

PART 3. MARKINGS
CHAPTER 3A. GENERAL

Markings Technical Committee Recommendations
Approved by NCUTCD Council January 10 & 12, 2008

Additional Changes Approved by NCUTCD Council June 21, 2008

Yellow highlight indicates recommended changes to the NPA.

3A.01
Approved by
NC without
revisions to
NPA.

Section 3A.01 Functions and Limitations

Support:

Markings on highways, public facilities, and private property open to public travel have important functions in providing guidance and information for the road user. Major marking types include pavement and curb markings, ~~object markers,~~ delineators, colored pavements, barricades, channelizing devices and islands. In some cases, markings are used to supplement other traffic control devices such as signs, signals, and other markings. In other instances, markings are used alone to effectively convey regulations, guidance, or warnings in ways not obtainable by the use of other devices.

Markings have limitations. Visibility of the markings can be limited by snow, debris, and water on or adjacent to the markings. Marking durability is affected by material characteristics, traffic volumes, weather, and location. However, under most highway conditions, markings provide important information while allowing minimal diversion of attention from the roadway.

~~Pavement markings can enhance roadway delineation with the addition of audible and tactile features such as bars, differential surface profiles, raised pavement markers, or other devices intended to alert the road user that a delineation on the roadway is being traversed.~~

~~The general functions of longitudinal lines are:~~ **relocated to Section 3A.05 and upgraded to Standard**

- ~~A. A double line indicates maximum or special restrictions;~~
- ~~B. A solid line discourages or prohibits crossing (depending on the specific application);~~
- ~~C. A broken line indicates a permissive condition, and~~
- ~~D. A dotted line provides guidance.~~

3A.02
Approved by
NC without
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Section 3A.02 Standardization of Application

Standard:

Each standard marking shall be used only to convey the meaning prescribed for that marking in this Manual. When used for applications not described herein, markings shall conform in all respects to the principles and standards set forth herein.

Guidance:

Before any new highway, [public facility, private property open to public travel](#), paved detour, or temporary route is opened to ~~traffic~~ [public travel](#), all necessary markings should be in place.

Standard:

Markings that must be visible at night shall be retroreflective unless ambient illumination assures that the markings are adequately visible. All markings on Interstate highways shall be retroreflective.

Markings that are no longer applicable for roadway conditions or restrictions and that might cause confusion for the road user shall be removed or obliterated to be unidentifiable as a marking as soon as practical. **this sentence was relocated from the previous paragraph**

Option:

[Until they can be removed or obliterated](#), markings may be temporarily masked with tape [that is approximately the same color as the pavement](#) ~~until they can be removed or obliterated~~.

Section 3A.03 Materials

Support:

Pavement and curb markings are commonly placed by using paints or thermoplastics; however, other suitable marking materials, including raised pavement markers and colored pavements, are also used. Delineators, ~~object markers~~, barricades, and channelizing devices are visibly placed in a vertical position similar to signs above the roadway.

[Some marking systems consist of clumps or droplets of material with visible open spaces of bare pavement between the material droplets. These marking systems can function in a manner that is similar to the marking systems that completely cover the pavement surface and are suitable for use as pavement markings if they meet the other pavement marking requirements of the highway agency.](#)

Guidance:

The materials used for markings should provide the specified color throughout their useful life.

Consideration should be given to selecting pavement marking materials that will minimize tripping or loss of traction for [road users, such as](#) pedestrians, ~~and~~ bicyclists, [and motorcyclists](#).

~~Object markers and~~ **relocated to Section 2L.01** Delineators should not present a vertical or horizontal clearance obstacle for pedestrians.

3A.03
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NPA.
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3A.04
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Section 3A.04 Colors

Standard:

Markings shall be yellow, white, red, ~~or~~ blue, or purple. The colors for markings shall conform to the standard highway colors. Black in conjunction with one of the above colors shall be a usable color.

When used, white markings for longitudinal lines shall delineate:

- A. The separation of traffic flows in the same direction, or
- B. The right-hand edited to increase clarity edge of the roadway.

When used, yellow markings for longitudinal lines shall delineate:

- A. The separation of traffic traveling in opposite directions,
- B. The left-hand edited to increase clarity edge of the roadways of divided ~~and one-way~~ highways and one-way streets or edited to increase consistency ramps, or
- C. The separation of two-way left-turn lanes and reversible lanes from other lanes.

When used, red raised pavement markers or delineators shall delineate truck escape ramps, and one-way roadways or ramps that shall not be entered, or used in the direction from which the markers are visible or travel lanes such that the color red is visible to traffic proceeding in the wrong direction.

When used, blue markings shall supplement white markings for parking spaces for persons with disabilities.

Support:

~~When used, b-~~Blue raised pavement markers can be used to shall indicate locations of fire hydrants along a roadway. [EDITORIAL NOTE: added back to language as support from the 2003 statement as a standard.]

Standard:

When used, purple markings shall supplement lane line or edge line markings for toll plaza approach lanes that are used only by vehicles that are equipped with electronic toll collection (ETC) transponders (see Section 3B.29).

Option:

Appropriate colors may be used in a route shield pavement marking symbol, such as red, white, and blue for an Interstate highway route shield pavement marking and colors that closely resemble a state's sign route shield (see Figure 3B-25).

EDITORIAL NOTE: state route shields added to Figure 3B-25

Black may be used in combination with the above colors where a light-colored pavement does not provide sufficient contrast with the markings.

Support:

When used in combination with other colors, black is not considered a marking color, but only a contrast-enhancing system for the markings.

3A.05
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Section 3A.05 Functions, Widths, and Patterns of Longitudinal Pavement Markings

Standard:

The general functions of longitudinal lines shall be: **relocated from Section 3A.01 and upgraded to Standard**

- A. A double line indicates maximum or special restrictions,
- B. A solid line discourages or prohibits crossing (depending on the specific application),
- C. A broken line indicates a permissive condition, and
- D. A dotted line provides guidance.

The widths and patterns of longitudinal lines shall be as follows:

- A. **A-n** Normal line is shall be 100 to 150 mm (4 to 6 in) wide.
- B. **A-w** Wide line is shall be at least twice the width of a normal line. The width of the line shall indicate the degree of emphasis.
- C. **A-d** Double line shall consist of two parallel lines separated by a discernible space.
- D. **A-b** Broken line shall consist of normal line segments separated by gaps.
- E. **A-d** Dotted line shall consist of noticeably shorter line segments separated by shorter gaps than used for a broken line. The width of a dotted line shall be at least the same as the width of the line it extends.

Support:

The width of the line shall indicate the degree of emphasis.

Guidance:

Broken lines should consist of 3 m (10 ft) line segments and 9 m (30 ft) gaps, or dimensions in a similar ratio of line segments to gaps as appropriate for traffic speeds and need for delineation.

Support:

Dotted lines are used to extend lines through intersections or interchanges. Dotted lines are also used to provide guidance at acceleration, deceleration, auxiliary lanes, and lane drops. instead of broken lane lines to separate a continuing lane from a non-continuing lane, such as acceleration or deceleration lanes, auxiliary lanes, lane drops, and lane reductions.

Option Guidance:

A dotted line for line extensions within an intersection or taper area may should consist of 0.6 m (2 ft) line segments and 0.6 m (2 ft) to 1.8 m (6 ft) gaps. A dotted line for lane drop/add markings used as a lane line to separate a through or optional lane from a lane drop continuing lane from a non-continuing lane may should consist of 0.9 m (3 ft) line segments and 2.7 m (9 ft) gaps.

3A.06
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Section 3A.06 Definitions Relating to Pavement Markings

Standard:

The following technical terms, when used in Part 3, shall be defined as follows:

1. Neutral area—the paved area between the channelizing lines that separate an entrance or exit ramp and the adjacent through lane(s).
2. Physical gore—a longitudinal point where a physical barrier or the lack of a paved surface inhibits road users from crossing from a ramp to the adjacent through lane(s) or vice versa.
3. Theoretical gore—a longitudinal point at the upstream end of an exit ramp or island neutral area where the channelizing lines that separate the ramp or island from the adjacent through lane(s) begin to diverge or a longitudinal point at the downstream end of an entrance ramp or island neutral area where the channelizing lines that separate the ramp or island from the adjacent through lane(s) intersect each other.

[EDITORIAL NOTE: These definitions to be relocated to Part 1.]

Document Comments Related to Approval of Recommended Changes to the NPA

3A.04

Reference to purple markings is removed from this section based on input from the NCUTCD Toll Road Task Force which led to the deletion of purple markings from the NCUTCD recommended language.

Language related to the use of red RRPMS was revised to allow red RRPMS to be used on the far left side of two way roadways to indicate wrong way movement to vehicles on the wrong side of the center line. The use of red RRPMS in this application is supported by research conducted by TTI for FHWA. Additional changes are recommended for Chapter 3B related to this application.

The NPA text deleted the reference to the use of blue RRPMS for identifying fire hydrants as this was considered by FHWA to not be a traffic control device. The NCUTCD believes that there is value in this application of RRPMS and wants to retain the language in the MUTCD in a Support statement.

3A.05

The NCUTCD approved editorial changes in the way that the line widths are defined in this section. The statement about the width of the line indicating the degree of emphasis has been moved to a support statement because it does not function well as a shall statement.

Changes related to the language on dotted lines was added to make this section consistent with recommended changes in the pertinent sections of Chapter 3B.

3A.06

Islands have been added to the definition of a theoretical gore as the gore can exist on a freeway at a ramp or on an arterial street at an intersection. Based on NCUTCD action, all definitions are being moved into Part 1.