



National Committee on Uniform Traffic Control Devices

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ATTACHMENT NO. 1

RW Item No. 4

National Committee on Uniform Traffic Control Devices RWSTC RECOMMENDATION

REVISIONS FOLLOWING SPONSOR COMMENTS SHOWN IN YELLOW

TECHNICAL COMMITTEE: NCUTCD Regulatory/Warning Signs Technical Committee

DATE OF ACTION: 12-15-08

RWSTC APPROVAL DATE: 1-8-09

RWSTC APPROVAL FOLLOWING SPONSOR COMMENTS: June 19, 2009

TRANSMITTAL TO SPONSORS DATE: March 2, 2009

COUNCIL APPROVAL DATE: June 20, 2009

TOPIC: Multiway Stop Control

AFFECTED PORTIONS OF MUTCD: Section 2B.07 (NPA, Proposed 2009 MUTCD)

DISCUSSION/QUESTION:

The support statement in Section 2B.07 states:

Multiway stop control is used where the volume of traffic on the intersecting roads is approximately equal.

How do we define the term “approximately equal”?

Section 2B.07 guidance provides criteria in paragraph C as follows:

- Vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and
- The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours.

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This language provides a reasonable indication that approximately equal at the minimum value is a 200 units minor street/500 total volume. This is a ratio of 40% minor street volumes to the total volume. However, this does not provide a definition or indication of the maximum volumes on either the major or minor street. It only deals with the minimum volume end of the spectrum.

The Highway Capacity Manual (HCM) does provide some insights in Chapter 17, Unsignalized intersections. The critical criteria may be found in the critical gap and delay studies. The delay study along with the level of service at the intersection must be factored in along with the turning volumes. The MUTCD already has language in this section indicating a delay of at least 30 seconds for the minor street approach during the highest hour.

The principal elements affecting selection of intersection traffic control are:

- Functional classification of each intersecting street
- Peak hour traffic volumes (vehicular and pedestrian)
- Crash History
- Intersection geometrics
- Sight Distance

Functional classification and traffic volumes are the two parameters that larger influence the question of “approximately equal volumes”.

The classification of intersecting legs should also be factored in before electing to use a multilane stop control.

- At a local –local intersection, no control or YIELD control is more appropriate.
- At a local-collector intersection, a YIELD or 1 or 2 Way STOP control is more appropriate.
- At a local- major intersection a 1 or 2 Way STOP control is more appropriate.
- Where a collector intersects with a collector with medium vehicular activity level, a all-way STOP may be appropriate
- Where Two Major Roadways intersect, an all-way STOP may be appropriate or signal.

ITE studies have demonstrated that when the 8 hour minimum volumes from all approaches of 180-400 vehicles per hour with at least 40% from the minor or secondary street would then provide the point at which a multiway stop could be considered. More recent studies have shown that when the 8 hour minimum volumes from all approaches of 500 vehicles per hour with at least 40% from the minor or secondary street would provide the point at which a multiway stop could be considered, in addition to the sight distance criteria.

89 **RECOMMENDATION:**

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91 The language in the MUTCD, Section 2B.07 be modified to define “approximately
92 equal” as 40% minor street total volumes to the total of all approaches at the intersection.

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94 **RECOMMENDED WORDING:**

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96 **Section 2B.07 Multiway Stop Applications.**

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98 Support:

99 Multiway stop control can be useful as a safety measure at intersections if certain
100 traffic conditions exist. Safety concerns associated with multiway stops include
101 pedestrians, bicyclists, and all road users expecting other road users to stop. ~~Multiway
102 stop control is used where the volume of traffic on the intersecting roads is approximately
103 equal.~~

104 Guidance:

105 The decision to install multiway stop control should be based on an engineering study.

106 The following criteria should be considered in the engineering study for a multiway STOP
107 sign installation:

- 108 A. Where traffic control signals are justified, the multiway stop is an interim measure
109 that can be installed quickly to control traffic while arrangements are being made
110 for the installation of the traffic control signal.
- 111 B. A crash problem, as indicated by 5 or more reported crashes in a 12-month period
112 that are susceptible to correction by a multiway stop installation. Such crashes
113 include right- and left-turn collisions as well as right-angle collisions.
- 114 C. Minimum volumes:
- 115 1. The vehicular volume entering the intersection from the major street
116 approaches (total of both approaches) averages at least 300 vehicles per
117 hour for any 8 hours of an average day, and
 - 118 2. The combined vehicular, pedestrian, and bicycle volume entering the
119 intersection from the minor street approaches (total of both approaches)
120 is at least 40% of the total entering vehicular volume entering from all
121 approaches and averages at least 200 units per hour for the same 8
122 hours, with an average delay to minor-street vehicular traffic of at least 30
123 seconds per vehicle during the highest hour, but
 - 124 3. If the 85th-percentile approach speed of the major-street traffic exceeds
125 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants
126 criteria are 70 percent of the above values.
- 127 D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all
128 satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this
129 condition.

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131 RWSTC to Sponsors, 2009-01-08

132 Vote: For: Unanimous

133 Against:

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Abstentions:

Council Approved : June 20, 2009

u: multi-way stop control 2B.07 – RW # 4 following sponsor comments 5-24-09
revised 6-18-09