Attachment No. 17

RW SIGNS # 4

APPROVED BY NCUTCD COUNCIL ON JANUARY 19, 2007

National Committee on Uniform Traffic Control Devices
TECHNICAL COMMITTEE RECOMMENDATION TO NCUTCD COUNCIL

TECHNICAL COMMITTEE : **Regulatory/Warning Sign TC**

TASK FORCE: FHWA 2006 New issues – Issue # 19

DATE OF ACTION: 5-10-05 TASK FORCE (revised 5-14-06 and 5-21-06 , 5-25-06, 5-26-06), approved by RWSTC 6-29-06. REVISED FOLLOWING SPONSOR COMMENTS 12-26-06, Revised 1-2-07, Revised 1-8-07, Revised 1-17-07, edited Response and Proposal paragraphs 1-21-07.

REQUEST NUMBER

TOPIC: Application of 85th Percentile Speed to Designation of Altered Speed Limits

ORIGIN OF REQUEST: NPA R/W Sign issues – FHWA

DISCUSSION: Section 2B.13 Speed Limit Sign (R2-1) gives a standard, guidance, and option for use of the Speed Limit Sign. Use of the sign for statutory speed limits is unambiguous. The guidance statement says that non-statutory (or altered) speed limits "should" be based on the 85th percentile speed, but the option provides five other factors that may be considered. As a result altered speed limits are being set based on one or more of these factors with limited or no consideration for the 85th percentile speed.

Problem statement: (FROM NPA)

Add language to 2B.13 Speed Limits re Statutory speed limits and Altered speed zones and that the 85th percentile as a criterion applies to the Altered speed zones.

Response:

Speed limits and speed zoning remain one of the more controversial tasks for the traffic engineering profession. Driving behavior is an extension of social attitude, and the majority of drivers respond in a safe and reasonable manner as demonstrated by their consistently favorable driving records. For that and other reasons, traffic engineers have long held that the 85th percentile speed is a reasonable basis for posting speed limits. Research from FHWA as reported in the January/February 2003 issue of *Public Roads* found that motorists traveling below the 85th percentile speed have below-average crash rates; setting the speed limit near the

85th percentile speed and allowing a small tolerance permits law enforcement officials to target those drivers in the 95 percentile or higher range who have the highest crash risk.

Unfortunately, the 85th percentile speed is not always sufficient as a single criterion. In certain cases roadside development, the environment, parking practices, accident experience or pedestrian activity make a reduction in speed appropriate. In such cases the speed limit sign serves to warn motorists that conditions in the area are such that the speed reduction is reasonable. Proper use of speed limit~~s~~ sign**s** would instill confidence in the minds of drivers that the information on the speed limit sign is accurate and not simply a desire on the part of a policy maker to reduce speed arbitrarily for emotional or political reasons.

The option statement in 2B.13 recognizes the need for exceptions and addresses those exceptions. However, no guidance is given regarding the relation of those factors to the 85th percentile speed, and the effective result is two separate policy tracks for altered speed zone signing. In addition the three most obvious exceptions – school zones, construction zones, and downtown areas with many competing types of roadway users – are not even mentioned. Finally, no standard is provided concerning the maximum alteration from the 85th percentile ~~of~~ speed.

The Institute of Transportation Engineers 4M-25 Committee on Speed Zoning issued in 1996 a draft ~~of a~~ proposal recommended practice for speed zones that made a number of recommendations for changes in the application of engineering principles to speed zoning. A copy of the draft proposal is available at

http://www.motorists.com/issues/speed/SpeedZoneGuidelines.html

This draft proposal is a proper starting point for consideration of changes in Section 2B.13 and forms the basis for this recommendation.

The ITE draft guidelines mentioned a second statistical datum that is sometimes ignored in engineering studies, the 10 mile pace. The percentage of the vehicle stream that travels within the most common 10 mile range of speed is a critical measure of the uniformity of driver behavior and an indicator of the potential for accidents. Traffic streams with a high proportion of the vehicles in a common 10 MPH pace are inherently safer even at relatively high speeds due to the uniformity of speeds, while traffic streams with a very low percent of the traffic in a common 10 MPH often have erratic flows in which accidents are more likely due to differences in speeds and the necessity to brake, change lanes, or accelerate. Low 10 MPH pace percentages may reflect the presence of the factors mentioned in the Manual that may be included in a study. It should be recognized that the purpose of speed zoning is to increase the percentage of traffic driving within the 10 mph Pace Speed resulting in a decrease in vehicle conflicts, improved traffic flow, and increased roadway safety.

The above discussion forms a basis for further development by the RWSTC of Section 2B.13; however, this proposal focuses only on the NPA problem statement related to statuatory speed.

Proposal

Change Section 2B.13 to state that non-statutory (or altered) speed zones shall only be established on the basis of an engineering study The engineering study shall include an analysis of the current speed distribution of free-flowing vehicles.

In the definitions, change "Pace Speed" to "Pace" and adjust the definition to follow the actual practice.

~~Add to the guidance statement that speed zones should not be used to warn motorists of~~

RECOMMENDED WORDING:

Proposed change (new language shown in red and underlined or in ~~strikethrough~~ format. – R/W Technical Committee task force – NCUTCD 5-10-05, revised 5-26-06, REVISED 12-26-06 AND 1-2-07, and 1-8-07 FOLLOWING SPONSOR COMMENTS; Revised 1-18-07 following tabling motion by the NCUTCD Council

Revise **Section 1A.13 Definitions of Words and Phrases in This Manual** as follows

Standard:

Unless otherwise defined herein, or in the other Parts of this Manual, definitions contained in the most recent edition of the "Uniform Vehicle Code," "AASHTO Transportation Glossary (Highway Definitions)," and other publications specified in Section 1A.11 are also incorporated and adopted by reference.

79. Speed—speed is defined based on the following classifications:

- **(a) Advisory Speed—a recommended speed for all vehicles operating on a section of highway and based on the highway design, operating characteristics, and conditions.**
- **(b) Average Speed—the summation of the instantaneous or spot-measured speeds at a specific location of vehicles divided by the number of vehicles observed.**
- **(c) Design Speed—a selected speed used to determine the various geometric design features of a roadway.**
- **(d) 85th-Percentile Speed—The speed at or below which 85 percent of the motor vehicles travel.**
- **(e) Operating Speed—a speed at which a typical vehicle or the overall traffic operates. Operating speed might be defined with speed values such as the average, pace, or 85th-percentile speeds.**
- **(f) ~~Pace Speed—the highest speed within a specific range of speeds that represents more vehicles than in any other like range of speed. The range of speeds typically used is 10 km/h or 10 mph.~~ Pace – The 10 mph speed range representing the speeds of the largest percentage of vehicles in the traffic stream.**
- **(g) Posted Speed—the speed limit determined by law and shown on Speed Limit signs.**
- **(h) Statutory Speed—a speed limit established by legislative action that typically is applicable for highways with specified design, functional, jurisdictional and/or location characteristic and is not necessarily shown on Speed Limit signs.**

80. Speed Limit—the maximum (or minimum) speed applicable to a section of highway as established by law.

82. Speed Zone—a section of highway with a speed limit that is established by law but which might be different from a legislatively specified statutory speed limit.

Section 2B.13 Speed Limit Sign

Standard:
Speed zones (other than Statutory Speed Limits) shall only be established on the basis of an engineering study in accordance with established traffic engineering practices. ~~After an engineering study has been made in accordance with established traffic engineering practices,~~ The Speed Limit (R2-1) sign (see Figure 2B-1) shall display the limit established by law, ordinance, regulation, or as adopted by the authorized agency based on the engineering study. The speed limits shown shall be in multiples of 10 km/h or 5 mph.

The engineering study shall include an analysis of the current speed distribution of free-flowing vehicles.

Guidance

At least once every 5 years, States and local agencies should reevaluate non-statutory speed limits on segments of their roadways that have undergone a significant change in roadway characteristics or surrounding land use since the last review.

No more than three speed limits should be displayed on any one Speed Limit sign or assembly.

When a speed limit is to be posted, it should be within 10 km/h or 5 mph of the 85th-percentile speed of free-flowing traffic.

Option:
Other factors that may be considered when establishing speed limits are the following:
A. Road characteristics, shoulder condition, grade, alignment, and sight distance;
B. The pace ~~speed~~;
C. Roadside development and environment;
D. Parking practices and pedestrian activity; and
E. Reported crash experience for at least a 12-month period.

Two types of Speed Limit signs may be used: one to designate passenger car speeds, including any nighttime information or minimum speed limit that might apply; and the other to show any special speed limits for trucks and other vehicles.

A changeable message sign that changes the speed limit for traffic and ambient conditions may be installed provided that the appropriate speed limit is shown at the proper times.

A changeable message sign that displays to approaching drivers the speed at which they are traveling may be installed in conjunction with a Speed Limit sign.

Guidance:
If a changeable message sign displaying approach speeds is installed, the legend YOUR SPEED XX km/h (MPH) or such similar legend should be shown. The color of the changeable message legend should be a yellow legend on a black background or the reverse of these colors.

Support:
Advisory Speed signs are discussed in Sections 2C.36 and 2C.46 and Temporary Traffic Control Zone Speed signs are discussed in Part 6.

U: fhwa 2006 new issue 19 speed limits 1-18-07 back to council - revised response and proposal 1-21-07.