosswalk. Pedestrians shall yield the right-of-way to
207 vehicles lawfully within the intersection at the time that the flashing red signal
208 indication is first displayed.

209 4. When a flashing CIRCULAR RED signal indication(s) is displayed as a beacon
210 (see Chapter 4S) to supplement another traffic control device, road users are
211 notified that there is a need to pay extra attention to the message contained
212 thereon or that the regulatory requirements of the other traffic control device,
213 which might not be applicable at all times, are currently applicable. Use of this
214 signal indication shall be limited to supplementing STOP (R1-1), DO NOT
215 ENTER (R5-1), or WRONG WAY (R5-1a) signs, and to applications where
216 compliance with the supplemented traffic control device requires a stop at a
217 designated point.

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220 **Section 4A.05 Comments:** NCUTCD recommends revisions to various paragraphs to more
221 closely parallel the meanings of CIRCULAR GREEN, CIRCULAR YELLOW, and
222 CIRCULAR RED in Sections 4A.03 and 4A.04, add text to indicate that the bicycle signal
223 indications only apply to bicyclists in a bicycle lane or separate facility and to add the meaning
224 of a GREEN ARROW when used in a bicycle signal face.

226 Section 4A.05 Meanings of Bicycle Symbol Signal Indications

227 Standard:

228 The following meanings shall be given to bicycle traffic signal indications for bicyclists
229 and shall only be applicable to bicyclists in a designated bicycle lane or a separate facility,
230 such as a shared use path: (add text to note that these meanings of these indications only apply
231 to bicyclists in a bicycle lane or separate facility)

- 232 A. Bicyclists facing a steady GREEN BICYCLE signal indication are permitted ~~to~~
233 ~~cautiously enter the intersection~~ to make any movement that is lawful and practical
234 and in compliance with any lane-use signs, turn prohibition signs, lane markings,
235 roadway design, separate turn signal indications, or other traffic control devices.
236 Where a Bicycle Signal (R10-40, R10-40a, R10-41, R10-41a, R10-41b, R10-41c) sign
237 (see Section 9B.22) is located immediately adjacent to the signal face, as discussed in
238 Section 4H.04, bicyclists are permitted only to make the movements indicated by the
239 lane-use arrows displayed on the ~~Bicycle Signal sign (see Section 9B.22) that is~~
240 ~~located immediately adjacent to the signal face.~~ Bicyclists proceeding into the
241 intersection during the display of the steady GREEN BICYCLE signal indication
242 shall yield the right-of-way to pedestrians lawfully within an associated crosswalk,
243 and to other vehicles lawfully within the intersection. In addition, bicyclists turning
244 across other movements shall yield the right-of-way so they do not constitute an
245 immediate hazard to those movements during the time when the turning bicyclists
246 are moving within an intersection. (modify to more closely parallel the meaning of
247 CIRCULAR GREEN indication in Section 4A.03)
- 248 B. Bicyclists facing a steady YELLOW BICYCLE signal indication are thereby
249 warned that the related ~~green movement~~ GREEN BICYCLE indication or flashing
250 YELLOW BICYCLE indication is being terminated and that a steady RED
251 BICYCLE signal indication will be displayed immediately thereafter when bicyclists
252 shall not enter the intersection. The rules set forth concerning bicycle operation
253 under the movement being terminated shall continue to apply while the steady
254 YELLOW BICYCLE signal indication is displayed. (modify to more closely parallel
255 the meaning of steady CIRCULAR YELLOW indication in Section 4A.03)
- 256 C. Bicyclists facing a steady RED BICYCLE signal indication ~~shall not enter the~~
257 ~~intersection to make the movement indicated by the lane-use arrow(s) displayed on~~
258 ~~the Bicycle Signal (RX-XX) sign that is located immediately adjacent to the signal~~
259 ~~face and,~~ unless entering the intersection to make another movement permitted by
260 another bicycle symbol signal indication, shall stop at a clearly marked stop line;
261 but if there is no stop line, before entering the crosswalk on the near side of the
262 intersection; or if there is no crosswalk, then before entering the intersection; and
263 shall remain stopped until a GREEN BICYCLE or flashing YELLOW BICYCLE
264 signal indication ~~permitting the movement indicated by such RED BICYCLE signal~~

265 ~~indication~~ is displayed. (add “or flashing YELLOW BICYCLE” as shown, in
266 conjunction with recommended changes in Chapter 4H)

267 Except when a traffic control device is in place prohibiting a turn on red,
268 bicyclists facing a steady RED BICYCLE signal indication are permitted to enter
269 the intersection to turn right if there are no approach lanes for motor vehicle traffic
270 to their right, or to turn left from a one-way street into a one-way street if there are
271 no approach lanes for motor vehicle traffic to their left, after stopping. The right to
272 proceed with the turn shall be subject to the rules applicable after making a stop at
273 a STOP sign. (modify to more closely parallel the meaning of steady CIRCULAR
274 YELLOW indication in Section 4A.03)

275 D. A flashing GREEN BICYCLE signal indication has no meaning and shall not be
276 used.

277 E. Bicyclists facing a flashing YELLOW BICYCLE signal indication are permitted to
278 cautiously enter the intersection to proceed straight through or turn right or left or
279 make a U-turn except as such movement is modified by lane-use signs, turn
280 prohibition signs, lane markings, roadway design, separate turn signal indications,
281 or other traffic control devices. Where a Bicycle Signal (R10-40, R10-40a, R10-41,
282 R10-41a, R10-41b, R10-41c) sign (see Section 9B.22) is located immediately adjacent
283 to the signal face, as discussed in Section 4H.04, bicyclists are permitted only to
284 make the movements indicated by the lane-use arrows displayed on the ~~Bicycle~~
285 ~~Signal sign (see Section 9B.22) that is located immediately adjacent to the signal~~
286 ~~face~~. Bicyclists proceeding into the intersection during the display of the flashing
287 YELLOW BICYCLE signal indication shall yield the right-of-way to pedestrians
288 lawfully within an associated crosswalk, and to other vehicles lawfully within the
289 intersection unless the other vehicles making permissive movements are required to
290 yield to the bicycle traffic.

291 In addition, bicyclists turning across other movements shall yield the right-of-
292 way so they do not constitute an immediate hazard to those movements during the
293 time when the turning bicyclists are moving within an intersection. (modify to more
294 closely parallel the meaning of flashing CIRCULAR YELLOW indication in Section
295 4A.04)

296 F. Bicyclists facing a flashing RED BICYCLE signal indication shall stop at a clearly
297 marked stop line; but if there is no stop line, before entering the crosswalk on the
298 near side of the intersection; or if there is no crosswalk, at the point nearest the
299 intersecting roadway where the bicyclist has a view of approaching traffic on the
300 intersecting roadway before entering the intersection. The right to proceed ~~in the~~
301 ~~direction indicated by the lane-use arrow(s) displayed on the Bicycle Signal (RX-~~
302 ~~XX) sign that is located immediately adjacent to the signal face~~ shall be subject to
303 the rules applicable after making a stop at a STOP sign.

304 G. Bicyclists facing a GREEN ARROW signal indication, displayed in combination
305 with a GREEN BICYCLE symbol indication in the same signal face, are permitted
306 to enter the intersection only to make the movement indicated by such arrow, or
307 such other movement as is permitted by the GREEN BICYCLE symbol indication
308 in the same signal face displayed at the same time. Such bicycle traffic, including
309 bicyclists turning right or left, shall yield the right-of-way to pedestrians lawfully
310 within an associated crosswalk and to other vehicles lawfully within the intersection.

311 NCUTCD recommends adding a definition G, based on definition 4A.03 A 2 for a
312 GREEN ARROW, but modifying it to apply in a bicycle signal face, for the use of a
313 steady GREEN ARROW in a bicycle signal face.
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316 **Section 4A.06 Comments:** NCUTCD agrees with 4A.06 as presented in the NPA.

317 **Section 4A.06 Meanings of Pedestrian Signal Indications**

318 **Standard:**

319 **Pedestrian signal indications shall have the following meanings:**

- 320 **A. A flashing WALKING PERSON (symbolizing WALK) signal indication has no**
321 **meaning and shall not be used.**
- 322 **B. Pedestrians facing a steady WALKING PERSON (symbolizing WALK) signal**
323 **indication shall be permitted to start to cross the roadway in the direction of the**
324 **signal indication, possibly in conflict with turning vehicles. Pedestrians shall yield**
325 **the right-of-way to vehicles lawfully within the intersection at the time that the**
326 **WALKING PERSON (symbolizing WALK) signal indication is first shown.**
- 327 **C. Pedestrians facing a flashing UPRAISED HAND (symbolizing DONT WALK)**
328 **signal indication shall not start to cross the roadway in the direction of the signal**
329 **indication. Any pedestrian who has already started to cross the roadway on a steady**
330 **WALKING PERSON (symbolizing WALK) signal indication shall continue to**
331 **proceed to the far side of the traveled way of the street or highway, unless otherwise**
332 **directed by a traffic control device to proceed only to the median of a divided**
333 **highway or only to a safety island.**
- 334 **D. Pedestrians facing a steady UPRAISED HAND (symbolizing DONT WALK) signal**
335 **indication shall not enter the roadway in the direction of the signal indication.**
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338 **Section 4A.07 Comments:** NCUTCD agrees with 4A.07 as presented in the NPA.

339 **Section 4A.07 Lateral Offset of Signal Supports and Cabinets**

340 *Guidance:*

341 *The following items should be considered when placing signal supports and cabinets:*

- 342 *A. Reference should be made to the American Association of State Highway and*
343 *Transportation Officials (AASHTO) "Roadside Design Guide" (see Section 1A.11) and*
344 *to the U.S. Department of Justice 2010 ADA Standards for Accessible Design, September*
345 *15, 2010 and Code of Federal Regulations, Title 28, Parts 35 and 36. Americans with*
346 *Disabilities Act of 1990 (see Section 1A.11).*
- 347 *B. Signal supports should be placed as far as practical from the edge of the traveled way*
348 *without adversely affecting the visibility of the signal indications.*
- 349 *C. Where supports cannot be located based on the recommended AASHTO clearances,*
350 *consideration should be given to the use of appropriate safety devices.*
- 351 *D. No part of a concrete base for a signal support should extend more than 4 inches above*
352 *the ground level at any point. This limitation does not apply to the concrete base for a*
353 *rigid support.*
- 354 *E. In order to minimize hindrance to the passage of persons with physical disabilities, a*
355 *signal support or controller cabinet should not obstruct the sidewalk, or access from the*
356 *sidewalk to the crosswalk.*

- 357 F. Controller cabinets should be located as far as practical from the edge of the roadway.
358 G. On medians, the minimum clearances provided in Items A through E for signal supports
359 should be obtained if practical.
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362 **Section 4A.08 Comments: NCUTCD agrees with 4A.08 as presented in the NPA.**

363 **Section 4A.08 Use of Signs at Signalized Locations**

364 Support:

365 Traffic signal signs are sometimes used at highway traffic signal locations to instruct or guide
366 pedestrians, bicyclists, or motorists. Among the signs typically used at or on the approaches to
367 signalized locations are movement prohibition signs (see Section 2B.26), lane control signs (see
368 Sections 2B.27 to 2B.29), pedestrian crossing signs (see Section 2B.58), pedestrian actuation
369 signs (see Section 2B.59), traffic signal signs (see Sections 2B.60 and 2C.44), Signal Ahead
370 warning signs (see Section 2C.36), Street Name signs (see Section 2D.45), and Advance Street
371 Name signs (see Section 2D.46).

372 *Guidance:*

373 *Regulatory, warning, and guide signs should be used at highway traffic signal locations as*
374 *provided in Part 2 and as specifically provided elsewhere in Part 4.*

375 Support:

376 Section 2B.27 contains information regarding the use of overhead lane control signs on
377 signalized approaches where lane drops, multiple-lane turns involving combined through-and-
378 turn lanes, or other lane-use regulations that would be unexpected by unfamiliar road users are
379 present.

380 *Guidance:*

381 *If used, illuminated traffic signal signs should be designed and mounted in such a manner as*
382 *to avoid glare and reflections that seriously detract from the signal indications. Highway traffic*
383 *signal faces should be given dominant position and brightness to maximize their priority in the*
384 *overall display.*

385 **Standard:**

386 **The minimum vertical clearance and horizontal offset of the total assembly of traffic**
387 **signal signs (see Section 2B.60) shall comply with the provisions of Sections 4D.08 and**
388 **4D.09.**

389 **STOP signs shall not be used in conjunction with any highway traffic signal operation,**
390 **except in either of the following cases:**

- 391 **A. If the signal indication for an approach is a flashing red at all times, or**
392 **B. If a minor street or driveway is located within or adjacent to an area controlled by a**
393 **traffic control signal, but does not require separate traffic signal control because an**
394 **extremely low potential for conflict exists.**
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397 **Section 4A.09 Comments: NCUTCD agrees with 4A.09 as presented in the NPA.**

398 **Section 4A.09 Use of Pavement Markings at Signalized Locations**

399 Support:

400 Pavement markings that clearly communicate the operational plan of an intersection to road
401 users play an important role in the effective operation of highway traffic signals. By designating
402 the number of lanes, the use of each lane, the length of additional lanes on the approach to an

403 intersection, and the proper stopping points, the engineer can design the signal phasing and
404 timing to best match the goals of the operational plan.

405 *Guidance:*

406 *Pavement markings should be used at highway traffic signal locations as provided in Part 3.*
407 *If the road surface will not retain pavement markings, signs should be installed to provide the*
408 *needed road user information.*

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411 **Section 4A.10 Comments:** NCUTCD agrees with 4A.10 as presented in the NPA with very
412 **minor editorial changes.**

413 **Section 4A.10 Responsibility for Operation and Maintenance**

414 *Guidance:*

415 *Prior to installing any highway traffic signal, the responsibility for the maintenance of the*
416 *signal and all of the appurtenances, hardware, software, and the timing plan(s) should be clearly*
417 *established by the responsible [agency](#).*

418 *To this end the agency should:*

- 419 *A. Keep every controller assembly in effective operation in accordance with its*
420 *predetermined timing schedule; check the operation of the controller assembly frequently*
421 *enough to verify that it is operating in accordance with the predetermined timing*
422 *schedule; and establish a policy to maintain a record of all timing changes and that only*
423 *authorized persons are permitted to make timing changes;*
- 424 *B. Clean the optical system of the signal sections and replace the light sources as frequently*
425 *as experience proves necessary;*
- 426 *C. Clean and service equipment and other appurtenances as frequently as experience proves*
427 *necessary;*
- 428 *D. Provide for alternate operation of the traffic control signal during a period of failure,*
429 *using flashing mode or manual control, or manual traffic direction by proper authorities*
430 *as might be required by traffic volumes or congestion, or by erecting other traffic control*
431 *devices;*
- 432 *E. Have properly skilled maintenance personnel available without undue delay for all signal*
433 *malfunctions and signal indication failures;*
- 434 *F. Provide spare equipment to minimize the interruption of highway traffic signal operation*
435 *as a result of equipment failure;*
- 436 *G. Provide for the availability of properly skilled maintenance personnel for the repair of all*
437 *components; and*
- 438 *H. Maintain the appearance of the signal displays and equipment.*