Manual on
Uniform Traffic
Control Devices
for Streets and Highways

PREPARED BY A JOINT COMMITTEE OF
American Association of
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Institute of Traffic Engineers
National Conference on
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INTRODUCTION

Uniformity in traffic laws and regulations was emphatically urged by the President's Highway Safety Conference held in Washington May 9–10, 1946, and is widely recognized as one of the most important objectives in the program to reduce accidents and facilitate the orderly flow of traffic. This Manual on Uniform Traffic Control Devices for Streets and Highways is an essential part of this uniformity plan, and its adoption was specifically recommended by the President's Conference.

Approved legislative standards for States and cities are available in Act V of the Uniform Vehicle Code—the Uniform Act Regulating Traffic on Highways—and in the Model Traffic Ordinance, respectively. 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 the State authorities to adopt a manual for a uniform system of traffic control devices, and the Ordinance requires devices under municipal jurisdiction to conform thereto.

The Federal-aid Highway Act of 1944 also recognizes the need for approved standards for traffic control devices, and as to highways receiving Federal aid authorizes the Commissioner of Public Roads to require that the devices conform to such standards.

Inasmuch as application of many parts of the manual involves engineering analyses, the counsel of traffic engineers is highly desirable in its use. If such counsel is not available, however, careful attention to the manual recommendations will make it possible to avoid many errors and pitfalls.

This edition of the manual supersedes all previous editions, including the original edition printed in 1935 and reprinted in 1937, mimeographed revisions made in 1939, and the War Emergency Edition issued in 1942. The Joint Committee on Uniform Traffic Control Devices, which has prepared the various editions, was originally made up of representatives of the American Association of State Highway Officials and the National Conference on Street and Highway Safety, but now has an equal number of representatives of each of those two organizations and of the Institute of Traffic Engineers.

This manual recognizes numerous developments in the field of traffic control and new needs resulting from higher traffic speeds since the last previous revision. Noteworthy are the advances in size, illumination, reflectorization, substitution of symbols for words, and other improvements to increase the effectiveness of signs; extension of the use and effectiveness of pavement markings; and developments in

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1 The Uniform Vehicle Code and the Model Traffic Ordinance were prepared by the National Conference on Street and Highway Safety as standards for uniform motor-vehicle legislation, and are published by the Public Roads Administration.

2 Since completing its contribution to this manual, the National Conference on Street and Highway Safety has been dissolved and its functions have been vested in the National Committee on Uniform Traffic Laws and Ordinances.
the use and design of islands. Important advances in the use of signals are also recognized, and part III includes discussion of the relative desirability of fixed-time and traffic-actuated signals under various conditions.

The manual contains the best existing judgment on several points on which research is now in progress or being arranged for by qualified agencies. Pending the completion of such research the manual presents alternatives on some points, subject to certain fundamental specifications. Included in this category are certain details of stop signs, no-passing-zone pavement markings, pedestrian signals, and the location and traffic control signals at intersections. In other similar cases the joint committee was able to agree on recommended standards as fully aware that there are differences in opinion and practice among able traffic engineers.

Because such questions, old and new, present a constant need for factual data, the joint committee has set up a continuing subcommittee on research. This subcommittee is to keep abreast of current research in the traffic field and to promote further studies needed for the standardization of traffic control devices. Future revisions of the manual thus can rest firmly on established facts of human behavior as affected by traffic control devices. To the subcommittee on research will be referred all questions that cannot promptly be answered from the experience of committee members or other qualified authorities.

Use and Misuse of Traffic Control Devices

Traffic control devices are increasingly necessary for regulating, warning, and guiding traffic. The details in this manual indicate their wide range and their proper application and operation.

Intersections are the most critical points in traffic control, and a large proportion of the control devices herein relate to intersections. An accurate determination of the degree of control, if any, needed at the intersection is highly important, as is proper selection of the design and operation details to effect that degree of control.

As previously stated, signs are required by law to indicate the applicability of certain traffic regulations. Adequate but not excessive use of warning signs, and sufficient well-designed and well-located route markers and destination signs also have great value in facilitating the orderly flow of traffic, as do well-considered pavement and curb markings and islands properly designed and located. Application of sound principles in the selection, installation, and operation of traffic signals is of the highest importance.

Misapplication of these traffic control devices, however, besides wasting public funds, has in numerous cases accomplished the reverse of the purpose intended, causing delay and confusion and promoting disrespect for and disregard of all control devices. In many communities the responsible authorities have not met problems relating to traffic control devices with scientific analysis but rather by haphazard experiment.

Two fundamental errors have been prevalent: (1) Placing traffic control devices without adequate study of the possible bad effect likely to result either where they are installed or at other points, and (2) in the case of traffic signals, operation in a manner and at times not justified by the conditions. The applicability of traffic control devices in any specific case cannot be determined by guesswork. It should be based on sound engineering principles established by factual studies of types and flow of traffic, accidents, speeds, delays, and physical conditions that will show the exact nature of the difficulty and indicate what particular devices or methods of control are needed. To the extent now believed feasible, this manual sets forth warrants for the different types of traffic control devices.

Responsibility for Selection and Installation

There is wide variation in official responsibility for the selection, installation, and maintenance of traffic control equipment. In many cities the responsibility is placed upon some branch of the police department. In an increasing number of the more progressive cities it is under the direction of a traffic engineer. In a growing number of states, also, broad regulatory authority has been established over the installation and operation of all traffic control devices throughout the state, including small communities and rural areas that otherwise would not have the benefit of expert engineering advice. Thus important progress is being made toward uniformity. The design, installation, and maintenance of traffic control devices on state highways is recognized as being the responsibility of a traffic engineering division in the state highway department.

Until uniform laws replace the present wide variation in state laws regarding signs and signals, some jurisdictions may have to permit deviations from the recommendations of this manual. Fortunately, good progress is being made in bringing about the enactment of the desired uniform laws, and eventually such deviations will be reduced to a minimum.

While considerable equipment now in use does not conform to the standards here set forth, a large part of it can be brought to substantial conformity without excessive cost. Whenever new equipment is purchased or replacements are made because of the need of repairs or because of obsolescence, strict adherence to the standards here set forth should govern the selection.

Definitions applicable throughout the manual follow this introduction. Four general groups of traffic control devices in common use are then treated, as follows: Part I—Signs, part II—Markings, part III—Signals, and part IV—Islands.

Definitions

The following words and phrases, when used in this manual, shall be understood to have the meanings respectively ascribed to them:

1. Relating to the HIGHWAY:

Street or Highway.—The entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicular travel.

Roadway.—That portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the berm or shoulder. In the event a highway includes two or more separate roadways the term "roadway" as used herein refers to any such roadway separately but not to all such roadways collectively.

Pavement.—That portion of a roadway having a constructed surface to facilitate vehicular traffic.

Curb Line.—The boundary between a roadway and a sidewalk, usually marked by a fixed curb rising above the level of the roadway.

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

Cross Walk.—(a) That part of a roadway at an intersection included within the connections of the 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.

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

Intersection.—(a) The area embraced within the prolongation or connection of the lateral center lines, or, if none, then the lateral boundary lines of the roadways of two highways which join one at another at, or approximately at, right angles; or the area within which vehicles traveling upon different highways joining this area at any other angle may come in conflict.

(b) Where a highway includes two roadways 30 feet or more apart, then every crossing of each roadway of such divided highway by an intersecting highway shall be regarded as a separate intersection. In the event such intersecting highway includes two roadways 30 feet or more apart, then every crossing of two roadways of such highways shall be regarded as a separate intersection.

Center Lane.—A lane of the roadway placed in the center of a roadway on which traffic moves in both directions, or dividing the roadway between traffic moving in opposite directions.

Lanes—A line other than a center line separating two traffic lanes.

Barrier Lane.—A distinctive longitudinal pavement line which, when placed in proper relation to a normal center or lane line, or to another barrier line, indicates that all traffic must keep to the right thereof.

Detecto.—A reflecting device mounted at the side of the roadway, in series, to indicate the alignment of the roadway.

5. Relating to SIGNALS (see also the glossary, appendix A):

Highway Traffic Signal.—Any power-operated traffic control device, except a sign, by which traffic is warned or is directed to take some specific action.

Traffic Control Signal.—A highway traffic signal which, through its indications, alternately directs traffic to stop and permits it to proceed.

Paved-Time Signal.—A traffic control signal which directs traffic to stop and permits it to proceed in accordance with a predetermining time schedule.

Traffic Actuated Signal.—A traffic control signal which directs traffic to stop and permits it to proceed in accordance with the demands of traffic as registered by the actuation of detectors or push buttons.

(a) Semi-Traffic-Actuated Signal.—A type of traffic-actuated signal which provides means for traffic actuation on one or more but not all approaches to the signal location.

(b) Full Traffic-Actuated Signal.—A type of traffic-actuated signal which provides means for traffic actuation on all approaches to the signal location.

(c) Speed-Control Signal.—A type of signal in which means are provided for traffic actuation on some or all approaches and which provides go indications in such a manner that vehicle speeds on one street are limited to a preselected maximum value.

Stop Signal.—A flashing red signal having the same function as a Stop sign.

Caution Signal.—A flashing yellow signal having the same general function as a warning sign.

6. Relating to ISLANDS:

Island.—An area within a roadway from which vehicle traffic is intended to be excluded, together with any area at the approach thereto occupied by protective deflecting or warning devices.

Pedestrian Island.—An island designed for the use and protection of pedestrians. Included are both loading and refuge islands.

Safety Zone.—The area or space officially set apart within a roadway for the exclusive use of pedestrians, and which is protected or is so marked or indicated by adequate signs as to be plainly visible at all times while set apart as a safety zone.

The foregoing definition of a safety zone is that contained in Act V of the Uniform Vehicle Code. A safety zone thus includes only the area intended to be occupied by pedestrians. For the purposes of this manual a pedestrian island includes the safety zone together with the area at the approach end occupied or outlined by protective deflecting or warning devices.

Loading Island.—A pedestrian island at a regular streetcar, bus, or trolley-bus stop especially provided for the protection of passengers.

Refuge Island.—A pedestrian island at or near a cross walk, to aid and protect pedestrians crossing the roadway.

Traffic Island.—An island designed to separate or direct streams of vehicle traffic. Included are both divisional and channelizing islands.

Divisional Island.—A traffic island, usually elongated and narrow, following the centerline of the roadway to separate traffic streams that flow in the same or opposite directions.

Channelizing Island.—A traffic island located to guide traffic streams along certain definite paths and to prevent the promiscuous movement of vehicles in what would otherwise be a widely extended roadway area.

Buffer.—A structure at the approach end of a safety zone designed to deflect or stop any vehicle which collides with it.

Prose.—An elongated extension of a buffer tapered and sloped downwards toward approaching traffic, so that a vehicle mounting it will drag thereon and come to a stop, thereby reducing its speed considerably.

Jiggle Bar.—A series of raised transverse bars placed on the pavement to make any wheel encroachment within the area obvious to a vehicle operator without loss of control of the vehicle.