



Texas Department of Transportation

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43156

September 1, 1998

FHWA Docket No. FHWA-97-3032 - 21
Docket Clerk
U.S. DOT Dockets Room PL-401
400 Seventh Street, S.W.
Washington, D.C. 20590-0001

DEPT. OF TRANSPORTATION
DOCKET SECTION
98 SEP 17 PM 12:30

Dear Docket Clerk:

The Texas Department of Transportation (TxDOT) has reviewed the Federal Register Notice dated December 5, 1997, (Volume 62, Number 234) Pages 64324 - 64327 regarding revisions to the Manual on Uniform Traffic Control Devices in Part 1, General Provisions, and Part 7, Traffic Control for School Areas. Our suggested revisions to the proposed changes are attached.

In general, we concur with these revisions and believe that our suggested changes will assist you in your effort. We appreciate the opportunity to comment.

If our department can be of further assistance, please contact Mr. David T. Newbern, P.E. at (512) 416-3200.

Sincerely,

Charles W. Heald, P.E.
Executive Director

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

INTRODUCTION

STANDARD:

Traffic control devices are all signs, signals, markings, islands and other devices used to regulate, warn, or guide traffic, placed on, over or adjacent to a street, highway, pedestrian facility, or bicycle path by authority of a public body or official having jurisdiction.

tab ↪ The Manual on Uniform Traffic Control Devices (MUTCD) is incorporated by reference in 23 Code of Federal Regulations (CFR), Part 655, Subpart F and recognized as the national standard for traffic control devices on all roads open to public travel. The policies and procedures of the Federal Highway Administration (FHWA) to obtain basic uniformity of traffic control devices are described in 23 CFR 655, Subpart F.

SUPPORT:

The need for uniform standards was recognized long ago. The American Association of State Highway Officials (AASHO), now known as American Association of State Highway Transportation Officials (AASHTO) published a manual for rural highways in 1927 and the National Conference on Street and Highway Safety (NCSHS) published a manual for urban streets in 1930. In the early years, the necessity for unification of the standards applicable to different classes of road and street systems was obvious. To meet this need, a joint committee of AASHO and NCSHS developed, and published in 1935, the original edition of this Manual of Uniform Traffic Control Devices (MUTCD). That committee, now called the National Committee on Uniform Traffic Control Devices (NCUTCD), though changed from time to time in name, organization, and personnel, has been in continuous existence and has contributed to periodic revisions of the Manual. The FHWA and its predecessor organizations have participated in the development and publishing of the previous editions. There were nine previous editions of the MUTCD and several editions were revised one or more times. Table I-1 traces the evolution of the MUTCD, including the prior manuals developed by AASHO and NCSHS.

The Secretary of Transportation, under authority granted by legislation in 1966, decreed that traffic control devices on all roads in each State shall be in substantial conformance with the standards issued or endorsed by the

Editorial Comment.

Editorial Comment.

Editorial Comment.

FHWA. Prior to 1966, compliance with the MUTCD was required for traffic control devices on Federal-aid roads only.

23 CFR, Part 655.603 adopts the MUTCD as the national standard for any street, highway, or bicycle trail open to public travel. The Uniform Vehicle Code (UVC) is one of the referenced documents contained in the MUTCD. The UVC contains a model set of motor vehicle and traffic laws for use throughout the Nation. As with the MUTCD, the UVC also includes language in Section 15-1 17 which states that, "No person shall install or maintain in any area of private property used by the public any sign, signal, marking or other device intended to regulate, warn, or guide traffic unless it conforms with the State manual and specifications adopted under Section 15- 104." Section 15-104 of the UVC adopts the MUTCD as the standard for conformance.

Editorial Comment.

Editorial Comment.

Year	Name	Month/Year Revised
1927	Manual and Specifications for the Manufacture, Display, and Erection of U.S. Standard Road Markers and Signs (for rural roads)	4/29,12/31
1930	Manual on Street Traffic Signs, Signals, and Markings (for urban streets)	No revisions
1935	Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)	2/39
1942	MUTCD - War Emergency Edition	No revisions
1948	MUTCD	9/54
1961	MUTCD	No revisions
1971	MUTCD	11/71, 4/72, 3/73, 10/73, 6/74, 6/75, 9/76, 12/77
1978	MUTCD	12/79, 12/83, 9/84, 3/86
1988	MUTCD	1/90, 3/92, 9/93, 11/94 12/96

Part 1. GENERAL PROVISIONS

1A.1 Purpose of Traffic Control Devices

SUPPORT:

The purpose of traffic control devices and warrants principles for their use is to promote highway safety and efficiency by providing for the orderly movement of all road users on streets and highways throughout the nation.

Traffic control devices notify road users of regulations and provide warning and guidance needed for the safe, **uniform**, and efficient operation of all elements of the traffic stream.

STANDARD:

Traffic control devices or their supports shall not bear any advertising message or any other message that is not essential to traffic control.

1A.2 Principles of Traffic Control Devices

SUPPORT:

This Manual contains the basic principles that govern the design and use of traffic control devices for all streets and highways open to public travel regardless of the type or class or the governmental body having jurisdiction. The text specifies the restriction on the use of a device if it is intended for limited application or for a specific system. It is important that these principles be given primary consideration in the selection and application of each device.

GUIDANCE:

To be effective, a traffic control device should meet five basic criteria:

1. Fulfill a need.
2. Command attention.
3. Convey a clear, simple meaning.
4. Command respect from road users.
5. Give adequate time for proper response.

The following aspects of traffic control devices should be considered to ensure that these criteria are met: design; placement and operation; maintenance; and uniformity. ~~Speed is just one of many elements that should be considered.~~

Traffic control devices should aid in the creating a uniform traffic stream.

Speed is just one of many elements that should be considered.

~~element that governs the design, operation, placement, and location of various traffic control devices.~~

SUPPORT:

The term speed can mean the 85th percentile, design, average, operating, posted or statutory speed. The definitions of these and other specific speed terms are contained in the references in Section 1 A. 14, Definitions of Words and Phrases.

GUIDANCE:

The policies and procedures of the FHWA to obtain basic uniformity of traffic control devices on all streets and highways are described in 23 CFR 655 Subpart F. The actions required of road users to obey regulatory devices should be specified by state statute, or in cases not covered by state statute, by local ordinance or resolution consistent with national standards.

The use of traffic control devices should provide the reasonable and prudent road user with the information necessary to safely and lawfully use the streets, highways, pedestrian facilities, and bicycle paths. Furthermore, the selection, application, design, placement, installation, operation, and maintenance of traffic control devices should be based on the minimum capabilities described in the Uniform Vehicle Code that a road user must possess to lawfully operate a vehicle.

SUPPORT:

Uniformity of the meaning of traffic control devices is vital to their effectiveness. The meanings ascribed to the devices in this Manual are in general accord with the documents mentioned in Section 1A. 12.

1A.3 Design of Traffic Control Devices

GUIDANCE:

Devices should be designed to assure that such features as size, contrast, colors, shape, composition, and lighting or retroreflection are combined to draw attention to the devices; that shape, size, colors, and simplicity of message combine to produce clear meaning; that legibility and size combine with placement to permit adequate time for response; and that uniformity, size, legibility, and reasonableness of the regulation combine to command respect.

STANDARD:

All symbols and sign colors shall be adopted using the procedure described in Section 1 A. 11. All symbols shall be unmistakably similar to or mirror images of those shown herein. Symbols and colors shall not be modified.

GUIDANCE:

Other aspects of a device's design should be modified only where there is a demonstrated need. Modifications should be kept to a minimum and should be done in a way that will preserve the essential characteristics of the device's appearance.

Option:

State and local highway agencies may develop word messages to notify road users of special regulations or to warn of special situations or hazards. With the exception of symbols and colors, minor modifications in the specific design elements of a devices may be made provided the essential appearance characteristics are preserved. Although the standard design of symbol signs cannot be modified, it may be appropriate to change the orientation of the symbol to better reflect the direction of travel.

1A.4 Placement and Operation of Traffic Control Devices**GUIDANCE:**

Placement of the device should assure that it is well within the cone of vision of the viewer so that it will command attention; that it is appropriately positioned with respect to location, object, or situation to which it applies to aid in conveying proper meaning; and that its location, combined with suitable legibility, is such that a road user has adequate time to make the proper response in both day and night conditions.

Traffic control devices should be placed and operated in a uniform and consistent manner to assist the road user in properly responding to the device, based on their previous exposure to similar traffic control situations.

Unnecessary traffic control devices should be removed. The fact that a device is in good physical condition should not be a basis for deferring needed replacement or change.

1A.5 Maintenance of Traffic Control Devices

GUIDANCE:

Functional maintenance of traffic control devices should be used to determine if certain devices need to be changed to meet current traffic conditions

Physical maintenance of traffic control devices should be performed to ensure legibility is retained, that the device is visible, and that it functions properly in relation to other traffic control devices in the vicinity.

SUPPORT:

Clean, legible, properly mounted devices in good working condition command the respect of road users.

1A.6 Uniformity of Traffic Control Devices

SUPPORT:

Uniformity of devices simplifies the task of the road user because it aids in recognition and understanding, thereby reducing perception/reaction time. It aids road users, police officers, and traffic courts by giving everyone the same interpretation. It aids public highway and traffic officials through efficiency in manufacture, installation, maintenance, and administration. Simply stated, uniformity means treating similar situations in the same way. The use of uniform traffic control devices does not, in itself, constitute uniformity. A standard device used where it is not appropriate is as objectionable as a nonstandard device; in fact, this may be worse, because such misuse may result in disrespect at those locations where the device is needed.

1A.7 Responsibility of Traffic Control Devices

STANDARD:

The responsibility for the design, placement, operation, maintenance, and uniformity of the traffic control devices shall rest with the public agency or the official having jurisdiction. 23 CFR 655.603 adopts the MUTCD as the national standard for all traffic control devices installed on any street, highway, or bicycle path open to public travel. When a State or other Federal agency MUTCD or supplement is required, they shall be in substantial conformance with the national MUTCD.

23 CFR 655.603 also states that traffic control devices on all streets and highways open to public travel in each State shall be in substantial conformance with standards issued or endorsed by the Federal Highway Administrator.

SUPPORT:

The Uniform Vehicle Code has the following provision in Section 15- 104 for the adoption of a uniform Manual:

“(a) The [State Highway Agency] shall adopt a manual and specification for a uniform system of traffic-control devices consistent with the provisions of this code for use upon highways within this State. Such uniform system shall correlate with and so far as possible conform to the system set forth in the most recent edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, and other standards issued or endorsed by the Federal Highway Administrator.

“(b) The Manual adopted pursuant to subsection (a) shall have the force and effect of law.”

Additionally, States are encouraged to adopt Uniform Vehicle Code, Section 15- 117 which states that, “No person shall install or maintain in any area of private property used by the public any, sign, signal, marking, or other device intended to regulate, warn or guide traffic unless it conforms with the State manual and specifications adopted under § 15- 104.”

1A.8 Placement Authority

STANDARD:

Traffic control devices and other signs or messages within the highway right-of-way shall be placed only by a public authority or the official having jurisdiction, for the purpose of regulating, warning, or guiding traffic.

When the public authority or the official having jurisdiction over a street or highway has granted proper authority, others such as contractors and public utility companies shall be permitted to install construction and maintenance traffic control devices in temporary traffic control zones to protect the public, equipment, and works. Such traffic control devices shall conform to the standards of this Manual.

GUIDANCE:

Any unauthorized traffic control device or other sign or message placed on the highway right-of-way by a private organization or individual constitutes a public nuisance and should be removed. All unofficial and non-essential signs should be removed.

STANDARD:

All regulatory signs shall be supported by laws, ordinances, or regulations.

SUPPORT:

Provisions of this Manual are based on the concept that effective traffic control depends upon both appropriate application of the devices and reasonable enforcement of the regulations.

1A.9 Engineering Study or Judgment Required**STANDARD:**

This Manual describes the application of traffic control devices, but shall not be a legal requirement for their installation, unless so stated in any specific section.

GUIDANCE:

The decision to use a particular device at a particular location should be made on the basis of either an engineering study or the application of engineering judgment. Thus, while this Manual provides standards for design and application of traffic control devices, the Manual should not be considered a substitute for engineer judgment.

Qualified engineers should exercise engineering judgment inherent in the selection and application of traffic control devices, just as in the location and design of road and streets which the devices compliment. Jurisdictions with responsibility for traffic control, that do not have qualified engineers on their staffs, should seek assistance from the State transportation agency, their county, a nearby large city, or a traffic engineering consultant.

1A.10 Meaning of STANDARD, GUIDANCE, OPTION, AND SUPPORT

SUPPORT:

The standard, guidance, option, and support material described in this edition of the MUTCD provide the traffic engineer with the information needed to make appropriate decisions regarding the use of traffic control devices on streets and highways. The material in this edition is organized to better differentiate between the required conditions for traffic control devices (standards) that must be satisfied and other conditions (guidance and options) which may or may not be applicable depending upon the particular circumstances of a situation.

Throughout this Manual the headings “Standard,” “Guidance,” “Option,” and “Support” are used to classify the nature of the text that follows.

STANDARD:

When used in this Manual the headings shall be defined as follows:

1. **Standard:** A statement of required, mandatory or specifically prohibitive practice regarding a traffic control device. All standards are labeled and the headings appear in uppercase, blocked, and bold type. The word “shall” is typically used. Standards are sometimes modified by options.
2. **Guidance:** A statement of recommended, but not mandatory practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All guidance statements are labeled and the headings appear in uppercase shaded type. The word “should” is typically used. Guidance statements are sometimes modified by options.
3. **Option:** A statement of practice which is a permissive conditions and carries no recommendation or mandate. Options may contain allowable modifications to a standard and/or guidance. All option statements are labeled and the headings appear in lowercase normal type. The word “may” is typically used.
4. **support:** An informational statement which does not convey any degree of mandate,

recommendation, authorization, prohibition, or enforceable condition. Support statements are labeled and the headings appear in uppercase normal type.

SUPPORT:

Figures, tables, and illustrations supplement the text and may constitute a Standard, Guidance, Option, or Support. The reader can refer to the appropriate text to determine the meaning of the figure, table, or illustration.

1A.11 Manual Changes, Interpretations and Authority to Experiment

STANDARD:

Use of devices that do not conform to the provisions of this Manual shall be prohibited unless the provisions of this section are followed.

SUPPORT:

Continuing advances in technology will produce changes in the highway, the vehicle, and in road user proficiency, and portions of the system of control devices in this Manual will require updating. In addition, unique situations often arise for device applications which might require interpretation or clarification of this Manual. It is important to have a procedure for recognizing these developments and for introducing new idea and modifications into the system.

GUIDANCE:

Requests for any change, interpretation or permission to experiment should be sent to Federal Highway Administration (FHWA), Office of Highway Safety (HHS-IO), 400 Seventh Street SW., Washington, D.C. 20590.

1. Change--A change includes consideration of new devices to replace a present standard device, additional devices to be added to the list of standard devices, or revisions to recommended application or meaning criteria.

Requests for a change in the Manual should contain the following information:

- (a) A statement indicating what change is proposed.

- (b) Any illustration which would be helpful to understand the request.
 - (c) Any supporting research data which is pertinent to the item being reviewed.
2. Interpretation--An interpretation includes application and operation of standard traffic control devices, official meaning of standard traffic control devices, or variations from standard device designs.

Requests for an interpretation of the Manual should contain the following information:

- (a) A concise statement of the interpretation being sought.
 - (b) A description of the condition which provoked the need for an interpretation.
 - (c) Any illustration which would be helpful to understand the request.
 - (d) Any supporting research data which is pertinent to the item being interpreted.
3. Experiment--Requests to experiment include consideration of testing or evaluating a new traffic control device, its application or manner of use, or a provision not specifically described in this Manual.

Requests for permission to experiment will be considered only when submitted by the governmental agency or private toll facility responsible for the operation of the road or street on which the experiment is to take place and should contain the following:

- (a) A statement indicating the nature of the problem.
- (b) A description of the proposed change, how it was developed, the manner in which it deviates from the standard, and how it is expected to be an improvement over existing standards..
- (c) Any illustration which would be helpful to understand the experimental device or use of the device.

- (d) Any supporting data explaining how the device was developed, if it has been tried, in what ways was it found to be adequate or inadequate, and how this choice of device or application was derived.
- (e) A detailed research or evaluation plan including the time period and location(s) of the experiment. This plan must also provide for close monitoring of the experimentation, especially in the early stages of field implementation.
- (f) An agreement to restore the experiment site to a condition which complies with the provisions of the Manual within 3 months following the end of the time period of the experiment. This agreement must also provide that the agency sponsoring the experimentation will terminate the experimentation at any time that it determines significant safety hazards are directly or indirectly attributable to the experimentation. The Office of Highway Safety may also terminate approval of the experimentation at any time if there is an indication of hazards. If, as a result of the experimentation, a request is made that the Manual be changed to include the device or application being experimented with, the device or application may remain in place until an official rulemaking action has occurred.
- (g) An agreement to provide semiannual progress reports for the duration of the experimentation and to provide a copy of the final results of the experimentation to the Office of Highway Safety (HHS-10), within 3 months following completion of the experimentation. The Office of Highway Safety may terminate approval of the experimentation if reports are not provided in accordance to this schedule.

SUPPORT:

Procedures for revising the Manual are set out in the Federal Register of June 30, 1983, (48 FR 30145).

For additional copies of information concerning changes, interpretations, or experimentation, write to the FHWA (HHS-IO), 400 Seventh Street SW., Washington, D.C. 20590

1A.12 Relation to Other Documents**SUPPORT:**

Two publications by the National Committee on Uniform Traffic Laws and Ordinances are specifically designed to provide the content and language of legislation needed to give regulatory devices the same meaning in all jurisdiction. These are the Uniform Vehicle Code and the Model Traffic Ordinance. Both the Code and the Ordinance require the placing of signs or other traffic control devices to make some of their provisions effective, and both define the legal meaning of certain devices. The Code directs State authorities to adopt a manual for a uniform system of traffic control devices, and requires all devices to conform thereto. The Ordinance also requires municipalities or other local governments to conform with the State manual for traffic control devices. The adoption of appropriate legislation is an essential step toward uniformity.

STANDARD:

To the extent they are incorporated by specific reference, the latest editions of the following documents, or those editions specifically noted, shall be part of this Manual:

“Standard Alphabets for Highway Signs and Pavement Markings,” FHWA

“Standard Color Tolerance Limits,” FHWA

“Standard Highway Signs,” FHWA

“Vehicle Traffic Control Signal Heads,” Institute of Transportation Engineers (ITE)

“Pedestrian Traffic Control Signal Indications,” ITE

“Purchase Specification for Flashing and Steady Bum Warning Lights,” ITE

“Traffic Signal Lamps,” ITE

“Uniform Vehicle Code” and “Model Traffic Ordinance”, National Committee on Uniform Traffic Laws and Ordinances.

SUPPORT:

Other documents that are useful sources of information with respect to utilization of these standards include:

“Traffic Engineering Handbook”, ITE

“Highway Capacity Manual,” Transportation Research Board (TRB)

“A Policy on Geometric Design of Highways and Streets,” American Association of State Highway and Transportation Officials (AASHTO)

“Guidelines for the Selection of Supplemental Guide Signs for Traffic Generators Adjacent to Freeways, (AASHTO)

List of Control Cities Use in Guide Signs on Interstate Highways,” AASHTO

“Manual on Traffic Engineering Studies,” ITE

“Manual of Transportation Engineering Studies,” ITE

“Roadside Design Guide,” AASHTO

“School Trip Safety Program Guidelines,” ITE

“Manual of Traffic Signal Design,” ITE

“Traffic Signal Installation and Maintenance Manual,” ITE

“Traffic Detector Handbook,” ITE

“Signal Manual of Recommended Practice,” Association of American Railroads (AAR)

1A.13 Color Code

SUPPORT:

The following color code establishes general meanings for eight colors of a total of twelve colors that

have been identified as being appropriate for use in conveying traffic control information. Central values and the tolerance limits for each color are available from the Federal Highway Administration, (HHS- 10), 400 Seventh Street, SW., Washington, D.C. 20590.

The four colors for which general meanings have not yet been assigned are being reserved for future applications that will be determined only by FHWA after consultation with the States, the engineering community, and the general public. The meanings described in this Section are of a general nature. More specific assignments of color are given in the individual Parts of this Manual relating to each class of devices.

STANDARD:

Color Code:

- YELLOWGeneralwarning
- REDStop or prohibition
- BLUE Road users services guidance,
tourist information, and
Civil defense evacuation route
- GREEN Indicated movements permitted,
direction guidance
- BROWN Recreational and cultural
interest guidance
- ORANGE Temporary traffic control
- BLACKRegulation
- WHITE Regulation
- PURPLE Unassigned
- FLUORESCENT YELLOW-GREEN Unassigned
- LIGHT BLUE Unassigned
- CORAL Unassigned

1A.14 Definitions of Words and Phrases

STANDARD:

All words and phrases used in this Manual shall have the meaning described herein. Unless otherwise defined herein, or in other parts of this Manual, definitions contained in the most recent edition of the Uniform Vehicle Code, AASHTO Transportation Glossary (Highway Definitions), and other documents specified in Section 1 A. 12 are also incorporated by reference.

85th percentile speed

The speed at or below which eighty-five percent of the vehicles travel.

active highway-rail grade crossing warning system

The flashing signals, with or without warning gates, together with the necessary control equipment used to inform road users of the approach or presence of trains at the grade crossing.

actuated (operation)

Operation of a controller unit in which some or all phases are operated on the basis of actuation.

actuation

Initiation of a change in traffic signal phase through the operation of any type of detector.

advisory speed

A recommended safe speed for all typical vehicles operation on a section of highway and based on an engineering study of the highway design and operating characteristics.

approach

All lanes of traffic moving towards an intersection or mid-block location from one direction, including any adjacent parking lane(s).

arterial highway

A general term denoting a highway primarily use by through traffic, usually on a continuous route or a highway designated as part of an arterial highway system.

average day

A day representing traffic volumes normally and repeatedly found at that location, typically a weekday when volumes are influenced by employment or a weekend day when volumes are influenced by entertainment or recreation.

average speed

The summation of the distances traveled divided by the summation of the time in motion to traverse the distances for all vehicles. Also may be the summation of the measured speeds of vehicles divided by the number of vehicles observed.

backplate

A thin strip of material that extends outward from and parallel to a signal face on all sides of a signal housing to provide a background for improved visibility of the signal indications.

bicycle

A pedal-powered vehicle upon which the human operator sits.

bicycle path

A separate trail or path from which motor vehicles are prohibited and which is for the exclusive use of bicycles or the shared use of bicycles and pedestrians. Where such trail or path forms a part of a highway, it is separated from the roadways for motor vehicle traffic by an open space or barrier.

bicycle route

A system of bikeways designated by appropriate route markers, and by the jurisdiction having authority.

bikeway

Any road, street, path, or way which in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

center line markings

The yellow pavement marking line(s) that delineate the separation of traffic lanes which have opposite directions of travel on a roadway. These markings need not be at the geometrical center of the pavement.

changeable message sign

A sign with the flexibility to display various messages.

channelizing line markings

White pavement marking lines that **define the neutral area, direct exiting traffic at the proper angle for smooth divergence into the ramp,** and reduce the

White pavement marking lines that **provide alignment** and reduce the probability of collision with objects adjacent to the roadway **or other roadway users occupying adjacent lanes.** *This definition will include the use of channelizing lines at intersections and through intersections.*

probability of collision with objects adjacent to the roadway.

See comment above.

collector highway

A general term denoting a highway which in rural areas connects small towns and local highways to arterial highways, and in urban areas provides land access and traffic circulation within residential, commercial and business areas and connects local highways to the arterial highways. This highway may be designated as part of a collector highway system.

conflict monitor

A device used to detect and respond to improper or conflicting signal indications and improper operating voltages in a traffic controller assembly.

controller assembly

A complete electrical device mounted in a cabinet for controlling the operation of a highway traffic signal installation.

Need to add a definition for a "conventional roadway" (i.e., non-expressway, non-freeway)

controller unit

Part of a controller assembly that is devoted to the selection and timing of the display of signal indications.

coordination

The establishment of timed relationships between the interval sequences of adjacent signal installations.

crosswalk

(a) That part of the roadway at an intersection included within the connections of lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, and in the absence of a sidewalk on one side of the roadway, the part of the roadway included within the extension of the lateral lines of the existing sidewalk at right angles to the centerline.

(b) Any portion of the roadway at an intersection or elsewhere distinctly indicated for pedestrian crossing by lines or other markings on the surface.

crosswalk lines

White pavement marking lines that mark both edges of a crosswalk.

cycle length

The time required for one complete sequence of signal indications.

dark mode

The lack of all signal indications at a signalized location> (The dark mode most commonly results from power failures.)

design speed

A speed determined by the design and correlation of the physical features of a highway that influence vehicle operation.

detector

A device used ~~for indicating~~ the presence or passage of vehicles or pedestrians.

edge line markings

White or yellow pavement marking lines that delineates the right or left edge(s) of a roadway.

end of roadway marker

A device used to warn and alert road users of the end of a roadway in other than construction and maintenance areas.

engineering judgment

The evaluation of available pertinent information, and the application of appropriate principles, standards, guidance, and practice as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, or installation of a traffic control device.

Engineering judgment shall be exercised by an engineer, or by an individual, working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Documentation of engineering judgment is not required.

A device used to ~~identify or register~~ the presence or passage of vehicles or pedestrians. *This definition more correctly fits the function of a detector.*

engineering study

The comprehensive analysis and evaluation of available pertinent information, and the application of appropriate principles, standards, guidance, and practice, contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, or installation of a traffic control device. An engineering study shall be performed by an engineer, or by an individual, working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. An engineering study shall be documented.

flasher

A device used to turn signal indications on and off at a repetitive rate.

flashing (flashing mode)

A mode of operation in which a traffic signal indication is turned on and off repetitively.

flashing beacon

A highway traffic signal with one or more signal sections that operates in a flashing mode.

full-actuated operation

A type of operation in which all signal phases of a controller unit function on the basis of actuation.

guide signs

A sign that shows route designations, destinations, directions, distances, services, points of interest, or other geographical, recreational, or cultural information.

highway-rail grade crossing (roadway-rail intersection)

The general area where a highway and a railroad cross at the same level, within which are included the railroad, roadway and roadside facilities for traversing that area.

highway, road, or street

General terms denoting a public way for purposes of travel, including the entire area within the right-of-way.

highway traffic signal

A power-operated traffic control device by which traffic is warned or directed to take some specific action. These devices do not include power operated signs, barricade warning lights, or steady burning electric lamps.

intersection

(a) The area embraced within the prolongation or connection of the lateral curb lines, or if none, the lateral boundary lines of the roadways of two highways that join one another at, or approximately at, right angles, or the area within which vehicles traveling on different highways that join at any other angle may come into conflict.

(b) If a highway includes two roadways 9 meters (30 ft) or more apart, then every crossing of each roadway of such divided highway by an intersecting highway shall be regarded as a separate intersection. If the intersecting highway also includes two roadways 9 meters (30 ft) or more apart, then every crossing of two roadways of such highways shall be regarded as a separate intersection.

(c) The junction of an alley or driveway with a roadway or highway shall not constitute an intersection.

interval

The part of a signal cycle during which signal indications do not change.

interval sequence

The order of appearance of signal indications during successive intervals of a signal cycle.

island

A defined area between traffic lanes for control of vehicular movements or for pedestrian refuge. Within an intersection area, a median or outer separation is considered to be an island.

lane line markings

The white pavement marking line(s) that delineate the separation of traffic lanes that have the same direction of travel on a roadway.

lane-use control signal

An overhead signal displaying indications to permit or prohibit the use of specific lanes of a roadway or indicate the impending prohibition of such use.

lens (see signal lens)

louver

A device that can be mounted inside a signal visor to restrict visibility of a signal indication from the side or to limit the visibility of the signal indication to a certain lane or lanes.

major roadway

The roadway normally carrying the higher volume of vehicular traffic.

malfunction management unit

Same as conflict monitor.

median

Area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width may be different between intersections, and at opposite approaches of the same intersection.

minor approach

The roadway normally carrying the lower volume of vehicular traffic.

network

A geographical arrangement of intersecting roadways.

object markers

Devices used to mark obstructions within or adjacent to the roadway.

operating speed

A speed at which a typical vehicle or the overall traffic operates. May be defined with speed values such as the average, pace, or 85th percentile speeds.

pace speed

The highest speed within a specific range of speeds which represents more vehicles than in any other like range of speed. The range of speeds typically used is 10 mph.

How is pace speed relevant? What is its intended use?

pedestrian

A person afoot, in a wheelchair, on skates, or on a skateboard.

pedestrian change interval

An interval during which the flashing DONT WALK indication is displayed.

pedestrian clearance time

The time provided for a pedestrian crossing in a crosswalk, after leaving the curb or shoulder, to travel to the far side of the traveled way or to a median.

pedestrian signal head

A signal head that is installed to direct pedestrian traffic at signal installation.

permitted mode

A mode of traffic control signal operation in which left or right turns may be made when a CIRCULAR GREEN indication is displayed after yielding to oncoming traffic and ~~or~~ pedestrians.

A motorist must yield to both oncoming traffic and pedestrians. The "or" is not needed.

platoon

A group of vehicles or pedestrians traveling together as a group, either voluntarily or involuntarily, because of traffic signal controls, geometrics, or other factors.

posted speed

A speed limit displayed on a traffic control device ~~and which is established by law.~~

In Texas, posted speed is supposed to be backed by law. Also, it is stated in Section 1A.2 that regulatory signs (i.e., speed limit signs) should be backed by state statute, local ordinance, or local resolution. To not say this here, gives the "casual" user the impression that they can put up a speed limit signs whenever they like.

preemption control

The transfer of normal operation of traffic control signals to a special control mode.

preferential bicycle lane

A portion of a roadway or shoulder which has been designated for use by bicyclists. It is distinguished from the portion of roadway for motor vehicle traffic by a paint stripe, curb, or other similar device.

preferential lane marking

Consists of white lines formed into a diamond shape.

pretimed operation

A type of controller unit operation during which the ~~length of various intervals remains constant.~~

... which the **intervals are of a constant duration.** *During pretimed operation, all intervals are constant.*

priority control

A means by which the assignment of right-of-way is obtained or modified.

protected mode

A mode of traffic control signal operation in which left or right turns may be made only when a left or right GREEN ARROW indication is displayed.

raised pavement marker

A device with a height of at least 10 mm (0.4 inch) mounted on or in a road surface and intended to supplement or substitute for pavement markings.

ramp control signal (ramp meter)

A traffic control signal installed to control the flow of traffic onto freeways at entrance ramps and freeway-to-freeway connections.

red clearance interval

An optional interval during which all directions are shown a red signal indication that follows a yellow change interval and precedes the next conflicting green interval.

regulatory signs

A sign that gives notice of traffic laws or regulations.

resistance gate (second gate)

A type of traffic gate located downstream of the moveable bridge warning gate which may provide a physical barrier to vehicular and/or pedestrian traffic when placed in the appropriate position. Additional information is contained in the AASHTO Standard Specifications for Moveable Highway Bridges.

retroreflectivity

The return of a point source illumination from a surface to its origin.

right-of-way [assignment]

Permitting vehicles and/or pedestrians to proceed in a lawful manner in preference to other vehicles or pedestrians by the display of signal indications.

road (see highway)

road delineators

Retroreflective devices mounted on or above the roadway surface and at the side of the roadway in a series to indicate the alignment of the roadway.

road user

A vehicular operator, bicyclist, or pedestrian within the highway.

roadway

That portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the sidewalk, berm, or shoulder even though such sidewalk, berm, or shoulder is used by persons riding bicycles or other human-powered vehicles. in the event that the highway includes two or more separate roadways, the term "roadway" as used herein shall refer to any such "roadway" separately but not to all such roadways collectively. Roadway includes parking lanes.

roadway-rail intersection (see highway-rail grade crossing)

Editorial Comment.

The FHWA has allowed Texas to substitute retroreflective raised pavement markers for post-mounted delineators.

Editorial Comment.

Editorial Comment.

second gate (see resistance gate)

semi-actuated operation

A type of operation of a controller unit in which one or more, but not all, signal phases ~~do not~~ function on the basis of actuation.

shared roadway

A roadway which is officially designated and marked as a bicycle route, but which is open to motor vehicle travel and upon which no bicycle lane is designated.

sidewalk

That portion of a street between the curb line, or the lateral line of the roadway, and the adjacent property line, intended for use by pedestrians.

sign illumination

Either internal or external lighting that shows the same color day or night. Street, highway, or strobe lighting shall not be considered as meeting this definition.

sign legend

All word messages, borders, logos, and symbol designs that are intended to convey specific meanings.

signal face

Front part of a signal head.

signal head

An assembly of one or more signal faces together with the associated signal housings.

signal housing

That part of the signal section that protects the light source and other components.

signal indication

The illumination of a signal lens or equivalent device or combination of several lenses or equivalent devices at the same time.

Editorial Comment. The statement has the same meaning with or without the “do not”.

signal installation

The traffic signal equipment, signal heads and their supports, and associated electrical circuitry at a particular location.

signal lens (lens)

That part of the signal section that projects the light coming directly from the light source and its reflector, if any.

signal phase

The right-of-way, changes, and clearance intervals under actuated operation.

signal section

The assembly of a signal housing, lens, and light source with necessary components and supporting hardware to be used for providing one signal indication.

signal system

Two or more traffic control signal installations operating in coordination.

signal visor

The part of a signal section that directs the signal indication specifically to approaching traffic and reduces the effect of direct external light entering the lens.

signal warrant

A threshold condition that, if found to be satisfied as part of an engineering study, shall result in analysis of other traffic conditions or factors to determine whether a traffic control signal or other improvement is justified.

speed

The 85th percentile, design, average, operating, posted or statutory speed as defined by the road authority for the engineering application.

speed limit

The maximum (or minimum) speed applicable to a section of highway as established by law.

speed measurement marking

A white transverse pavement marking placed on the roadway to assist in the enforcement of speed regulations.

speed zone

A section of highway with a speed limit which is established by law but which is different from a legislatively specified statutory speed limit. Often established by administrative action as permitted by law.

statutory speed

A speed limit established by legislative action which typically is applicable for highways with specified design, functional, jurisdictional and/or location characteristic.

steady (steady mode)

The continuous illumination of a signal indication for the duration of interval, phase, or consecutive phases. The steady mode is used when a signalized location is operated in a stop-and-go manner.

stop line

A solid white pavement marking line extending across approach lanes to indicate the point at which a stop is intended or required to be made.

street (see highway)

traffic

Pedestrians, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using any highway for purposes of travel.

traffic control devices

All signs, signals, markings, islands, and other devices used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, road, pedestrian facility, or bicycle path by authority of a public body or official having jurisdiction.

traffic control signal (traffic signal)

Any highway traffic signal by which traffic is alternately assigned right-of-way to the various movements at an intersection or other roadway location.

train

A locomotive or self-propelled unit which is assigned a train number, which operates on fixed rails or tracks and to which all other traffic must yield right-of-way by law.

transverse markings

Pavement marking that include shoulder markings, word and symbol markings, stop lines, crosswalk lines, speed measurement markings, parking space markings, and others.

traveled way

The portion of the roadway for the movement of vehicles, exclusive of the shoulders, berms, sidewalks, and parking lanes.

vehicle

Every device in, upon, or by which any person or property may be transported or drawn upon a highway, except trains. A light rail car operating on a roadway, to which other traffic is not required to yield the right-of-way by law, is a vehicle.

visibility-limited signal indication

A type of signal face, signal section, or signal indication designed to restrict the visibility of a signal indication from the side, or to limit the visibility of a signal indication to a certain lane or lanes, or to a certain distance from the stop line.

warning gate

A type of traffic gate designed to warn, but not to primarily provide a physical barrier to, vehicle and/or pedestrian traffic when placed in the appropriate position.

warning sign

A sign that calls attention to conditions on or adjacent to a highway or street that present a situation that may not be readily apparent to the road user.

warrant

A warrant describes threshold conditions to the engineer in evaluating the potential safety and operational benefits of traffic control devices and is based upon “average” or “normal” conditions. Warrants are not a substitute for engineering judgment. The fact that a warrant for a particular traffic control device is met is not conclusive justification for the installation of the device.

wrong-way arrows

Slender, elongated, white pavement marking arrows placed upstream from the ramp terminus to indicate the correct direction of traffic flow. They are intended primarily to warn wrong-way road users that they are going in the wrong direction.

yellow change interval

The first interval following the green right-of-way interval in which the signal indication for that phase is yellow.

Part 7. TRAFFIC CONTROLS FOR SCHOOL AREAS

7A. GENERAL

7A.1 Need for Standards

SUPPORT:

It is important to stress that regardless of the school location, the best way to achieve safe and effective traffic control is through the uniform application of realistic policies, practices, and standards developed through engineering studies.

Pedestrian safety depends upon public understanding of accepted methods for efficient traffic control. This principle is especially important in the control of pedestrians, bicycles, and other vehicles in the vicinity of schools. Neither school children nor vehicle operators can be expected to move safely in school zones unless they understand both the need for traffic controls and how these controls function for their benefit.

Procedures and devices that are not uniform cause confusion among pedestrians and vehicle operators, prompt wrong decisions, and contribute to crashes. To achieve uniformity of traffic control in school areas, comparable traffic situations must be treated in a consistent manner. Each traffic control device and control method described in this part fulfills a specific function related to specific traffic conditions.

A uniform approach to school area traffic controls assures the use of similar controls for similar situations (which promotes uniform behavior on the part of vehicle operators, pedestrians, and bicyclists).

GUIDANCE:

A school route plan for each school serving elementary to high school students should be prepared in order to develop uniformity in the use of school area traffic controls and to serve as the basis for a school traffic control plan for each school.

The school route plane, developed in a systematic manner by the school and traffic officials responsible for school pedestrian safety, should consist of a simple map showing streets, the school, existing traffic controls, established school walk routes, and established school crossings. A typical school route plan is shown in Figure 7-1.

STANDARD:

The type(s) of school area traffic control devices used, either warning or regulatory, shall be related to the volume and speed of traffic, street width, and the number and age of children using the crossing

GUIDANCE:

These devices should be included in a school traffic control plan.

SUPPORT:

The school traffic control plan permits the orderly review of school area traffic control needs, and the coordination of school/pedestrian safety education and engineering activities.

Reduced speed limit signs for school areas and crossings are included in this Manual solely for the purpose of standardizing signing for these zones and not as an endorsement of mandatory reduced speed zones.

7A.2 School Routes and Established School Crossings**SUPPORT:**

The planning criterion for school walk routes might make it necessary for children to walk an indirect route to an established school crossing located where there is existing traffic control and to avoid the use of a direct crossing where there is no existing traffic control.

GUIDANCE:

School walk routes should be planned to take advantage of the protection afforded by existing traffic controls.

The following factors should be considered when determining the feasibility of requiring children to walk a longer distance to a crossing with existing traffic control:

- (a) The availability of adequate, safe sidewalks or off-road sidewalk areas to and from the location with existing control,
- (b) The number of children using the crossing,
- (c) The age levels of the children using the crossing, and
- (d) The total extra walking distance.

7A.3 School Crossing Control Criteria

SUPPORT:

Alternate gaps and blockades are inherent in the vehicular traffic stream and are different at each crossing location. For safety, children must wait for a gap in traffic that is of sufficient duration to permit safe crossing. When the delay between occurrence of adequate gaps becomes excessive, children might become impatient and endanger themselves by attempting to cross the street during an inadequate gap.

A recommended method for determining the frequency and adequacy of gaps in the vehicular traffic stream is given in the Institute of Transportation Engineers' publication, *School Trip Safety Program Guidelines*.

7A.4 Scope

STANDARD:

This part sets forth basic principles and prescribes standards that shall be followed in the design, application, installation, and maintenance of all traffic control devices required for the special pedestrian conditions in school areas. Such devices and controls include signs, signals, markings, adult crossing guards, student patrols, and grade separated crossings.

Portable school signs shall not be used.
(Requirements discussed in Chapter 2A and Sections 2B-5 and 2B-15 are applicable.)

7A.5 Application of Standards

SUPPORT:

Sections 1A.2 and 1A.3 contain information regarding the application of standards.

7A.6 Engineering Study Required

SUPPORT:

Section 1A.9 contains information regarding engineering studies.

7A.7 Maintenance of Traffic Control Devices

SUPPORT:

Section 1A.5 contains information regarding the maintenance of traffic control devices.

7A.8 Placement Authority

SUPPORT:

Section 1A.8 contains information regarding placement authority for traffic control devices.

7A.9 Removal of Confusing Advertising

SUPPORT:

Section 1A.8 contains information regarding the removal of confusing advertising.

7A.10 Meaning of “Shall”, “Should”, and “May”

SUPPORT:

Section 1A. 10 contains information regarding meaning of shall, should, and may.

7B. SIGNS

7B.1 Size of School Signs

STANDARD:

The design of all school area sign shall comply with the “Standard Highway Signs” book. The size of signs to be used in school areas shall be as shown in Table 7B. 1

Sign	MUTCD Code	Conventional Roadways		
		Minimum	Standard	Special
SCHOOL ADVANCE WARNING	S1-1	750 mm x 750 mm 30 in x 30 in	900 mm x 900 mm 36 in x 36 in	1200mmx 1200mm 48 in x 48 in
SCHOOL CROSSWALK WARNING	S2-1	750 mm x 750 mm 30 in x 30 in	900 mm x 900 mm 36 in x 36 in	1200 mm x 1200mm 48 in x 48 in
SCHOOL BUS STOP AHEAD WARNING	S3-1	750 mm x 750 mm 30 in x 30 in	750 mm x 750 mm 30 in x 30 in	900 mm x 900 mm 36 in x 36 in
END SCHOOL ZONE	S5-2	600 mm x 750 mm 24 in x 30 in	600 mm x 750 mm 24 in x 30 in	900 mm x 1200 mm 36 in x 48 in
SPEED LIMIT (School Use)	R2-1	600 mm x 750 mm 24 in x 30 in	900 mm x 1200 mm 36 in x 48 in	1200mmx 1500 mm 48 in x 60 in
Alternate Plates for School Speed Limit Assembly Signs				
8:30 A M TO 5:30 P M	S4-1	600 mm x 250 mm 24 in x 10 in	900 mm x 375 mm 36 in x 15 in	1200 mm x 500 mm 48 in x 20 in
WHEN CHILDREN ARE PRESENT	S4-2	600 mm x 250 mm 24 in x 10 in	900 mm x 500 mm 36 in x 20 in	1200 mm x 750 mm 48 in x 30 in
SCHOOL	S4-3	600 mm x 200 mm 24 in x 8 in	900 mm x 300 mm 36 in x 12 in	1200 mm x 400 mm 48 in x 16 in
WHEN FLASHING	S4-4	600 mm x 250 mm 24 in x 10 in	900 mm x 375 mm 36 in x 15 in	1200 mm x 500 mm 48 in x 20 in

Table 7B. 1. Size of School Area Signs

STANDARD:

The “Standard” sized sign shall be used on public roads, streets, and highways unless engineering judgment determines that a “special” sized sign would be more appropriate.

Standard or minimum sized signs shall not be used on Expressways or Freeways where increased conspicuity and legibility is required.

Option:

The “Special” sized sign may be used for applications that require emphasis, improved recognition or increased legibility.

“Minimum” sized signs may be used.

Editorial Comment. Should be consistent with the “special” below it.

The minimum sized sign should not be allowed for the same reasons,

Editorial Comment

When may minimum sized signs be used? Low speed roadways?

7B.2 Illumination and Reflectorization

STANDARD:

The signs used for school area traffic control shall be retroreflectorized or illuminated when regularly scheduled classes begin or end during hours of darkness, and shall be retroreflectorized or illuminated when there is considerable use of school buildings by children during hours of darkness.

7B.3 Position of Signs

GUIDANCE:

Signs should be placed on positions where they will convey their messages most effectively without restricting lateral clearance or sight distances. Placement therefore should be accommodated to highway design, alignment, vehicle speed, and roadside development.

Signs should have a maximum practical clearance from the edge of the traveled way for safety of vehicles that might leave the roadway and strike the sign supports. Signs should not be closer than 1.8 m (6 ft) from the edge of a paved shoulder, or if none, 3.6 m (12 ft) from the edge of the traveled way.

Option:

In urban areas, if the lateral clearances indicated in the preceding paragraph are not practical, a lesser clearance of not less than 0.6 m (2 ft) from the face of the curb may be used. In urban areas, where sidewalk width is limited or existing poles are close to a curb, a clearance of 0.5 m (1.5 ft) from the curb face may be used.

7B.4 Height of Signs

SUPPORT:

Section 2A.23 of the 1988 MUTCD contains information regarding the height of signs.

7B.5 Installation of Signs

SUPPORT:

Section 2A.26 of the 1988 MUTCD contains information regarding the installation of signs.

7B.6 Lettering

SUPPORT:

The Standard Alphabets for Highway Signs and Pavement Markings contains information regarding sign lettering.

Editorial Comment.

7B.7 School Advanced Warning Sign (S1-1)

STANDARD:

The School Advanced Warning sign (S1-1) shall be used in advance of any installation of the School Crosswalk Warning sign (S2-1).

Where used, the sign shall be erected not less than 45 m (150 ft) nor more than 210 m (700 ft) in advance of the school grounds or school crossings.

Option:

The School Advance Warning sign (S1-1) may also be used in advance of established school crossings not adjacent to a school ground and in advance of the first installation of the School Speed Limit sign assembly.

GUIDANCE:

The School Advance Warning sign (S1-1) should be installed in advance of locations where school buildings or grounds are adjacent to the highway (see Figure 7-2).

7B.8 School Crosswalk Warning Sign (S2-1)

STANDARD:

A School Advance Warning sign (S1-1) shall be used in advance of every School Crosswalk Warning sign (S2-1).

GUIDANCE:

The School Crosswalk Warning sign (S2-1) should be installed at marked crosswalk(s) used by pupils going to and from school as determined by engineering study including signalized locations.

STANDARD:

The School Crosswalk Warning sign (S2-1) shall be used only at marked crosswalks adjacent to schools and those on established school pedestrian routes.

When used, the School Crosswalk Warning sign (S2-1) shall be installed at the marked crosswalk, or at the minimum distance possible in advance of the marked crosswalk.

The School Crosswalk Warning sign (S2-1) shall not be installed on approaches controlled by a STOP sign.

7B.9 School Bus Stop Ahead Warning Sign (S3-1)**GUIDANCE:**

The SCHOOL BUS STOP AHEAD Warning sign (S3-1) should be installed in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 150 m (500 ft) in advance and where there is no opportunity to relocate the bus stop to provide 150 m (500 ft) of visibility.

7B.10 Alternate Plates for School Speed Limit Assembly Signs (S4-1, S4-2, S4-3, S4-4)**STANDARD:**

The SCHOOL SPEED LIMIT assembly sign shall be used to indicate the speed limit where a reduced speed zone for a school area has been established (in accordance with law, based upon an engineering study) or where a speed limit is specified for such areas by statute. The SCHOOL SPEED LIMIT assembly sign (S5-1) shall be placed as shown in Figure 7-3.

The School Speed Limit assembly sign shall be either a fixed-message sign assembly or a changeable display type sign.

The fixed message assembly sign shall consist of a top panel (S4-3) with the legend SCHOOL in black on a yellow background, a Speed Limit sign (R2-1), and a bottom panel (S4-1) indicating the specific periods of the day and/or days of the week, when the special school speed limit applies.

The bottom panel shall have a black legend on a white background. The numerical speed limit

displayed on the sign shall be the limit established by law.

The end of an authorized and posted school speed zone shall be marked with a standard Speed Limit sign showing the speed limit for the section of highway which follows or with an END SCHOOL ZONE sign (S5-2).

GUIDANCE:

Because of special features, it may not always be practical to make changeable message signs conform in all respects to the accepted standards. However, during the periods the school speed limit is in force, their basic shape, message, legend layout, and colors should conform to the standard for the fixed-message sign.

A confirmation beacon or device to indicate the speed limit message is in operation should be considered for inclusion on the back of the changeable message sign.

Option:

Alternate legends such as “WHEN FLASHING” may be used if permitted by law, when the reduced speed limit is in effect.

Changeable message signs may be used to indicate the special school speed limit. If the sign is internally illuminated, it may have a white legend on a black background. Changeable message signs with flashing beacons may be used for the more critical situations, where greater emphasis of the special school speed limit is needed.

Changeable message signs may use blank-out messages or other methods to display the school speed limit only during the periods it applies. A Speed Limit Sign Beacon also may be used, with a WHEN FLASHING sign (S4-4), to identify the periods the school speed limit is in force. The lenses of the speed limit sign beacon may be positioned in the face of the school speed limit sign (S5-1).

7B.11 School Speed Zone Ahead Sign (S2-5a)

Option:

The School Speed Zone assembly sign may be used to inform the road **user** of a reduced speed zone

Editorial Comment (misspelling).

when engineering judgment indicates the need for advance notice.

STANDARD:

The School Speed Zone Ahead assembly sign shall consist of the Reduced Speed Ahead sign (R2-5a) in combination with the SCHOOL plate (S4-3) mounted above it.

The School Speed Zone Ahead assembly sign shall be followed by the School Speed Limit sign or a School Speed Limit assembly sign.

7B.12 Parking and Stopping Signs (R7 and R8 Series)

Option:

Parking and stopping regulatory signs may be used to prevent parked or waiting vehicles from blocking walking children's views, and drivers' views of the children, and to control vehicles as part of the school traffic plan.

Parking signs and other signs governing the stopping and standing of vehicles in school areas cover a wide variety of regulations. Typical examples of regulations are as follows:

1. No Parking 8:00 AM to 5:00 PM School Days Only.
2. No Stopping 8:00 AM to 5:00 PM School Days Only.
3. 5 Min Loading 8:00 AM to 5:00 PM School Days Only.

SUPPORT:

Reference! for parking regulations regarding the signing of school zone area contained in Sections 2B-31, 2B-32, and 2B-33.

Editorial Comment,

7C. MARKINGS

7C.1 Functions and Limitations

SUPPORT:

Markings have definite and important functions in a proper scheme of school area traffic control. In some cases, they are used to supplement the regulations or warnings provided by other devices, such as traffic signs or signals. In other instances, they are used alone and produce results that cannot be obtained by the use of any other device. In such cases, they serve as a very effective means of conveying certain regulations, guidance, and warnings that could not otherwise be made clearly understandable.

Editorial Comment.

Pavement markings have limitations. They might be obliterated by snow, might not be clearly visible when wet, and might not be durable when subjected to heavy traffic. In spite of these limitations, they have the advantage, under favorable conditions, of conveying warnings or information to the road user without diverting attention from the road.

7C.2 Standardization of Application

STANDARD:

Each standard marking shall only be used to convey the meaning prescribed for it in this Manual.

7C.3 Crosswalk Lines

STANDARD:

Crosswalk lines shall be solid white lines, marking both edges of the crosswalk. They shall be not less than 150 mm (6 in) nor greater than 600 mm (24 in) in width.

GUIDANCE:

Crosswalk lines should not be spaced less than 1.8 m (6 ft) apart.

Crosswalk lines on both sides of the crosswalk should extend across the full width of pavement to discourage diagonal walking between crosswalks.

Crosswalks should be marked at all intersections on established routes to school where there is

substantial conflict between vehicles and children, where children are encouraged to cross between intersections, or where children could not otherwise recognize the proper place to cross.

Option:

For added visibility, the area of the crosswalk may be marked with white lines at a 45-degree angle to the line of the crosswalk or with white lines parallel to traffic flow. When diagonal or longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be omitted.

GUIDANCE:

The diagonal or longitudinal lines should be 300 to 600 mm (12 to 24 in) wide and spaced 300 to 600 mm (12 to 24 in) apart. The spacing design should avoid the wheel paths.

7C.4 Stop Lines

STANDARD:

Stop lines are solid white lines extending across approach lanes to indicate the point at which the stop is to be made.

GUIDANCE:

Stop lines should be 300 to 600 mm (12 to 24 in) wide. Stop lines should be used where it is important to indicate the point behind which vehicles are required to stop, in compliance with a STOP sign, traffic, signal, or other legal requirement. Stop lines, where used, should be placed 1.2 m (4 ft) in advance of and parallel to the nearest crosswalk line. In absence of a marked crosswalk, the stop line should be placed at the desired stopping point, but should be placed no more than 9.3 m (30 ft) nor less than 1.2 m (4 ft) from the nearest edge of the intersecting traveled way.

7C.5 Curb Markings for Parking Regulations

SUPPORT:

Since yellow and white curb markings are used for delineation and visibility, it is usually advisable to establish parking regulations through the use of standard signs (Secs. 2B-3 1 to 33).

Option:

When local authorities prescribe special colors for curb markings as supplemental to standard signs, they may be used.

GUIDANCE:

When signs are not used, the meaning of the curb marking should be legibly marked on the curb.

STANDARD:

Signs shall be used with curb markings in those areas where curbs are frequently obliterated by accumulations of snow and ice.

7C.6 Pavement Word and Symbol Markings**SUPPORT:**

Word and symbol marking on the pavement are used for the purpose of guiding, warning, or regulating traffic.

STANDARD:

Word and symbol marking shall be white. Word and symbol markings shall not be used for mandatory messages except in support of standard signs.

GUIDANCE:

Large letters and numerals should be 2.4 m (8 ft) or more in height. All letters, numerals, symbols should be in accordance with Standard Alphabets for Highway Signs and Pavement Markings.

Word and symbol markings should be limited to not more than three lines of information.

If a word message consists of more than one word, it should read "up," i.e., the first word should be nearest to the road user.

The longitudinal space between word or symbol messages, including arrows, should be at least four times the height of the character for low speed roads, but not more than ten times the height of the character under any condition.

Pavement messages should not be more than one lane in width, except the “SCHOOL” message which may extend across two lanes. (See Figure 7-4 and 7-5).

The characters of a two-lane “SCHOOL” message should be 3 m (10 ft) or more in height. (See Figure 7-4).

Option:

Where approach speeds are low, smaller characters may be used.

7D. MARKINGS

SUPPORT:

The Standards, Guidance, and Options for traffic signals are contained in Part IV of the proposed new MUTCD, FHWA Docket No 96-47.

7E. CROSSING SUPERVISION

7E.1 Types of Crossing Supervision

SUPPORT:

There are two types of school crossing supervision:

1. Adult control of pedestrians and vehicles by adult guards or police officers.
2. Student control of only pedestrians with student patrols.

Information for the organization, operation and administration of adult crossing guard program are given in Civilian Guards For School Crossings' and Adult School Crossing Guards.²

Information for the organization, administration and operation of a student patrol program are given in Policies and Practices for School Safety Patrols.¹

7E.2 Adult Guards

Option:

Adult guards may be used to provide gaps in traffic at school crossing where an engineering study has shown that adequate gaps must be created (Section 7A-3).

7E.3 Choice of Adult Guards

SUPPORT:

High standards for selection of adult guards are essential.

GUIDANCE:

Adult guards should possess the following qualifications:

¹ Available from the Traffic Institute of Northwestern University, 405 Church St., Evanston, Illinois 60204.

² Available from the American Automobile Association, Falls Church, VA 22042.

³ ????????????

Editorial Comment.

No footnote to reference.

Missing Footnote.

Average intelligence

2. Good physical condition, including sight and hearing
3. Mental alertness
4. Neat appearance
5. Good character
6. Dependable
7. Sense of responsibility for safety of children!

7E.4 Uniform of Adult Guards and Safety Patrol

GUIDANCE:

Adult guards should be uniformed so that motorists can recognize them and respond to their signals. The uniforms should be distinctively different from those worn by regular police officers.

During daytime, nighttime, and twilight hours, adult guards and student patrols should wear high-visibility retroreflective material or clothing similar to that set forth in MUTCD Section 6E.3 (Revision 3, September 1993).

7E.5 Operating Procedures for Adult Guards

GUIDANCE:

Adult guards should not direct traffic in the usual police regulatory sense. In the control of traffic, they should pick opportune times to create a safe gap. At these times, their presence in the roadway serves as an indication that pedestrians are about to use the crosswalk, and all traffic must stop.

Option:

Adult crossing guards may use a 450 mm (18 in) paddle, similar to the one set forth in Section 6E-4, (Revision 3, September 1993) of the MUTCD.

STANDARD:

The paddle shall have "STOP" on one or both sides and it shall be retroreflectorized or illuminated when used during hours of darkness. The legend shall be at least 150 mm (6 in) series capital letters. The paddle shall be at least 450 mm (18 in) in size.

Editorial Comment (consistency of punctuation).

Editorial Comment (consistency of punctuation).

Editorial Comment.

*Editorial Comment (consistency of punctuation).
Part 6 of the Manual shows the STOP/SLOW paddle to be a minimum of 18 inches. Crossing guards should be allowed the option to use a larger STOP paddle if its beneficial.*

See comments for paragraph above.

7E.6 Police Officers

Option:

Police officers may be used for school crossing supervision.

7E.7 Student Patrols

Option:

Student patrols may be used to direct and control children at crossings near schools where there is no need to create adequate gaps in traffic.

Student patrols may be used to direct and control children at signalized intersections where turning movements are not problem, and to assist adult guards in the control of children at crossing locations used by large numbers of children.

GUIDANCE:

Student patrols should not be responsible for directing vehicular traffic. They should not function as police or adult guards.

7E.8 Choice of Student Patrols

GUIDANCE:

Student patrols should be carefully selected. They should be children from the 5th grade or higher. Leadership and reliability should be determining qualities for patrol membership.

Parental approval should be obtained in writing before a child is used as a member of a student patrol.

7E.9 Operating Procedures of Student Patrols

GUIDANCE:

Student patrols should control children, not vehicles. They should stop children ~~behind~~~~back of~~ the curb or edge of the roadway and allow them to cross only when there is an adequate gap in traffic.

Editorial Comment (“behind” is clearer than “back of”).

STANDARD:

Flagging devices used during periods of twilight or darkness shall be retroreflective or illuminated.

7E.10 High Visibility Clothing

GUIDANCE:

Adult guards and student patrols should wear either retroreflective material or clothing similar to that set forth in Section 6E-3, High Visibility Clothing (Revision 3, September 1993) of the MUTCD.

Editorial Comment (missing blocked-text heading).

Editorial Comment.

7F. GRADE SEPARATED CROSSINGS

Editorial Comment

7F.1 Function

Option:

Grade separated crossings may be used to physically separate the crossing of a very heavy volume of school pedestrian traffic and a heavy vehicular flow.

7F.2 Types of Grade Separated Crossings

Option:

Grade separated crossings may be either overpasses or underpasses.

GUIDANCE:

The design should follow the guidelines given in the published policies of the American Association of State Highway and Transportation Officials.' Experience has shown that for pedestrian crossings, overpasses are more satisfactory than underpasses, as overpasses are easier to maintain and supervise.

7F.3 Criteria for Use of Grade Separated Crossings

GUIDANCE:

Grade separated crossing should be considered only when the physical characteristics of location make such a structure feasible. If use of the grade separation will be less convenient than an at-grade crossing, barriers or supervision will be needed to assure a satisfactory level of use.

'A Policy on Geometric Design of Highways and Streets, 1984.