

CHANGES PROPOSED

by

AMERICAN ENGINEERING COUNCIL COMMITTEE

in Report on

STREET TRAFFIC SIGNS, SIGNALS AND MARKINGS

May 29, 1930

The American Engineering Council Committee on Street Traffic Signs, Signals and Markings herewith presents certain changes made in its report which are fundamental and important. Those made for the purpose of clarification and editorial consideration are not listed herein.

Page 8. Recommendation 1.--Material and Finish

Add a new paragraph (d): Use non-corrosive screws and washers for attaching sign to its support in order to avoid discoloration.

Page 9. Recommendation 3.--Colors.

Insert new sentence at end of first paragraph of notes, as follows: The American Association of State Highway Officials has recently adopted the combination of red letters on a yellow background as an approved alternate to their original standard of black on yellow.

Page 10. Recommendation 5.--Illumination (top of page)

Change to read:

(b) Illuminated by light within or behind sign.

(c) Signs so located as to be illuminated adequately by street lights.

Page 10. Recommendation 7.--Height and Location

Change paragraph (a) to read:

(a) The center of a sign on a fixed post back of the curb shall be 8 feet above the road pavement, and no part of the sign shall be closer to the curb line than 12 inches.

Add a new paragraph:
(d) Signs should not unnecessarily be placed on, or within ten feet of, poles which have to be climbed.

Page 11. Recommendation 8. -- Railroad Crossing

Add new paragraph:

(d) In case of multiple tracks, there shall be mounted below the crossbuck arms a sign indicating in black letters on a white background, the number of tracks.

Page 12. Recommendation 12 $\frac{1}{2}$ (New) Railroad Crossing

At a railroad crossing where a stop is mandatory, use the stop sign (Figure 1) bearing the words "Rail" and "Road" in the message space.

Page 13. Recommendation 21. --Curve

Change first line to read: (a) At every curve having a radius of from 200 to 600 feet, etc.

Page 13. Recommendation 21 $\frac{1}{2}$ --Reverse Curve (New Recommendation)

(a) At any irregular series of curves where conditions require a reduction of speed, use the slow sign bearing the word "Curves" in 3-inch Series C letters and an arrow shaped so as to indicate the direction of the curves. (Figures 6 and 6a).

The direction of the entering curve should be indicated properly on the sign. Figure 5 reading from the bottom of the sign indicates that the initial turn is to the right followed by a turn to the left. At any irregular series of curves an alternative sign may be used provided the direction of the entering curve is properly indicated. Figure 6a shows a possible design of a symbol indicating more than two curves. This symbol can be revised or changed to fit conditions.

(b) The sign shall be illuminated at night.

Page 14. Recommendation 26 $\frac{1}{2}$ (New) Cross Street

(a) The caution sign with the words "Cross Street" in 3 $\frac{1}{2}$ -inch Series C letters in two lines in the message space (Figure 9), shall be placed at every crossing which is hazardous and requires caution but does not warrant a stop or slow sign.

(b) The sign shall be illuminated at night.

Page 16. Recommendation 35. --Direction

Change paragraph (c) to read:

(c) An arrow shall be placed in line with, and on the side of the message in the direction to be taken. (Figure 13) If two or more places are indicated, a separate arrow should be used for each.

Change item (1) under paragraph (e) to read:
(1) No Parking (No Standing, No Stopping) etc.

Add a footnote as follows:

A reversal of the colors for background and lettering is permissible provided the code meaning of the colors is retained, namely, red for prohibited parking and green for permitted parking.

Section 2.

Page 19. Omit text after paragraph (b)

Substitute the following:

The adoption of minimum limits will save the time of city authorities in making elaborate studies and debating with interested parties the installation of signals at points where they are obviously not desirable. Where the volume exceeds the established minimum, the authorities should still examine carefully the characteristics of the vehicular and pedestrian traffic, including type of vehicle, speed, turning movements, and the physical conditions of the intersection. No signal should be installed unless there is a practical certainty that the delays or hazards will be less after installation than before. Where expedition of traffic rather than safety is the paramount consideration care must be taken in installing traffic control signals, because an unwise regulation will retard rather than expedite traffic. Some traffic control signals that are installed to control the peak traffic, such as exists at certain hours of the day, or on Sundays and holidays, should not be operated at other times when the volume of traffic does not warrant such control.

The foregoing discussion is based upon the use of the customary type of automatic control mechanism which provides continuously a regular, pre-arranged cycle. Obviously, such a fixed program for an independent signal will not always prove efficient in time utilization. Sometimes traffic on one street will be held when no traffic is using the "GO" interval on the other street.

The ideal condition would be for the signal to change in exact accord with traffic demands from minute to minute. If traffic on one street is approaching the signalized intersection and no traffic is using or about to use a "GO" interval on the other street, the signal should change to give the "GO" indication to the approaching traffic.

To accomplish this result, types of control apparatus have been developed by which traffic approaching the intersection actuates the signal control mechanism. Such mechanisms are called 'traffic-actuated' controls.

On page (23) there is presented a discussion of the use of this type of control.

Page 20. Rec. 51 - Add new paragraph:

- (c) Mast Arm - Housing suspended from a mast arm projecting from the side of a pole.

Page 20. Recommendation 52. - Add new paragraph:

- (d) Traffic Actuated - Controlled by mechanism actuated by impulse derived from vehicle or pedestrian.

Page 21. Omit all text under title Classification. Substitute the following:

CLASSIFICATION OF TRAFFIC CONTROL SIGNALS

Traffic control systems are herein classified according to the character of the traffic movement resulting from the system rather than the type of apparatus employed.

Recommendation 53. - Types of Systems

Traffic control signals and signal systems shall be classified as follows:

(a) Flexible Progressive. All signals are so inter-related that the total time period at each intersection is the same, but the period may be varied to meet traffic conditions at each intersection, and in addition are designed to provide for the continuous movement of traffic after it has entered the system.

(b) Alternate. Adjacent signals or groups of signals show opposite colors in the same direction at the same time, thus allowing a measure of progressive movement.

(c) Simultaneous. All signals show the same color in the same direction simultaneously.

(d) Independent. A signal not interconnected with or related in its operation to any other signal.

Page 21. Omit paragraph under title Flexible Progressive System.

Substitute the following:

The flexible progressive system is the best for the coordination of signals along a single street and is the only one that is well adapted to the control of signals on a number of adjacent streets that form a district having similar traffic characteristics. The complete cycle of changes must be of the same time duration for all of the intersections, and all the signals must be kept in their proper time relation. There are several mechanical methods for accomplishing these results, those most commonly used being either the connection of all signals by synchronous motors to a master controller or the operation of all signals actuated from a common source of electric current. The former of these methods has a greater degree of flexibility because the total time period may be varied or the proportionate division of the time

period at any signal may be varied by simple adjustments at the master controller. However a fair degree of flexibility may be attained with the synchronous motor system by simple hand wheel adjustments at the timing controllers at each intersection. The flexible progressive system has the following advantages:

(1) It permits the continuous movement of traffic at approximately a predetermined speed on both through and cross streets.

(2) It discourages speeding, because it forces the driver of a vehicle to make frequent stops if he exceeds the speed determined for the system.

(3) It makes possible the adjustment of the timing of each signal to the variations in the flow of traffic at the particular intersection controlled by that signal.

(4) It permits modification of the cycle length throughout the system to adjust it to the differences in traffic conditions at different hours of the day.

Flexible Progressive System

Page 22. / Change title to Alternate System. Change first paragraph to read:

The alternate system is an adaptation of the simultaneous system obtained by so changing the wiring of adjacent signals or groups of signals that each signal or group as seen from the same direction shows the color having the meaning opposite to that conveyed by the adjacent signal or group. Under the conditions for which this system is satisfactory it has the following advantages.

Page 22. Change title to Simultaneous System. Change first line likewise.

Page 23. Above title Use of Colors, insert title and paragraph as follows:

TRAFFIC-ACTUATED CONTROL

Traffic-actuated control can be used for any independent signal, and is especially worthy of consideration at multiple intersections, at intersections with variable traffic, or where conflicting movements should be handled separately, if any signal control is warranted.

As traffic becomes heavier and more uniform on the intersecting streets, the advantages of the selective principle

of traffic-actuated control over fixed time signals are diminished.

Where properly used, traffic-actuated control mechanisms to a considerable extent eliminate objections to independent traffic control signals because unnecessary stops are reduced to a minimum and there is less tendency for traffic to avoid signalized intersections. The objection to twenty-four hour operation of signals is also removed by the minimizing of delays and thus the safety element of continuous operation is retained.

Applications of this method of control may also be made at points where pedestrians cross a heavy traffic stream, by providing push button controllers for their use.

Page 23. Above title Use of Colors insert new recommendation.

Recommendation 53 $\frac{1}{2}$. - Main Thoroughfare Traffic Control.

(a) Where traffic is controlled continuously for a considerable distance, each intersection of a main thoroughfare with a cross street shall be protected.

(b) If the traffic on the cross street is heavy, the protection shall be by traffic signal.

(c) If the traffic on the cross street is light the protection shall be by "STOP" sign. (See Rec. 11)

Under certain conditions it may be desirable to install traffic signals at intervals to break traffic into platoons and to insure effective progressive movement.

Page 23. After title Use of Colors insert

Recommendation 53-a. - Color System

The three-color system is recommended, as provided for in the Model Municipal Traffic Ordinance.

Page 23. Recommendation 54. Change first line to read:

(a) In a three-color system, the colors shall be displayed in the order, red, green and yellow

Omit last two sentences of notes.

Page 23. Recommendation 55. After paragraph (c) insert note

as follows:

The determination whether or not a vehicle can be safely stopped before entering an intersection after the appearance of a stop signal should be based upon normal braking distances as defined in the National Code on Brakes and Brake Testing.

Change (d) to read:

(d) Yellow alone shall not be used in traffic control systems as a special period for the turning of vehicles or the movement of pedestrians.

Omit paragraph after (d) and substitute the following:

Pedestrians, due to their much slower speed are often unable to complete their crossing of a street before the signal changes, causing either hazard to themselves or delay to vehicles.

Two distinct signal control methods dealing with this problem are in use.

One method is the allotment of a time interval for exclusive pedestrian use of the intersection. This may be necessary at some intersections where pedestrian movement in all directions is heavy especially if combined with heavy or complicated vehicular turns.

Various signal indications are being tried to signify the pedestrian period, as for instance, the use of a special color or the combination of yellow and red, as is now provided by State law in Massachusetts, whenever a pedestrian interval is used.

The second method of dealing with the problem of pedestrian crossings is based upon the principle of informing pedestrians when there is no longer time to cross the street before the signal indications change. Several means of giving pedestrians this information are possible. In Detroit a special pedestrian sign bearing the necessary instructions is lighted at the proper instant. In Pittsburgh when there is no longer time for the pedestrian to cross, the yellow lens is lighted with the green, after which the yellow appears alone to indicate the usual clearance period for vehicles.

Page 24. Recommendation 59 - Add phrase at end of (b)

while red is shown on regular signal to stop through traffic.

Page 24. Before Recommendation 60 insert title

General Specifications

Rec. 60 - add new paragraph

(f) The housing shall be painted such color as to contrast with the colors of the signal lights.

Substitute as follows:

(b) Near corner installations of four-way signals on posts or brackets on all corners are recommended

Four-way signals at each near corner are recommended for the following reasons:

1. Give the maximum information as to what is required.
2. Reduce to the minimum the possibility of obstruction to visibility.
3. Insure that at least one signal light is always readily seen by the vehicle operator.
4. A pedestrian on either cross walk always directly faces a signal light.
5. One standard location should be adopted for all signs and signals and that should be at the place where the order is to be obeyed.

Near-corner three-way signals, omitting the light toward the nearest building, and similarly located two-way signals faced in the direction of the traffic on the street are in use and are claimed to be less expensive than four-way installations although not so completely effective.

Far-corner installations with three, two, or one-way signals are claimed to afford better visibility than near-side locations for the driver stopped by them. However, far-corner signals are sometimes impossible of use because of physical layout and when used are at times obscured by other traffic.

Two-way signals, with faces at 90⁰ degrees and one-way signals are effective only when located on far corners.

The cable suspension of signals over the roadway has the following undesirable features: May be unsightly; difficult to maintain; may seriously interfere with fire fighting equipment; to avoid interference with high vehicles must be placed so high as to prevent operators of certain types of vehicles from directly seeing the signal when stopped at the intersection.

Signal lights on brackets on two diagonally opposite corners are undesirable for the following reasons: The signal is on the right of one driver and on the left of the driver on the other street;

The use of a long bracket may be avoided by using two diagonally opposite signals on posts but this installation would require four-way indications.

Post signals in the center of intersections form extremely dangerous obstructions and they interfere with making turns.

Pages 25-26. Recommendations 62, 63 and 64 omitted because consolidated in Recommendation 53 $\frac{1}{2}$.

Page 26. Omit title and paragraph Emergency Control.

" " Cycle Lengths and insert paragraph as explanatory text under Recommendation 66.

Page 26. Recommendation 66. Change title to Time Periods.

Change paragraphs to read:

(a) A total period of 40 to 80 seconds should be used for the control of ordinary traffic.

(b) Changes in total periods for rush hours may be advisable. Consequently timers (or controllers) should have flexibility of adjustment through a wide variation of time periods, or to meet other street conditions especially if centrally controlled.

Page 27. Recommendation 67. Change paragraphs to read:

(a) A wigwag signal with a swinging target and red light.

(b) A flashing light signal with two red lights in a horizontal line 30 inches apart, flashing alternately.

Section 3 - Street Traffic Markings

Page 28 - Recommendation 71 - Pavement Lines

Add to (k) Directional lines: "consisting of series of arrows in center of traffic lane."

Add new paragraphs:

"At all signal intersections and especially opposite safety zones."

"Warning of Approach to Railroad Crossing."

Page 29 - Recommendation 71 $\frac{1}{2}$ - Railroad Crossing Pavement Markings

Insert new recommendation:

"As a supplementary advance warning of approach to railway grade crossings on hard surface, heavily traveled highways where rail traffic is fast or frequent, pavement markings should be employed, using the standard form approved by the American Association of State Highway Officials."

Page 29 - Recommendation 72 - Curb Markings

Change color schedule as follows:

"Prohibited stopping Red
"Passenger zone (loading and unloading of passengers only) White
"Loading zone (passengers and material) Yellow
"Limited time parking Green"

"Note: This code is intended for use in places where there are frequent variations in the regulations in a comparatively short distance. Where a single regulation applies to a long distance, signs should be used instead of curb markings."

Page 32 - Recommendation 82 - Positions of Safety Zones

Change paragraphs to read:

(A) "Safety zones should be established at street-car stops where the traffic is heavy and where at least one adequate traffic lane is available between the safety zone and the street curb

(b) "Safety zones should be established in crosswalks on wide heavily traveled streets or at any hazardous intersection.

Change paragraph (c) to read:

(c)"Those used for street car stops shall be at least 4 feet wide, and shall be long enough to provide adequate access to car entrances for the number of cars ordinarily stopped at the zone at one time.

Add explanatory text:

"Because of the difference in widths of cars, no standard distance from the rail can be established. Platforms should be built to properly accommodate the narrowest car. If any cars are operated which would overhang the edge of the safety platform, warning of this fact should be given by a line marked at a safe clearance distance."