Northern Region Traffic Engineering Practice	No. 301.1
Pavement Marking at Intersections	July 20, 2012

The MUTCD and the Virginia Supplement to the MUTCD provide most of the guidance needed to design and install pavement markings at intersections, but some opportunity is left for local modifications. This document provides guidance on the following pavement markings, where used, in VDOT's Northern Region:

- Staggered Stop Bars in Right-Turn Lanes
- Longitudinal Turn Bay Markings
- Pavement Arrows and ONLY Word Markings
- Longitudinal Crosswalk Markings

The drawings entitled "NOVA District Typical Pavement Marking and Signing for Unsignalized Intersections" and "NOVA District Typical Pavement Marking and Signing for Signalized Intersections," both dated 1/11/2005, shall no longer be used for design or construction. These drawings are no longer consistent with the MUTCD and the Supplement.

Randall Dittberner
2012.07.20 14:11:51 -04'00'

VDOT - Traffic Engineering
Fairfax, VA
Traffic Engineer

STAGGERED STOP BARS IN RIGHT-TURN LANES

The Virginia Supplement allows stop lines to be "staggered longitudinally on a lane-by-lane basis" [1] on multi-lane approaches to a traffic signal or stop sign.

Staggered stop bars in right-turn lanes are intended to allow right-turning motorists to look beyond stopped traffic in adjacent lanes to safely identify a gap to turn right on red.

However, to provide a staggered stop bar for a right-turn lane, the stop bars for other lanes must typically be moved upstream to provide adequate clearance to the crosswalk or intersection approach. This has the effect of enlarging the intersection, which can complicate detection, lengthen traffic signal clearance times, and increase the length of drivers' paths through intersections (usually without the aid of markings).

If right-turning traffic must pull beyond the stop bar, for instance, into the crosswalk, to have an adequate view of approaching traffic, then the staggered stop bar creates the disadvantages above without providing any benefit to turning traffic.

The stop bar in right-turn lanes should be staggered up to 10 feet downstream of the stop bar for the other lanes only where the staggering can provide a sight-distance benefit to traffic turning right on red.

However, stop bars in right-turn lanes should not be staggered where any of the following conditions exist:

- *Where the right lane serves any movement other than an exclusive right turn*
- *Where right turns on red are prohibited*
- *Where there is a marked crosswalk across the approach (crossing the right-turn lane)*
- *Where the driver of a vehicle stopped at the stop bar in the right-turn lane does not have adequate sight distance to judge an appropriate gap for making a right turn on red*
- *Where the intersection size or configuration makes a staggered stop bar undesirable*

Where a right-turn is permissible from more than one lane, the stop bar shall not be staggered in any lane other than the right-most.

Stop bars may need to be staggered by lane for purposes other than for right-turn-on-red sight distance, such as to accommodate turning movements for large vehicles. This document does not limit other applications where stop bars are required to be staggered.

[1] Virginia Supplement to the MUTCD, Section 3B.16

LONGITUDINAL TURN BAY MARKINGS

A "turn bay" is a lane added on the approach to an intersection or other entrance for the exclusive use of a turning movement.

If through traffic is permitted to use the added lane, then it is not a turn bay. *It should be striped with the same markings used to separate other through lanes from each other*. However, turn bay markings may be more appropriate if the added lane becomes an exclusive turn bay a short distance downstream of the intersection or entrance.

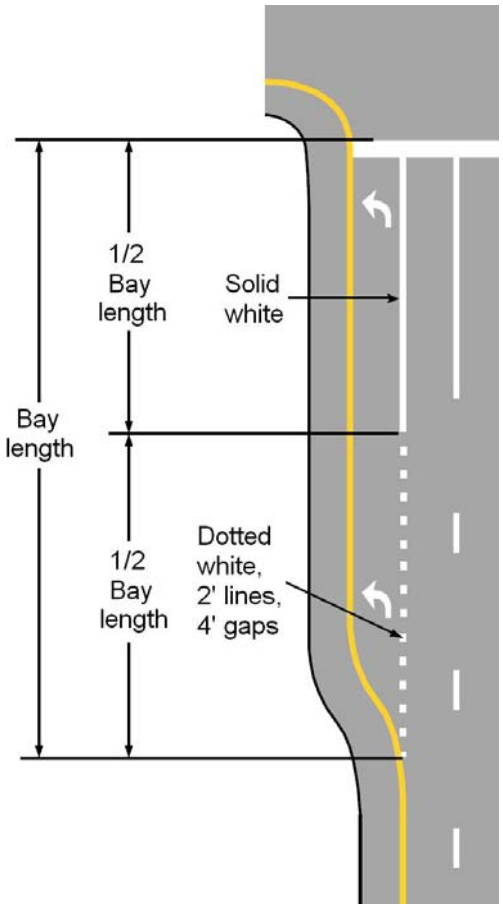
If the exclusive turn lane is not added on the approach, but rather is formed from an existing upstream travel lane, then the lane is not a turn bay. *It should be striped as a drop lane in accordance with the Virginia Supplement to the MUTCD.*

The markings separating a turn bay from the adjacent through lane shall consist of two parts. The length of each part shall be half of the total turn bay marking length, when measured from the beginning of the turn bay taper to the stop bar, or if no stop bar, the upstream boundary of the intersection.

- **The first half, starting at the beginning of the turn bay taper, shall consist of white dotted lines, 2 feet in length, separated by 4-foot gaps.**
- **The second half, ending at the stop bar or intersection boundary, shall consist of a white solid line.**

The width of the markings in both segments shall be the same as other normal longitudinal pavement markings on the roadway.

Typical turn bay markings are illustrated in the figure at right.



PAVEMENT ARROWS AND ONLY WORD MARKINGS

The Virginia Supplement to the MUTCD permits pavement arrows to be omitted in turn bays in cases where conditions "clearly discourage unintentional use of a turn bay by through vehicles." The following table summarizes the expected use of pavement arrows and ONLY word markings.

Condition	***Pavement arrows***	***ONLY word markings***
Left-turn lanes where drivers are permitted to turn left from more than one lane on an approach	**Shall be used**[2]	*Should be used*[3]
Drop lanes, where a mandatory turn lane is formed from an upstream travel lane	**Shall be used**[4]	**Shall be used**[5]
Opposing offset channelized left-turn lanes	*Should be used* (to discourage wrong-way movements)[6]	*Should not be used*
Turn bays with single-lane turning movements where the end of the bay is visible to drivers from the beginning of the taper, and without complex or unusual lane configuration or roadway geometry	*Should not be used*	*Should not be used*
All other turn lanes	*Should be used*[7]	May be used[8]

Lane use arrows and ONLY word markings may be used in other locations if needed based on engineering judgment.

Where used, lane use arrows and ONLY word markings shall be positioned and spaced in accordance with the Virginia Supplement to the MUTCD.

[2] Virginia Supplement to the MUTCD, Sec. 3B.20, paragraph 29
[3] Virginia Supplement to the MUTCD, Sec. 3B.20, paragraph 29
[4] Virginia Supplement to the MUTCD, Sec. 3B.20, paragraph 27
[5] Virginia Supplement to the MUTCD, Sec. 3B.20, paragraph 27
[6] Virginia Supplement to the MUTCD, Sec. 3B.20, paragraph 25
[7] Virginia Supplement to the MUTCD, Sec. 3B.20, paragraph 21
[8] Virginia Supplement to the MUTCD, Sec. 3B.20, paragraph 35

LONGITUDINAL CROSSWALK MARKINGS

Marked crosswalks may be delineated with either transverse markings (parallel to the crosswalk) or, where higher visibility is needed, longitudinal (sometimes called “ladder” or “continental”) markings.

Where longitudinal markings are used, the markings shall be parallel to the major flow of traffic on the street being crossed.

Where a crosswalk crosses the roadway at a skew, markings parallel to the flow of traffic are easier for motorists to distinguish as crosswalk markings and provide more consistent wear than markings perpendicular to the pedestrian flow.

Examples of correct and incorrect markings are shown below.