
THE AMERICAN ASSOCIATION
OF STATE HIGHWAY OFFICIALS

# Manual for Signing and Pavement Marking

*of the*

NATIONAL SYSTEM of
INTERSTATE and DEFENSE HIGHWAYS

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# THE AMERICAN ASSOCIATION *of* STATE HIGHWAY OFFICIALS MANUAL *for* Signing and Pavement Marking *of the* NATIONAL SYSTEM of INTERSTATE and DEFENSE HIGHWAYS

1961

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# OFFICIAL MARKER

# FOR

# NATIONAL SYSTEM OF INTERSTATE

*and*

# DEFENSE HIGHWAYS

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# *Introduction*

THE National System of Interstate and Defense Highways, referred to as the Interstate System and now under construction along the Nation's principal travel desire lines, was conceived and is being built primarily to provide rapid, convenient and safe travel between and through major traffic generating centers. Essential to the realization of these valuable benefits is a uniform system of highway signing and marking that will be fully adequate in an environment of high volume, high speed motor vehicle traffic on modern controlled access highways. For this reason, a new concept has been developed for signing the Interstate System.

**Interstate Signing Principles**

The design for signs of the Interstate System must be approached on the premise that the signing is primarily for the benefit and direction of drivers who are not familiar with the route or the area. Signs must contain messages appropriate to the needs of these drivers. The sign legend must be carefully selected and designed for easy reading and the signs themselves must be prominently and effectively displayed at the proper locations so that drivers will tend to react promptly, naturally and safely to the traffic and design conditions encountered.

Sign installations are an integral element of the Interstate highway facility, and, as such, must be planned concurrently with the development of location and geometric design. Plans for signing should be analyzed during the earliest stages of preliminary design. Neglect of the correlation of signing and design can result in physical layouts that are plagued with chronic operating difficulties.

The cost of an up-to-date, effective signing system is but a minute fraction of the total facility cost, and realistic provisions for sign installations commensurate with the superior traffic services of the Interstate Highway System ought always to be the primary objective. The difference in cost between mediocre and excellent signs is negligible. The specifications herein are

intended to provide adequate sign treatment for the Interstate Highway System.

**Official Responsibilities for Uniformity**

Signing the Interstate routes is the responsibility of the several State Highway Departments since all of the routes comprising the Interstate System are, or will be, official State highway sections. However, variations in signing practice from State to State would result in a confused traveling public. Therefore, it is essential that a system of uniform signing, based on the best current practice, be adopted and universally used on the Interstate System in all of the States and the District of Columbia. Section 12 of the Federal-Aid Highway Act of 1944 requires the concurrence of the Bureau of Public Roads in the signing of federal aid projects as a means of achieving the desired uniformity. The purpose of this manual is to implement this provision by setting forth the basis for the desirable and required uniformity of practice.

**Changes in Standards**

From time to time, as changes in the uniform signing and marking procedure may seem desirable, the Member Department, proposing such a change, shall refer the suggestion to the Executive Secretary of the Association for consideration by the Operating Committee on Traffic. The Committee on Traffic may authorize a limited amount of research and experimentation on proposed changes in the official signing procedure, and bring the recommendations of the Traffic Committee to the attention of the Executive Committee. The Executive Committee then may authorize that the proposal be submitted to the Member Departments for letter ballot. If approved by two-thirds of the Member Departments and concurred in by the Bureau of Public Roads, then the proposed addition or alteration to the established uniform signing practice for the Interstate System shall be put into effect in all of the States. If the change revises an existing practice, the individual Member Departments may delay the actual application of the new practice until they find it necessary to renew affected signing in place.

**Application of Standards**

The Interstate highway signs will be erected at the roadside and, where warranted, over the roadway, to furnish drivers with

the series of clear instructions necessary for orderly progress to their destinations. Highway routes, place names, mileage indications, service facilities, and operating rules are among the items of information that must, in accordance with local needs, be unmistakably identified. It is also desirable that signs giving information regarding police headquarters, airports, recreational areas, historical sites, "anti-littering" warnings, time zones, defense installations, stream names and State welcome messages be used.

Existing free roads and toll roads incorporated in the Interstate System are not required to comply with these uniform sign specifications until major sign replacements are necessary. Sections of such highways that are reconstructed with federal aid and any sections of the Interstate System that are constructed as federal aid projects shall be signed in accordance with these uniform signing standards and federal funds may be claimed for the purpose as a construction reimbursement in accordance with controlling rules and regulations.

Other needed signs, not referred to in detail in this manual, shall follow the general provisions for Interstate signing set forth in this manual and conform to appropriate color, reflectorization, letter size and type. No other signs except those in general conformance with those described are to be erected within the Interstate System rights of way. References herein to the Manual on Uniform Traffic Control Devices are to the 1961 edition prepared and approved by the American Association of State Highway Officials, the Institute of Traffic Engineers, the National Committee on Uniform Traffic Laws and Ordinances, the National Association of County Officials, and the American Municipal Association, and concurred in by the Federal Highway Administrator.

## GENERAL CHARACTERISTICS OF INTERSTATE HIGHWAY SIGNING

It is of fundamental importance that the concepts applicable to Interstate highway signing be developed into a planned system of installations. Competent engineering study will be necessary for proper solution of the problems of many individual locations, and often involves consideration of an entire route. The common fault of oversigning found on many major highways usually involves a multitude of signs too small and too poorly designed and placed to accomplish the purpose intended. The incomprehensible sign maze must be avoided.

One of the advantages of controlled access design is that entrance and exit points are clearly defined and preserved, which make possible the determination of sign location to the degree that substantial permanent supporting structures can be constructed and utilized for maximum efficiency and economy.

With respect to sign letter size, the standards here prescribed are the same for both urban and rural areas. Space is often at a premium on urban sections, but the typical traffic pattern is also more complex for the driver to negotiate, and large easy-to-read copy is just as necessary as on rural highways. The lower speeds characteristic of urban operation may well support consideration of different design speeds for establishing urban highway geometrics, but do not as logically justify different sign standards.

### Messages and Sign Displays

The course of the Interstate route and the destinations along it must be clearly identified. A major purpose of the Interstate System is to offer superior service to population centers located on it. Therefore, an exit sign or other guide signs indicating a route diverging from the Interstate System must not be posted with any of the same destination names as are shown at that point for the Interstate route. Marking alternate routes to the same terminal city violates the purpose of the Interstate System.

Because of the need for full-time effectiveness, all Interstate highway signs shall be either reflectorized or illuminated, or possibly both, depending upon conditions. Particularly for major overhead installations where difficult conditions exist for viewing

a sign display, illumination will be the indicated solution. Signs of various types shall be identified by distinctive colors and shapes.

Specific values are presented for minimum horizontal and vertical clearances that are applicable to all signing. However, the positioning of major signs requires special attention so that they will suitably fit the local alinement and sight distance conditions, consistent with the general requirements of this manual.

**Overhead Sign Installations**

The operational requirements of the Interstate Highway System are such that overhead signs will be warranted at many important locations. An existing structure will occasionally serve for the support of overhead signs, and under some circumstances, may be the only practical location that will provide adequate viewing distance. On an urban freeway where overhead crossings are closely spaced, for example, it may be feasible to place some signs on the bridges. As a general rule, however, the esthetic values of well designed bridges should not be impaired by using them as sign structures.

The factors justifying the erection of overhead sign displays are not definable in specific numerical terms, but the following conditions, ranked in the order of their importance, deserve consideration:

1. Traffic volume at or near capacity
2. Complex interchange design
3. Four lanes in each direction
4. Restricted sight distance
5. Closely spaced interchanges
6. Three lanes in each direction
7. Large percentage of trucks
8. Background of street lighting and advertising signs
9. High speed of traffic

The intent is that these factors are among those to be satisfied in any decisions to erect overhead signs. The mere existence of any one or two of the conditions listed does not automatically justify the use of signs overhead. Rather, overhead signs have application in lieu of or as an adjunct to ground signs when competent engineering study indicates beyond any doubt that they

are needed. Insufficient space for ground signs is an important criterion, as is the special problem created by the junction of two Interstate highway routes, especially since two or more lanes on the exit roadways are often involved. On the other hand, some of the elements listed above can be made less critical by careful attention to interchange design.

**Sign Lettering and Spacing**

All names of places and highways on guide signs shall be composed of lower-case letters with initial capital or upper-case letters. The initial capital letters shall be 1⅓ times the "loop" height of the lower-case letters. Other legend on guide signs shall be in capital letters.

A suitable design for the lower-case alphabet is available to highway departments and sign manufacturers from the U. S. Bureau of Public Roads. It is intended that the initial capital letters (and numerals) used with this alphabet will be series E of the Standard Alphabets for Highway Signs (available from the Bureau) modified by widening the stroke-width to approximately one-fifth the letter (or numeral) height. Tables of recommended letter spacing can also be obtained from the Bureau of Public Roads, Washington 25, D. C.

Regulatory and warning signs shall use the Bureau of Public Roads standard rounded capital letter alphabets as prescribed in the Manual on Uniform Traffic Control Devices.

With all Interstate highway signs the message dimensions shall be determined first, and the overall sign dimensions secondarily. In this determination the interline spacing between tops and bottoms of capital or upper-case letters shall be approximately three-fourths of the average of the heights of the capital or upper-case letters in adjacent lines of letters.

The spacing to the top and bottom borders shall be approximately equal to the average of the letter height of the adjacent lines of letters. The lateral spacing to the vertical borders shall be essentially the same as the height of the largest letters.

On the major guide signs required for the Interstate system, the use of removable copy contributes materially to simple maintenance and reconditioning, a most important factor in long-range operation.

**Sign Borders**

Every sign shall be designed with a border of the same color as

the legend, to outline its distinctive shape and thereby make it more easily recognized, and to give it a finished appearance. For guide signs larger than approximately 6 feet by 10 feet the border shall have a width of approximately 2 inches, and on unusually large signs, a width of approximately 3 inches may be used. For guide signs smaller than 6 feet by 10 feet, a width of approximately 1½ inches may be used, but the width should not generally exceed the stroke width of the major lettering on the sign.

Corner radii of sign borders generally shall be approximately one-eighth of the minimum dimension on guide signs, except that the radii shall not exceed 12 inches on any sign. The sign area outside the corner radius need not be trimmed.

On regulatory and warning signs, borders should be widened in proportion to the enlargement of the general dimensions, as set forth in the Manual on Uniform Traffic Control Devices.

**Color, Reflectorization, and Illumination**

All guide signs on the Interstate Highway System except route markers, signs for service and rest areas, and certain informational signs such as those used at State lines, and special blank-out signs shall have white letters, symbols, and borders on a green background. Route markers shall have their standard colors, **and for the U. S. Highway System, shall have a black legend on a white background.**

Signs for service and rest areas shall have white reflectorized letters, symbols, and borders on a reflectorized or opaque blue background.

All warning and regulatory signs shall conform to the standard Interstate colors prescribed in this manual. Pending the availability of scientifically defined color standards, the four insert color sheets of this manual are to be classed as visual guides, rather than exact color standards for determining the yellow, green, red and blue for Interstate signs. It has not been possible for all producers to meet exactly the green and blue colors of the color sheets. Minor variations in matching the shade in natural daylight of the green and blue of the color plates in the Manual will be permitted, pending the establishment of a scientific standard for these colors, the tolerance ranges, specifications for gloss, brightness contrast, reflectance, and similar characteristics of the finished colored sign surface. Federal standards exist for the yellow and red colors of the color plates, and the

standards for these colors have been and should be met with little or no variation.

White letters, symbols, and borders shall be reflectorized except where the signs are independently illuminated, in which case the decision as to reflectorization should consider the likelihood of power interruption or other lighting failure. Where white or yellow sign backgrounds are employed, these shall be reflectorized or illuminated.

For roadside guide signs with white letters the green background may be reflectorized or nonreflectorized, though on any particular route within an individual State a uniform policy should be followed.

On overhead signs that are not independently illuminated the background as well as the legend shall be reflectorized.

For reflectorizing sign backgrounds, either reflective sheeting or the direct process of glass beads on paint will be acceptable.

Signs at remote locations on the Interstate Highway System may be difficult to reach with power. Where traffic volumes are light and there is no serious interference from extraneous light sources, a reflectorized sign will usually be adequate. However, if an engineering study of the conditions, particularly at overhead locations, indicates that a reflectorized installation is not likely to give effective performance, an illuminated sign will be required.

Experience with incandescent lamp sources for sign illumination has not been altogether satisfactory. Short life, and sensitivity to voltage surges and vibrations are among the difficulties. Tube lighting, especially the rapid-start type of fluorescent lighting, is effective and is recommended and will serve most needs, either for exterior or interior illumination of the sign. With the fixtures now commercially available, exterior lighting is feasible from a position in front of the bottom edge of the sign. The light source should be placed parallel to the sign face at a distance of $\frac{1}{3}$ to $\frac{1}{2}$ the vertical dimension of the sign, and so aimed that from the driver's position the sign surface appears to be uniformly illuminated. Illumination from below avoids undesirable daytime shadows on the face of the sign.

Internally illuminated signs using translucent materials are very effective and may justify consideration in some installations. Where internal illumination is used, the colors of the sign shall appear essentially the same by night and by day.

**Destination Messages**

On major guide signs not more than two destination names shall be shown. Additional copy, not ordinarily exceeding two lines, may include route numbers, arrows, cardinal directions, and exit instructions. This limitation applies to both ground and overhead installations. Two destinations and the directional copy are as much as most drivers will be able to comprehend readily at many points along the Interstate Highway System. Where two or more signs are included in the same display, extra effort should be made to reduce and simplify the amount of legend.

The use of population figures on exit guide signs presents a number of continuing difficulties and should be avoided.

Numbering of exits or interchanges has value in some situations. Where used, exit numbering should be from south to north and from west to east.

**Use of Arrows**

Arrow aiming is important. On all signs used to direct traffic into an exit roadway from the main traffic lanes the arrows shall point upward at an angle to fit the alinement as well as possible. Through traffic messages on ground signs will be directed by upward-pointing arrows, usually, but not necessarily, vertical. Down arrows shall be used only on overhead signs, and will designate the lane or lanes for the specific routes or destinations shown on such signs.

**Vertical and Horizontal Clearances**

In ground installations, directional signs shall be erected at a minimum height of 7 feet above the edge of the pavement to the bottom of the sign. If, however, a secondary sign is mounted below another sign, the major sign shall be at least 8 feet and the secondary sign at least 4 feet above the level of the pavement edge. All route markers, and warning and regulatory signs shall be at least 6 feet above the level of the pavement edge.

Overhead signs shall provide a vertical clearance of not less than 17 feet over the entire width of the pavement and shoulders.

The minimum horizontal clearance to any ground sign or overhead sign structure shall be 2 feet beyond the edge of the roadway shoulder, to either the right or left. Where there is an unmountable curb, the horizontal clearance shall be at least 2 feet beyond the face of the curb. For overhead sign supports,

guardrail protection shall be installed approximately at the edge of the shoulder. Similar guardrail protection may be necessary on some ground sign installations.

## SIGNING FOR INTERCHANGES

The major signs at interchanges and on their approaches are of three general types; advance guide signs, exit direction signs, and gore signs.

The advance guide sign notifies the driver well in advance of the intersecting route (or routes) and the principal destinations served by the next interchange and the distance to that interchange. Use of one or more advance guide signs on the Interstate route approaches to interchanges is prescribed in detail later.

The exit direction sign repeats the route and destination information displayed on the advance guide sign and provides drivers with more specific information concerning the action they should take to reach the interchange exit. For any given exit, no more than one exit direction sign, located on the immediate approach to the interchange, is used. Conditions described later in the text may justify omission of this sign.

The gore sign is erected at the point of departure, where drivers leave the through traffic lanes. Depending upon the defined conditions, the gore sign carries the word "Exit," or repeats route and destination information previously displayed to the driver on the advance guide signs and the exit direction sign.

### Interchange Signing Layouts

Included as a part of this Manual are sketches showing the principal guide signs required on the Interstate Highway System, and a few of the regulatory signs. Of chief importance are the illustrations of signing layouts at several typical interchanges on an Interstate highway.

The illustrations are intended only to be reasonably representative and will not satisfy the needs of all design situations. Where circumstances not described are met, it is intended that the basic principles cited be followed as closely as possible to preserve uniformity throughout the Interstate System.

Interchange design and spacing is so varied that thorough engineering study must be given to signing needs during the early stages of design. In most of the interchange diagrams in

this Manual, signs are shown only for two directions of traffic, it being assumed that signs for the other directions will be essentially similar.

The typical interchanges shown include:

1. An interchange of two interstate routes, which would rank in the major category. For clarity, Figure 1 shows only the principal signs required on each of the three approaches. Down arrows are placed on the gore signs since there is no exit movement from the Interstate System.
2. A "clover-leaf" interchange in the intermediate class, with two exit roadways for each direction of travel. The two exits are closely adjacent, as Figure 2 shows, and have common advance guide signs. This condition requires careful design and placement of signs to avoid confusing the driver in his selection of the proper exit, for the desired destination.
3. A "diamond" interchange in a rural area with but one exit roadway for each direction of travel on the Interstate highway. See Figure 3. The sign encircled with a dashed line carries the "Right Lane" message, and sometimes can be used effectively in place of the Exit Direction sign with the arrow. Occasionally, both will be required.
4. An "urban" interchange with a city street. See Figure 4. Here the interchanges are closely spaced and long-distance advance signing is not feasible. Street names become of principal interest. Note also the use of a "STOP AHEAD" sign in place of the "EXIT SPEED—MPH" sign.
5. The successive diamond interchanges, shown in Figure 5, are spaced so tightly together that the through lane message at the first provides the advance signing for the second. The principle is the same as for the cloverleaf interchange in Figure 2. When there are a series of such interchanges at close spacing, the interchange sequence signs shown in Figure 6 can be placed approximately midway between interchanges to give drivers the necessary orientation.

**Advance Guide Signs**

*Interchange Classification and General Requirements*

For purposes of advance signing, interchanges shall be classed as major, intermediate or minor; depending upon the following conditions:

Major interchanges are to include interchanges with other Interstate highways and with all other freeways and toll roads. They also include interchanges with other routes of significance for interstate drivers, such as high volume multilane highways, principal urban arterials, and major primary rural routes where the interchanging traffic is heavy or includes many drivers unfamiliar with the area.

Intermediate interchanges are to include interchanges with typical urban and rural routes, excepting those in the category of major or minor, as defined.

Minor interchanges are limited to those where traffic is very light and almost entirely local such as interchanges with isolated land service roads in the west. Where all exit volumes are estimated to be lower than 100 vehicles per day in 1975, the interchange will be classed as minor.

In the efficient and safe operation of a freeway facility, it is essential that the driver turn off at the proper exit ramp without hesitation and without the inconvenience of going beyond his desired exit point. For these reasons, two advance guide signs are desirable.

It is intended that the full complement of signs indicated will be installed at all "major" interchanges. In urban areas, however, and at times in high population density rural areas, the interchanges of this type may be so closely spaced as to make two advance guide sign installations not feasible, and under these conditions, one advance guide sign will be permitted. Interchange sequence signs, referred to later, are useful in orienting drivers when adequate space for two advance guide signs is not available.

At intermediate interchanges there shall be one or two advance guide signs depending upon specific conditions and the relative need for advance information. At minor interchanges there shall be at least one advance guide sign.

The display of the word "Exit" on the bottom line of the standard advance guide sign, along with the mileage to the exit point, is regarded as an essential component of the message to

be conveyed. It is not the intent that this word be omitted in urban areas or elsewhere.

In no case shall major guide signs placed in advance of the interchange deceleration lane be spaced closer together than 800 feet. To provide sufficient space for proper advance signing, and, in turn, proper operation, interchanges should not be less than one mile apart.

The term "Sign Installation" may include two signs opposite each other in roadside position, one at the left and one at the right of the pavement as a dual installation. This type of installation will be used for special emphasis only, where an overhead sign is not practical.

Subject to the conditions noted, the following advance signs shall be erected in the order shown:

*1. Advance Guide Sign for Major Interchanges* (See Figures 7 and 8)

At recommended distances of 1 and 2 miles from a major interchange, a sign shall be installed carrying three or four lines of legend as follows:

a. First line, with route marker or markers or name of intersecting highway or street. Numerals and cardinal directions should be in 18-inch capitals and the name of an intersecting street or highway should be in 20-inch upper-case and 15-inch loop height lower-case letters.

b. Intermediate lines with the name or names of not to exceed two destinations reached by turning at the interchange. The desirable size for destination names will be 24-inch upper-case and 18-inch loop height lower-case letters; the minimum letter size shall be 20-inch upper-case and 15-inch lower-case letters.

c. The last line shall read "Exit 1 Mile," or "Exit 2 Miles," as the case may be or refer to "Exits" instead of "Exit" if the interchange has two or more exit roadways. Letters shall be 12″ capitals. The numeral "2" shall be 18″ high. The distance posted may vary somewhat from the one and two miles indicated, if the actual distance between the sign and the interchange is markedly different. Fractions of a mile, rather than decimals, should be shown in these cases.

Where the distance between interchanges is less than two miles, this sign with an appropriate change in the distance

shown should be placed at the first available location with a suitable adjustment in the mileage shown.

*2. Advance Guide Sign for Intermediate Interchanges* (See Figure 9)

The advance guide sign or signs installed at intermediate interchanges shall be identical in design with the sign for major interchanges except for size. As previously indicated, the sign location may be adjusted for conditions and the interchange spacing, subject only to the minimum allowable distance of 800 feet between the Advance Guide Sign and the Exit Direction Sign. Legend components shall be as follows:

a. First line—Numerals and cardinal directions shall be in 15-inch capitals and the name of an intersecting street or highway shall be in 16-inch upper-case and 12-inch loop height lower-case letters.
b. Destination Names—The desirable size will be 20-inch upper-case and 15-inch loop height lower-case letters and the minimum size shall be 16-inch upper-case and 12-inch lower-case letters.
c. Last line—10-inch capital letters and 15-inch numerals.

*3. Advance Guide Signs for Minor Interchanges*

This sign is placed one-quarter to one-half mile from the gore. If an additional advance sign is necessary, the usual plan specified for advance guide signs at intermediate interchanges shall be followed. The sign is similar to other advance guide signs except that the last line shall read "Right Lane" and the sizes are as follows:

a. First line—Numerals and cardinal directions shall be 12-inch capitals and street or highway names shall be 13.3-inch upper-case and 10-inch loop height lower-case letters.
b. Destination Names—The desirable size is 16-inch upper case and 12-inch loop height lower case and the minimum size shall be 13.3-inch upper case and 10-inch lower case.
c. Last line—8-inch capital letters.

The foregoing letter-size specifications apply to ground installations of advance guide signs.

*4. Overhead Advance Guide Signs*

Conditions may indicate the use of an overhead advance guide sign, in which case the following sizes of legend components shall be used:

12″ Route numbers or 16″ upper case and 12″ lower case for street or highway names.

Destination names—12″ lower-case loop heights and 16″ capitals.

Exit Information—10″ capitals and 10″ numerals to indicate distance.

These prescribed letter heights for the main component of overhead sign legends are not subject to reduction because of excessive length of destination names or messages.

A recent study of a large sample of typical place names showed that four-fifths of them could be displayed in the prescribed letter size and accommodated in a horizontal distance approximately equivalent to one lane width. Only five percent of the place names will need more than a few feet additional. It is intended, therefore, that the main element of overhead guide sign messages have the prescribed 12-inch lower-case and 16-inch capital letters.

Double-decked facilities and other structures may present difficulties for the installing or viewing of overhead signs designed to Interstate requirements but these should be considered for solution during the design stage. In exceptionally difficult situations, where the standard requirements cannot be met, as would be in the case with sight obstructions created by earlier major construction, a reduced letter height may be used, but it is intended that the completed overhead sign installations at such locations have an effectiveness as nearly comparable with that normally achieved with the Interstate standards as possible.

Fractions instead of decimals to indicate distance shall be used if pertinent. Where length permits, the route number and destination may be combined in a single line using the letter sizes specified above.

All place names shall be in upper-lower case legend. Other legend shall be in capital letters.

Any special overhead signing that may be needed to sign complex interchanges or special locations shall follow the general principles for overhead signs set forth in this manual and conform to the green background color, reflectorization and/or illumination requirement, letter size, letter type and arrow type aiming as specified.

*5. Next Exit Sign* (See Figure 10)

Where the distance to the next interchange beyond the one for

which the advance guide sign is posted exceeds 5 miles, and a driver failing to make a desired turn would be required to travel a number of miles out of his way it may be desirable to use a supplementary panel mounted below the advance guide sign. This will carry the legend "Next Exit . . . Miles." Where two advance guide signs are used, the sign shall be placed below the one nearer the interchange. The legend on this sign shall be in capital letters 10 inches high, and the colors shall be the same as the sign it supplements. Where desirable, the "Next Exit" sign may be used when the distance between successive interchanges is less than 5 miles.

If the NEXT EXIT sign is erected separately or beneath a sign at least 16 feet in its horizontal dimension, the message may be displayed in one line. In other cases, the two-line design shown in Figure 10 shall apply.

**Exit Direction Signs** (See Figures 11 and 12)

Where only one advance guide sign is used and where the gore sign is ground mounted, an exit direction sign shall be installed between the advance guide sign and the gore sign to advise drivers of the exit maneuver. This sign may be placed at the beginning of the deceleration lane if the distance to the gore is at least 500 feet. Where the deceleration lane is shorter, the exit direction sign should be located well in advance of the deceleration lane, usually one-fourth to one-half mile in advance of the gore. In all cases the exit direction sign should be sufficiently in advance of the gore so as to present the sign series in a systematic way. Only in rare cases should it be within 500 feet of the gore.

This sign shall repeat the route and destination information of the advance guide sign with route numbers in 12-inch numerals and destination or street names in 16-inch upper-case and 12-inch loop height lower-case letters. When the sign is located at or near the beginning of the deceleration lane and the alinement of the exit ramp is so conspicuous that an arrow symbol will be readily associated with the departure point and ramp alinement, the last line of the sign should be an upward pointing directional arrow appropriately inclined for the exit roadway alinement. When these conditions are not met or when the sign is located well in advance of the beginning of the deceleration lane, the directional word message "Right Lane" (or "Left

Lane") in 12-inch capital letters shall be used in place of the directional arrow.

When at least two advance guide signs are used and the gore sign is an overhead installation, the exit direction sign should usually be omitted. However, if the exit direction sign is used where there are two exit roadways at the interchange, the sign shall carry only the message that is appropriate for the first exit, along with the words "Right Lane" or an arrow, as previously described.

**Gore Signs** (See Figures 13, 14, 15, 16)

When there is only a single exit at an interchange the interchange signs described above should enable the driver to decide whether he will turn or proceed straight through when he reaches the exit roadway. All that is necessary at the actual gore, in this case, is a sign to indicate the turning point. In the gore, therefore, there shall be placed a sign with the single word "Exit" in 12″ capital letters, and an arrow pointing in the proper direction. Thus the driver receives no reminder or new information that might cause him to react suddenly and dangerously.

At minor interchanges, the word "Exit" may be in a minimum of 8″ capital letters; however, it is desirable that the 12″ size be used.

Where the distance between interchanges is short, it may be necessary to place advance signing in the immediate vicinity of the previous interchange. In these unusual cases an overhead sign installation may be used to carry not only the gore sign with exit information and arrow but the advance guide sign for the next interchange.

When there is more than one exit, however, directional information shall be provided at all gores. An overhead sign installation shall be at the first gore, omitting the "Exit" sign otherwise to be placed at that point. This sign shall extend over the exit roadway and carry the route number or name, the direction, and the one destination, with an upward-sloping arrow pointing the direction of the exit traffic movement. At the same point, if the second exit is to the right, there shall be signs over the through lanes of the highway indicating, over the right-hand lane, the route and destination served by and distance to the second exit, with a vertically downward-pointing arrow. Over the left-hand lane or lanes the message "Thru Traffic" or a through message with not more than two destinations should

be displayed either with or without a downward-pointing arrow. The "Thru Traffic" shall be in 18" capitals. The other messages shall have 12" for route numerals, 16" upper case and 12" lower case for street or highway names and destinations, and 10" capitals and numerals for the exit information, or an arrow, as may be appropriate.

On the gore of the second exit there shall be placed a ground or overhead sign indicating the appropriate route and destination served, with an arrow pointing upward at an appropriate angle. The size of the lettering on this sign shall be equal to that of the first exit ramp sign.

The same general principles apply to any other interchange design that provides two or more exits for either direction of travel.

**Other Guide Signs** (See Figures 17, 18, 19 and 20)

It is sometimes necessary or desirable to provide more information regarding destinations accessible from an interchange than can be given on the standard interchange approach signs. For this purpose a supplemental guide sign installation listing up to two destinations followed by the legend "Next Right" or "Second Right," or both, as appropriate, may be erected approximately midway between the advance guide signs if two are used. If only one advance guide sign is used, the supplemental guide sign shall follow it by at least 800 feet.

If such a sign is used, the place names shall be in lower-case letters with a loop height of 10", with capital letters 13.3" high. It shall be of the same background color and reflectorization as other guide signs.

Where space between interchanges permits, a fixed sequence of signs shall be displayed beginning 500 feet beyond the end of the acceleration lane. At this starting point there shall be erected an Interstate route marker, to be followed 1,000 feet farther on by a speed limit indication, and 1,000 feet still farther along by a mileage sign. The last named sign shall carry no more than two lines of legend together with the corresponding mileage information. The legend should include either the next community or the next intersected highway name or route number on the top line, and the next point of general interest on the bottom line even though the place so selected might be in another State. Clear identification of each interchange is desirable, and a name may be used for the first line of this sign even when

there is no community present. Under normal conditions, mileages to the same destinations should not be shown more frequently than at five-mile intervals on mileage signs. The legend on the mileage sign shall be in lower-case letters of 10″ loop height, with initial capitals and numerals 13.3″ high.

Where space between interchanges does not permit placement of these three post-interchange signs without encroaching on or overlapping the advance guide signs necessary for the next interchange, one or more of the post-interchange signs should be omitted. Usually the mileage sign will be of less importance than the other two and therefore can be omitted with little or no disadvantage.

Where exits are very closely spaced for some distance particularly through large urban areas, interchange sequence signs displaying a maximum of three destinations and mileages or fractions thereof to the appropriate interchange serving such destinations may be used at suitable locations midway between interchanges. The legend on interchange sequence signs shall be in 10-inch lower case and 13.3-inch capitals or upper case, and fully consistent with the advance guide sign and exit sign legends. See Figure 19.

Some parts of the Interstate Highway System will pass through "historical" or "recreational" regions, or urban areas served by a succession of several interchanges. Such areas may be indicated by a special sign several miles, if possible, in advance of the Advance Guide sign or signs for the first interchange carrying a suitable legend to identify the region, followed by the words "Next (3) Exits," or "Next (3) Interchanges" where appropriate. The legend shall be in lower-case letters of 10″ loop height with 13.3″ capitals or upper case, except the bottom line, which shall be in 12″ capitals. See Figure 20.

The commonly used name or trailblazer symbol for a toll facility may be displayed on free sections of the Interstate System at:

1. the point of last exit before entering a toll section of the Interstate System;
2. the interchange or connection with a toll facility, whether or not the toll facility is a part of the Interstate System; and
3. at other locations within a reasonable approach distance of toll facilities, when the name or trailblazer symbol for

the toll facility would provide better guidance to drivers unfamiliar with the area than would place names and route numbers.

As greater mileages of the entire Interstate System are opened to traffic, the need for identifying toll facilities for the purpose mentioned in (3) above is expected to diminish. In the interim, care should be exercised to avoid any use of toll road trailblazers and names that might interfere with an adequate public understanding that Interstate highways comprise a continuous, integrated system of national significance.

The toll facility name or marker may be included as a part of the guide sign installations on intersecting highways and approach roads to indicate the interchange with a toll section of an Interstate highway. Where needed for the proper direction of traffic, a trailblazer for a toll facility that is part of the Interstate System may be displayed with the Interstate trailblazer assembly described under "Route Markers".

Other miscellaneous guide signs that may be used include State, county, or township lines, international time zone boundaries, important stream names, etc. Place names as well as stream names shall be 8-inch upper-case and 6-inch loop height lower-case letters. Generic words such as "township line" and "city limits" shall be 6-inch capital letters. On all such signs, the design should be simple and dignified, devoid of flamboyant advertising style, and in general conformance with other Interstate signing.

## ROUTE MARKERS

### Application

Route markers, as such, will have a less general application on the Interstate Highway System than on highways of older design. Large directional signs will incorporate the Interstate route marker symbol when appropriate. Route markers in conjunction with auxiliary markers to show junctions and turns will not ordinarily be used on the Interstate Highway System, though they will be used as required on approach highways. "Confirmatory" route markers, however, will be used at the prescribed location just beyond the entrances to Interstate highways, and at relatively long intervals along a route. Except for those specific uses and locations listed below, no Interstate Route

Marker shall appear on any road or street that is not a part of the designated official Interstate System. Its use off the system to indicate business routes, alternate routes, etc., shall not be permitted. The official Route Marker will indicate to the motorist that he is using a controlled access facility and a section of the official Interstate Highway System.

**General Design Provisions** (See Figures 21 and 22)

The official Interstate Route Marker is the red, white, and blue reflectorized distinctive shield adopted by AASHO on August 14, 1957, and subsequently approved by the U. S. Department of Commerce, Bureau of Public Roads. The colors shall match the Standard Interstate Red and Blue Colors as contained in this manual when compared in natural daylight. The Route Marker shall comply with the dimensional drawings and specifications as contained in this manual. Two general proportions are prescribed; one to accommodate route numbers with one or two digits, and another for markers with three digits or with two digits and suffix letter. Nominal sizes for independent mounting are 18 inches for trail blazers, 24″ for intersecting routes and 36 inches for confirmatory markers on the Interstate System itself. Where the Interstate marker is displayed in an assembly or on the face of a guide sign with US or State route markers, it should be at least equal in legibility to these other route markers. The standard designs for route markers used independently, and on guide signs are shown in Figures 21 and 22, respectively.

**Trail Blazer Installations**

The 18″ Interstate shield shall be used with an appropriately positioned directional arrow and the word "TO" to make up a "Trail Blazer Assembly" to direct traffic to the Interstate facility. The use will be primarily in the urban centers and at strategic locations along major urban throughfares feeding traffic to the Interstate facility. The use of the word "TO" indicates that the road or street, where the marker is posted, is not a part of the official Interstate System, but that the motorist is merely being directed progressively to the Interstate route.

The word "TO" (in 6″ black upper-case letters on a white background), a cardinal direction marker if needed, the 18″ Interstate shield and the directional arrow may all be separate units and connected to the same support and positioned from

top to bottom in the above order, with the directional arrow complying with Manual on Uniform Traffic Control Devices, or all component parts of the "Trail Blazer Assembly" may be included on a single panel. The directional arrow should be appropriately positioned to indicate the direction to the route and should be black against a white background.

**Use on Intersecting Routes and the Interstate System**

The 24" Interstate Route Marker shall be used on intersecting highways and approach roads to indicate the interchange with an Interstate route.

The 36" marker shall be the official size to mark the Interstate System roadways.

The Interstate Route Marker will be used independently or in a route marker assembly for confirming the route, and shall be displayed on Advance Guide and Exit Signs to indicate an interchange with another Interstate route. When the route marker is used on the face of a guide sign, the State name shall be omitted, but otherwise it shall be reflectorized and in its approved colors.

The 36" Interstate marker shall be used on Guide Signs using 12" lower-case letters for place names. Where the sign message employs larger copy, appropriate increase should be made in the size of the Interstate Route Marker.

**Cardinal Direction Marker**

Cardinal Direction Markers shall be used with route markers where needed to direct the motorist properly. They shall be mounted directly above the Route Marker, except where an Interstate marker is displayed as part of a guide or exit sign. In the latter case, the cardinal direction will be a part of the sign message, but preferably will appear above or to the right of the route marker to which it applies.

The Cardinal Direction Marker shall have a reflectorized white legend and border on a blue reflectorized background which conforms to the Standard Interstate Blue of the Interstate Route Marker.

The Cardinal Direction Marker shall be used in two sizes, 18 by 9 inch with the 24-inch route marker and 30 by 15 inch with the 36-inch route marker.

The 18 by 9-inch size should have a $\frac{3}{8}$-inch white border extending to the outer edge and 4-inch Series "D" Letters. The

30 by 15-inch size shall have a ½-inch border and 7-inch Series "C" Letters.

Cardinal Direction Markers will carry the direction only, i.e., NORTH, SOUTH, EAST, or WEST, as the case may be in accordance with the Manual on Uniform Traffic Control Devices.

Junction and Directional Markers, as provided for in the Manual on Uniform Traffic Control Devices, shall be used with Interstate Route Markers on the approaches to Interstate routes.

**Off Interstate Route Marker** (See Figure 23)

This marker is designed to be used on a major highway that is not a part of the Interstate System, but one that is wholly adequate to serve the business area of the city from interchanges on the Interstate system. The Marker will carry the Interstate Route Number and will be reflectorized with white legend, numerals and borders on a Standard Interstate Green Color background.

It will be used in addition to such other route markers as may apply to the particular highway used as the business route. Where traffic can leave the Interstate Route at an Interchange on one side of the bypassed city and re-enter it at an interchange on the other, the word "Loop" will be used. Where the business traffic goes into the bypassed city and back to the Interstate Route over a single road and through the same interchange the word "Spur" should be used.

In no instance is the word "Interstate" to appear on this marker, as this designation is reserved solely for the official Interstate System.

When this marker appears on an advance exit guide sign on the Interstate System to indicate an exit to the "Business Route," the size of the marker shall be consistent with others on the same sign. In all other places, the 24" marker shall be used.

Dimensions, letter and numeral series are to comply with those of the official Interstate Marker.

The off-Interstate route marker shall not be used to mark a Frontage Road.

**Marking of Overlapping Routes** (See Figures 24 and 25)

On those sections where the Interstate System is developed over an existing U.S. numbered route, both the U.S. and the Interstate system shields and route numbers shall be used to mark those sections which are coincident. Otherwise, it is assumed that in the majority of instances the U.S. markers and

numbers will remain on the routes now established or on locations determined by subsequent Executive Committee action, as new construction makes available new and better routes.

To assure an adequately balanced display in the many instances where Interstate and U.S. route markers will be mounted in the same assembly, the standard dimensions for U.S. route markers shown in Figures 24 and 25 are to apply.

The use of route markers other than those for the Interstate System will normally be restricted to markers for U. S. and State routes officially employed for the guidance of traffic in accordance with the "Purpose and Policy" statement of the American Association of State Highway Officials, dated January 1, 1959, which applies to Interstate and U. S. numbered routes. However, the marking of unnumbered routes having major importance to the proper guidance of Interstate traffic because of their names, such as the Great River Road which follows the entire length of the Mississippi River, is permissible if carried out in general accordance with the methods prescribed in the aforementioned policy for U. S. numbered routes.

When U. S., State, or other route markers appear on the face of Interstate guide signs, their colors shall be the same as when used elsewhere in separate installations, viz., black legend on a white background for U. S. route markers and for most State route markers. Use of white legends and green backgrounds on route markers is limited to the Off-Interstate System Business Loop (or Spur) route marker.

### Signing Interstate Routes as Memorial Highways

Interstate routes are not to be signed as memorial highways. This provision does not prohibit the erection and maintenance of memorial plaques indicating the highway is a Blue Star Memorial Highway, if such plaques are placed in rest and recreational areas within or adjacent to the right-of-way of Interstate highways which have been designated by State Law as Blue Star Memorial Highways and for the identification of which the erection of memorial plaques is authorized by State law.

## REST AREAS

On extended mileages of controlled-access highways, it will be necessary to provide "rest areas" at reasonable intervals, where private car and commercial vehicle drivers may leave the

roadway for rest and relaxation. For this purpose a guide sign shall be placed one mile or two miles in advance of the rest area. This sign shall read "Rest Area" in 16-inch capital letters, with a second line reading "1 (or 2) Miles" in a 16-inch numeral and 12-inch capital letters, as in Figure 26.

Between the advance guide sign and the gore of the rest area exit, there shall be an exit direction sign. This sign shall read "Rest Area" in 12-inch capital letters and shall have an arrow or a word message in the second line. The conditions for location of this sign and for determining whether to use the arrow or the word message are the same as those described in the section "Exit Direction Signs" under "Signing for Interchanges." (See page 22.)

In the gore at the rest area exit, there shall be a sign reading "Rest Area" in 12-inch capital letters with an arrow beneath indicating the appropriate turn. All signs for rest areas shall have reflectorized white letters, symbols and borders on a reflectorized or opaque blue background.

## SIGNING FOR SERVICES

On the controlled-access Interstate Highway System, it is assumed that generally there will be no commercial services available to the traveler between interchanges. It is expected that adequate fuel, motor services, food service and lodging will rapidly become available at most major interchange sites. It is also assumed that service signing will not be required in urban areas. However, on those rural sections where such services are infrequent, the driver will need information to enable him to plan his stops. For the present the criteria for determining what establishments shall warrant a Services sign will have to be developed by each State for its own conditions. A distance approximating one mile from the Interstate route is being used by some States as a reasonable range for identifying services.

Only services that adequately serve the needs of the Interstate motorist should be shown. Where the services are not within sight of the interchange, the State highway department may elect to repeat the service signing, in smaller size, on the intersecting highway with arrows indicating the direction to the services.

It is anticipated that the American Association of State Highway Officials will develop uniform and adequate standards for signing for services and warrants which facilities must meet, to be eligible for inclusion in such signing.

The Services sign shall be mounted in an effective location in advance of the exit leading to the services available and should contain such legend as may be appropriate. The directional legends "Next Right" or "Second Right" should be used in the same way as is prescribed for supplemental guide signs when appropriate. If the distance to the next point where services are available is considerable, a sign "Next Services Miles," shown in Figure 27, may be used as a separate panel mounted under the Exit Direction Sign near the beginning of the deceleration lane. The legend of this sign shall be in 10-inch capital letters.

More experience and study of motorist reactions and desires, as well as indication of where and what private enterprise develops to serve the traffic, are needed to determine the proper signing for essential services. In some locations, signs may be useful to indicate that services are not available.

A sign carrying only the legend "Food—Phone—Gas—Lodging" may not entirely satisfy the motorist in that it gives an incomplete notice of the location, quantity, quality, or brand of services available. It is not yet feasible to establish a detailed signing practice for motorists' services, but added experience should make this possible as more of the Interstate System is placed into service. It may be necessary, for example, to use more effective methods of advising Interstate highway users whether and at what distance the services identified on the signs are actually available to them. Information centers established at rest areas can help to provide this information. Federal law prohibits any signing that may be interpreted as commercial from occupying the Interstate right of way.

There has been considerable success with the standardization of service messages on a single sign. The services available are shown at specified locations on the sign, and the sign space normally reserved for a given service is left blank when that service is not present. This has the further advantage of flexibility for the future, when the service may become available. The standard display recommended is "Food" and "Phone" in that order on the top line and "Gas" and "Lodging" on the second line.

A separate telephone sign may be erected when telephone facilities are located adjacent to the Interstate route at places where telephones would not normally be expected. The color,

general design, location and use of the telephone sign shall conform with the provisions for service signs.

All signing for services shall have reflectorized white letters, symbols and border on a reflectorized or opaque blue background.

## MILEPOSTS

To assist drivers in estimating progress and in orienting himself for decisions that may be needed, to provide a means for identifying the location of emergency incidents, and to aid generally in the operation of the facility, mileposts shall be placed along each section of the Interstate Highway System. It is recommended that "Zero" mileage on the Interstate routes be at the south or west State lines and at junctions where routes begin, and that the mileage numbering be continuous within any State.

Signs shall be simple vertical panels, without border, of Standard Interstate Green Color background, with reflectorization optional, carrying white reflectorized mileage numerals in a 6-inch height. Mileposts shall be placed along both sides of the highway in line with delineators and the mileage displayed shall in each case be from the same origin. Where an interchange roadway or other interference prevents installing the milepost at its correct location, it may be moved in either direction as much as 50 feet. If it cannot be placed within that degree of accuracy, it should be omitted.

Mileposts shall be installed only after improvements on the Interstate System have progressed sufficiently to permit the posting of accurate mileage.

## REGULATORY AND WARNING SIGNS

Regulatory and warning signs on the Interstate Highway System shall be in general conformance with the established principles prescribed in the Manual on Uniform Traffic Control Devices. In all cases, the background shall be reflectorized or illuminated. Because of the greater demands for legible signing on the Interstate System, all regulatory and warning signs shall equal or exceed in their dimensions the minimum specifications of the standard Manual.

The diamond-shaped warning signs shall have a black legend and border on a yellow background, and shall be 48 by 48 inches

in size. The equilaterial triangular "YIELD" signs shall have black lettering and border on a yellow background and shall have a vertical measurement of 48 inches. The regulatory signs shall have a black legend and border on a white background and shall normally be 48 by 60 inches in size. For both types of signs the size of the lettering or symbol must determine the size of the sign. All legend shall be in capital letters and heavy enough to minimize the effects of halation. The yellow shade used for the diamond-shaped warning and the triangular "YIELD" signs shall match the Standard Interstate Yellow Color identified in this manual, when compared in natural daylight.

In addition to the standard sign messages specified in the Manual on Uniform Traffic Control Devices which will apply, other messages shall be used as required by the special design features of the Interstate Highway System. Pertinent regulatory and warning signs include, but are by no means limited to the following:

MERGING TRAFFIC. This warning sign (48 by 48 inches) is to be erected on the appropriate side of the through roadway of an Interstate route in advance of where another roadway enters.

KEEP OFF MEDIAN. This regulatory sign (48 by 60 inches) shall be erected within the median wherever there is a tendency for drivers to enter or cross, and at random intervals as required.

It is not contemplated that a No U Turn sign will be used in the median of the Interstate System except in special circumstances described later under "Median Crossovers."

EMERGENCY PARKING ONLY or EMERGENCY STOPPING ONLY. This regulatory sign shall be used at random intervals as needed. The legend shall be in 6″ Series D letters on a 48″ by 36″ sign. Figure 28 shows this sign.

SLOWER TRAFFIC KEEP RIGHT. This regulatory sign shall be used to the extent needed to maintain orderly use of lanes.

SPEED LIMIT. Speed limit regulatory signs shall be of standard design, normally 48 by 60 inches in dimension. However, the legend must be in accord with the respective State laws, and therefore cannot be prescribed in detail here.

YIELD. This regulatory sign is to be used on entrances to the Interstate System at locations where traffic engineering study indicates the sign will be conducive to safe and orderly merging entrance movement. Where full length acceleration lanes exist, the Yield sign will not normally be required.

EXIT (25) M.P.H. Where it is necessary to indicate a lower speed on an exit ramp the advisory exit speed sign shown in Figure 29 shall be used. It shall have a black legend and border on a yellow background, and shall be mounted on the right-hand side of the ramp roadway just beyond the gore. The speed actually indicated shall be the safe speed, as determined by the conditions at each individual location.

Where an additional advisory speed indication may be needed on the ramp well beyond the gore, the standard curve symbol and advisory speed sign combination prescribed in the Manual on Uniform Traffic Control Devices should also be used. If the intervening distance to a STOP sign or signal is short, the exit speed sign may be omitted in favor of a "STOP AHEAD" or a "SIGNAL AHEAD" sign at a suitable point on the ramp.

## SIGN STRUCTURES

The design of sign structures has been standardized by committees of the American Association of State Highway Officials and other agencies, and a "Specifications for the Design and Construction of Structural Supports for Highway Signs" is now available.[1] It is expected that economical standard designs will be developed to support overhead signs and that these structures will be readily available from various manufacturers. Catwalks on overhead sign structures to accommodate a repairman are often justified at those locations where signs cannot be adequately serviced from the shoulder area.

## MISCELLANEOUS SIGNING CONSIDERATIONS

### Signing Adjacent to the Interstate System

Adequate attention should be given to the matter of identifying entrances to the Interstate Highway System from roads of lesser importance. The standard arrangement of route markers, auxiliary junction and directional markers, and destination signs on the approach roads may be found ineffective for some of the more critical interchanges, in which case the Interstate highway signing standards may have to be extended to the approach roads.

[1] *Specifications for the Design and Construction of Structural Supports for Highway Signs, American Association of State Highway Officials, Washington, D. C.*

In general, however, the provisions of this Manual pertain only to the through traffic lanes and the interchange turning roadways of the Interstate System. Signing for frontage roads and for other interchange approach roads beyond the ramp terminals, which serve traffic not on the through traffic lanes and ramps of the Interstate system highways, shall conform with conventional signing practice in the respective States for those highways where the design, traffic needs and services provided are similar. Good judgment and careful attention to details of such signs and their locations must be exercised in the vicinity of ramp terminals to avoid giving the drivers on these roads confusing or conflicting information.

**Placement for Effective Viewing**

Improper placement of signs, either overhead or on the ground, will greatly weaken the effectiveness of an installation that is otherwise well planned. Sign faces shall always be oriented to avoid or minimize specular reflection, ordinarily by a slight turning away from the roadway. This adjustment should be made with care so as to maintain adequate reflective values.

On sections with fixed lighting, ground signs should be located properly in relation to the lamp standards to achieve the optimum position for clear viewing. This may be in advance of or beyond the standard depending on the conditions. Nighttime checks of sign installations are highly desirable.

**Sign Materials**

No fixed recommendations are offered as to sign materials. Plastic coated plywood, redwood tongue-and-groove, aluminum, steel, and other materials are being successfully used, and no general limiting specifications in this area seem desirable or necessary at this time.

## OTHER DETAILS OF SIGN DESIGN AND LOCATION

**Letter Height and Arrow Specifications**

Letter style and height, and arrow design have been standardized for the Interstate System to assure uniformly effective signing. The prescribed numeral and letter sizes for principal types of guide signs appear in Table 1. Other sign letter size requirements not specifically identified elsewhere in this Manual should be guided by these specifications.

The standard arrows for Interstate signs are illustrated in Figure 30. The "A" and "B" arrows are always upward pointing and the "C" arrow design is used exclusively on overhead signs and points downward only. The "A" arrow will be most commonly employed and is designed for vertical or diagonal placement alongside two or more lines of sign message. The "B" arrow is appropriate for single line messages. Dimensions of the "A" and "B" arrows are to vary with the letter style and height, as indicated by the tabulations on Figure 30. The "C" arrow is the standard design for all down arrows on signs located over the roadway.

**Individual Sign Designs**

It is the intent that there be general adherence to the prescribed horizontal and vertical sequences for route markers, cardinal directions, destination names, arrows, and other components of the sign display. The present standards offer the benefits of systemwide uniformity and contain provisions flexible enough for most signing problems.

Abbreviations on Interstate signs are to be kept to a minimum and in the case of cardinal directions used with route markers on major guide signs, the words NORTH, SOUTH, EAST, and WEST are not to be abbreviated. This has no application to branch routes such as 70 N or 70 S where the initial letter for the cardinal direction is an integral part of the route marker display.

No Stop sign or Stop signals of any type shall be erected or operated on the through roadways of the Interstate System.

Church, School, Civic Club, semi-official and similar signs shall not be placed on the Interstate right of way. Only official signs, under the direction and control of the State highway department and necessary for the orderly operation of the highway facility shall be installed on the Interstate System.

## PAVEMENT MARKING

All pavement markings within the limits of the Interstate System rights of way shall be reflectorized and in accordance with the approved Manual on Uniform Traffic Control Devices. Solid yellow shall be used for all barrier line applications and white for all other pavement marking, including continuous pavement edge marking in areas where fog conditions or other unusual hazards may be encountered, and adjacent to and for

several hundred feet on either side of structure piers, abutments, and retaining walls.

The practice of painting black stripes in the gap between the white dashes in a dashed white lane or center line is permissible but not required.

**Edge Marking**

When an edge marking is placed at the locations mentioned, it shall consist of a solid, unbroken white line along the outer edge or both edges of the main traveled portion of the roadway pavement. Where the pavement surfacing is extended over all or a part of the shoulder width, the edge marking is to be between the traffic lane and the shoulder area.

The intended functions of edge marking are to give the driver a continuous line of visual reference so that he will be efficient in guiding his vehicle, and to identify the boundary between the traveled way and the shoulder so that drivers will be discouraged from use of the shoulder area except in emergencies.

**Exit Ramp Marking** (See Figure 31)

A solid white line at least 8 inches in width shall be placed along the sides of the triangular neutral area between the edge of the main traffic lanes and the exit ramp lane at the gore of every exit ramp terminal. With parallel deceleration lanes a dashed white line shall be placed from the apex of the triangular area for a distance of approximately one-half the length of the full width deceleration lane. Where additional emphasis is desired, diagonal markings may be used within the neutral area.

**Entrance Ramp Marking** (See Figure 32)

A solid white line at least 8 inches in width shall be placed along the side of the triangular neutral area adjacent to the ramp lane at the gore of every entrance ramp terminal. With parallel acceleration lanes, a dashed white line shall be placed from the apex of the triangular area for a distance of approximately one-half the length of the full width acceleration lane. With tapered acceleration lanes a similar dashed white line may be placed beyond the solid line but not beyond the point where the tapered line meets the outer edge of the adjoining through lane.

# DELINEATORS

**Location and Application** (See Figure 33)

Delineators, on posts assembled and erected in such a manner that the top of the reflective unit is approximately 4 feet above the grade of the pavement edge, shall be placed continuously on all Interstate roadways, except on those sections between interchanges where fixed source lighting is installed and in operation. Delineation is to be installed on all roadways at all interchanges, whether or not the interchanges are lighted.

White reflector units shall mark the Interstate roadways and amber shall mark the interchange ramps and the acceleration and deceleration lanes. The amber units shall be double or elongated vertically, and at the end of the acceleration lane there shall be placed a triple or correspondingly elongated amber delineator. Along the through roadways the delineator spacing shall be approximately 200 feet (in case delineators are desired to be used as fractional mile markers a spacing of 264 feet will be acceptable) except that spacing through interchange areas may be reduced. The amber delineators at interchanges shall be spaced at a maximum of 100 feet. Interchange ramp design is sufficiently varied that no single delineator spacing can fit every situation, and the spacing values accepted for the Manual on Uniform Traffic Control Devices, which appear as Table 2, should be employed as a guide to delineator spacing on interchange roadways.

To be consistent with other lateral clearance provisions of this Manual relating to signs and supports of overhead and ground mounted sign structures, the delineators shall be placed along the right side of the through Interstate roadways, two feet beyond the outer edge of the roadway shoulder or the face of an unmountable curb, or in the line of the guard rail. At interchanges, delineators shall be located along the outside of the curve of turning roadways, i.e., on the left side for right curving ramps and on the right for others, but this does not preclude their use on both sides of the turning roadway where needed for clear indication of the alinement. On speed-change lanes, the delineators shall be installed on the right for right hand connections, and on the left for left hand connections.

**Design and Performance**

Glass or plastic prismatic reflective elements, plastic elements

with reflective sheeting sealed therein, or other reflective coatings used for delineator installations shall have a surface area sufficient to contain an inscribed circle not less than 3 inches in diameter. For multiple application (amber) elongated reflective units of appropriate length may be used in place of two or three circular units. The delineator reflector units shall be so positioned and of such a quality and type that they will be clearly visible for a distance of 1,000 feet during night time under normal weather and atmospheric conditions when illuminated by the upper beam of standard automobile headlights when the vehicle is located in the right hand traffic lane approaching the delineator.

**Median Crossover Delineation**

Where median crossovers are provided for official or emergency use and where these crossovers are to be marked, a double yellow delineator shall be placed on the left side of the through roadway on the far side of the crossover for each roadway. If State law requires a No U Turn sign at the crossover, a 36″ by 48″ sign should be placed parallel to the highway to avoid calling undue attention to the crossover.

TABLE 1 -- LETTER AND NUMERAL SIZES FOR PRINCIPAL INTERSTATE GUIDE SIGNS

### ADVANCE GUIDE SIGNS

| | |
|---|---|
| **Major Interchanges** | |
| Route numeral | 18" num. |
| Cardinal direction | 18" cap. |
| Street name | 15" l.c./20" u.c. |
| Destination names | |
| desirable | 18" l.c./24" u.c. |
| minimum | 15" l.c./20" u.c. |
| Exit--Miles | 12" cap.-18" num. |
| **Intermediate Interchanges** | |
| Route numeral | 15" num. |
| Cardinal direction | 15" cap. |
| Street name | 12" l.c./16" u.c. |
| Destination names | |
| desirable | 15" l.c./20" u.c. |
| minimum | 12" l.c./16" u.c. |
| Exit--Miles | 10" cap.-15" num. |
| **Minor Interchanges** | |
| Route numeral | 12" num. |
| Cardinal direction | 12" cap. |
| Street name | 10" l.c./13.3" u.c. |
| Destination names | |
| desirable | 12" l.c./16" u.c. |
| minimum | 10" l.c./13.3" u.c. |
| Right Lane | 8" cap. |
| **Overhead** | |
| Route numeral | 12" num. |
| Cardinal direction | 12" cap. |
| Street name | 12" l.c./16" u.c. |
| Destination names | 12" l.c./16" u.c. |
| Exit--Miles | 10" cap.-10" num. |

### SERVICE SIGNS

| | |
|---|---|
| (Basic) | |
| Type services | 10" cap. |
| Next Right | 10" cap. |
| (Alternate) | |
| Type services | 10" cap. |
| Next Right | 10" cap. |
| Type services | 10" cap. |
| Second Right | 10" cap. |
| (Secondary) | |
| Next Services | 10" cap. |
| --Miles | 10" cap. & num. |

### SUPPLEMENTAL GUIDE SIGNS

| | |
|---|---|
| (Basic) | |
| Destination names | 10" l.c./13.3" u.c. |
| Next Right | 10" cap. |
| (Alternate) | |
| Destination name | 10" l.c./13.3" u.c. |
| Next Right | 10" cap. |
| Destination name | 10" l.c./13.3" u.c. |
| Second Right | 10" cap. |

### NEXT EXIT SIGNS

| | |
|---|---|
| (Basic) | |
| Next Exit | 10" cap. |
| --Miles | 10" cap. & num. |
| (Alternate-Single Line) | |
| Next Exit--Miles | 10" cap. & num. |

### EXIT DIRECTION SIGNS

| | |
|---|---|
| (Basic) | |
| Route numeral | 12" num. |
| Cardinal direction | 12" cap. |
| Street name | 12" l.c./16" u.c. |
| Destination names | 12" l.c./16" u.c. |
| Right Lane | 12" cap. |
| (Alternate) | |
| Route numeral | 12" num. |
| Cardinal direction | 12" cap. |
| Street name | 12" l.c./16" u.c. |
| Destination names (with arrow) | 12" l.c./16" u.c. |

### GORE SIGNS

| | |
|---|---|
| Single Exit | |
| Exit (with arrow) | 12" cap.[1] |
| Multi-Exit and Closely Spaced Single Exits (Overhead). | |
| Ramp Lane[2] | |
| Route numeral | 12" num. |
| Cardinal direction | |
| Street name | 12" l.c./16" u.c. |
| Destination name (with arrow) | 12" l.c./16" u.c. |
| Right Lane | |
| Route numeral | 12" num. |
| Cardinal direction | 12" cap. |
| Street name | 12" l.c./16" u.c. |
| Destination | 12" l.c./16" u.c. |
| Exit--Miles (with arrow) | 10" cap. & num. |
| Left Lane | |
| Thru Traffic (with or without arrow) | 18" cap. |
| or | |
| Cardinal direction | 12" cap. |
| Route numeral | 12"num. |
| Destination name (with or without arrow) | 12" l.c./16" u.c. |

[1] 8" cap. permissible at "Minor" Interchanges.

[2] Sign may be ground-mounted in gore of second exit.

TABLE 2.

SPACING FOR HIGHWAY DELINEATORS
ON HORIZONTAL CURVES

| Degree of Curve | Radius in Feet | Spacing on Curve | Spacing in Advance and Beyond Curve 1st Space | 2nd Space | 3rd Space |
|---|---|---|---|---|---|
| | 10,000 | 200 | 200 | 200 | 200 |
| 1 | | 152 | 200 | 200 | 200 |
| | 5,000 | 141 | 200 | 200 | 200 |
| | 3,000 | 109 | 196 | 200 | 200 |
| 2 | | 106 | 191 | 200 | 200 |
| | 2,500 | 99 | 178 | 200 | 200 |
| | 2,000 | 88 | 158 | 200 | 200 |
| 3 | | 86 | 155 | 200 | 200 |
| | 1,800 | 84 | 151 | 200 | 200 |
| | 1,600 | 78 | 140 | 200 | 200 |
| 4 | | 74 | 133 | 200 | 200 |
| | 1,400 | 74 | 133 | 200 | 200 |
| | 1,200 | 68 | 122 | 200 | 200 |
| 5 | | 66 | 119 | 198 | 200 |
| | 1,000 | 62 | 112 | 186 | 200 |
| | 900 | 58 | 104 | 174 | 200 |
| 7 | | 55 | 99 | 165 | 200 |
| | 800 | 55 | 99 | 165 | 200 |
| | 700 | 51 | 92 | 153 | 200 |
| 9 | | 48 | 86 | 144 | 200 |
| | 600 | 47 | 85 | 141 | 200 |
| | 500 | 42 | 76 | 126 | 200 |
| 12 | | 41 | 74 | 123 | 200 |
| | 400 | 37 | 67 | 111 | 200 |
| 15 | | 36 | 65 | 108 | 200 |
| | 350 | 35 | 63 | 105 | 200 |
| 18 | | 33 | 59 | 99 | 198 |
| | 300 | 32 | 58 | 96 | 192 |
| 21 | | 30 | 54 | 90 | 180 |
| | 250 | 28 | 50 | 84 | 168 |
| 25 | | 28 | 50 | 84 | 168 |
| | 200 | 24 | 43 | 72 | 144 |
| 30 | | 24 | 43 | 72 | 144 |
| | 150 | 20 | 36 | 60 | 120 |
| 40 | | 19 | 34 | 57 | 114 |
| | 100 | 14 | 25 | 42 | 84 |

The spacing S on the curve is found from the Formula $S = 2\sqrt{R - 50}$, where R is the radius of the curve in feet. The spacing to the first delineator in advance of and beyond the curve is 1.8 S, to the next delineator 3S, and to the next 6S, but not to exceed 200 feet.

Minimum Spacing = 10 feet.

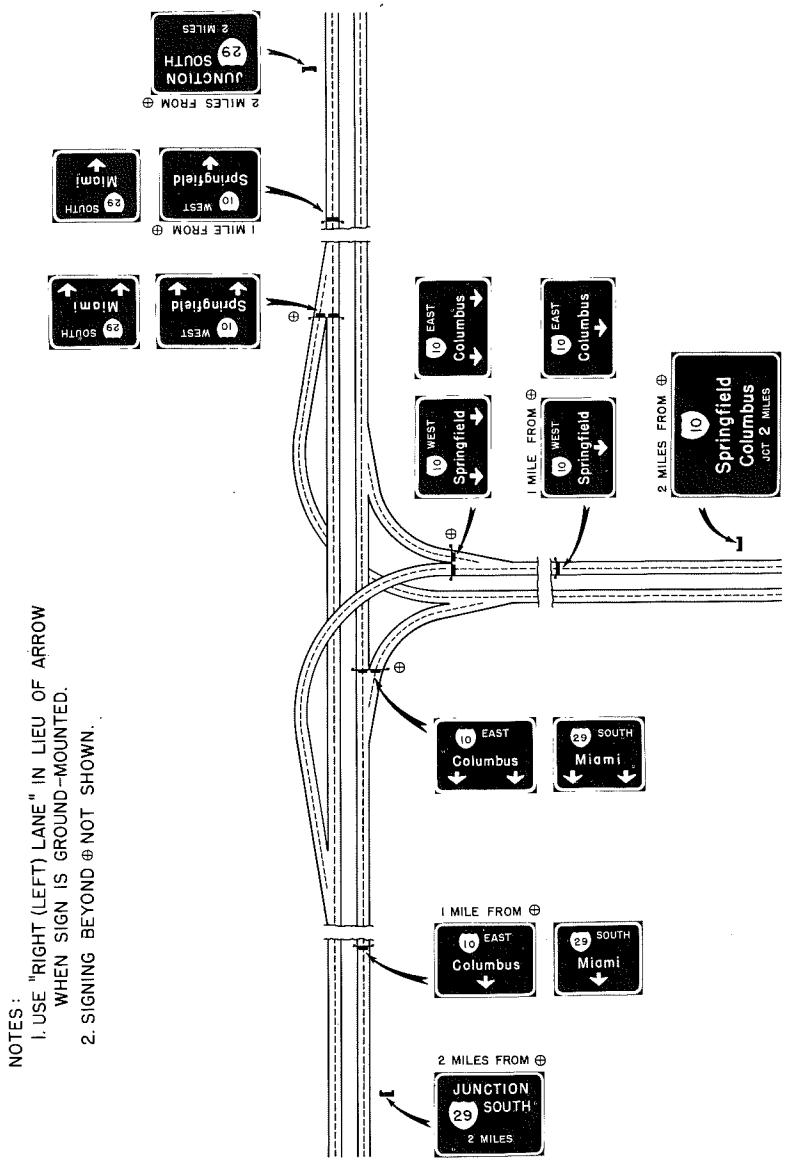



Figure 1. Interchange of two Interstate routes

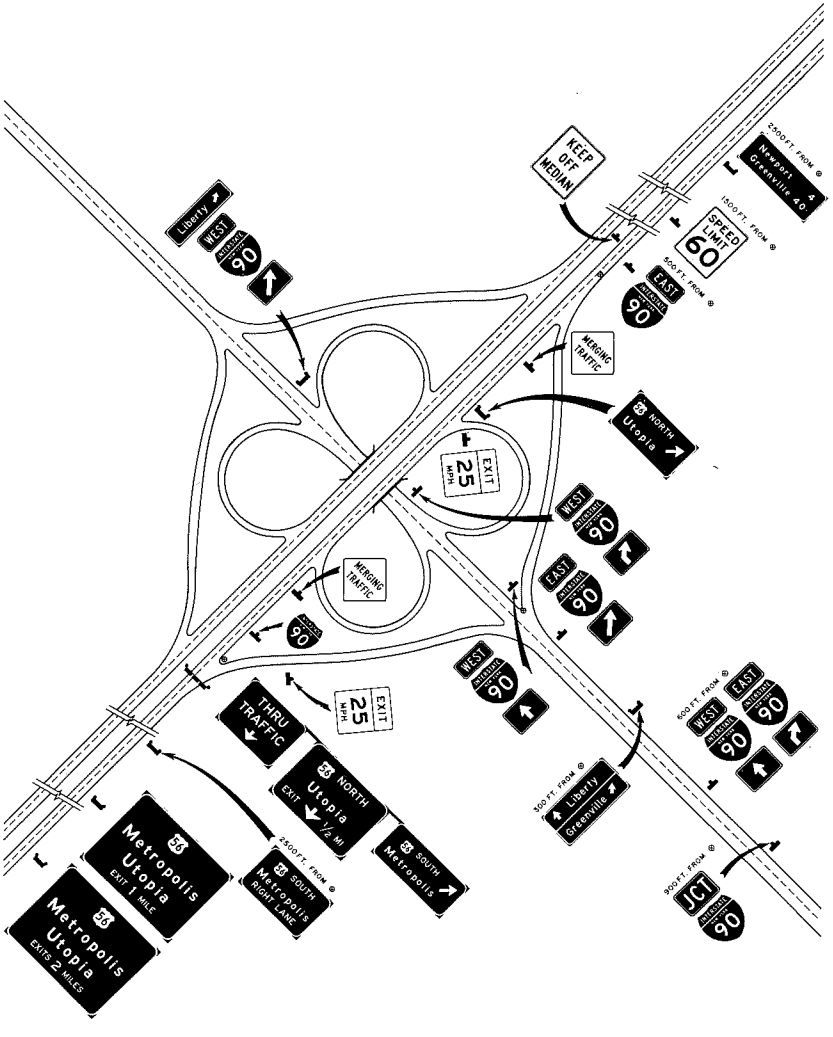



Figure 2. Typical cloverleaf interchange

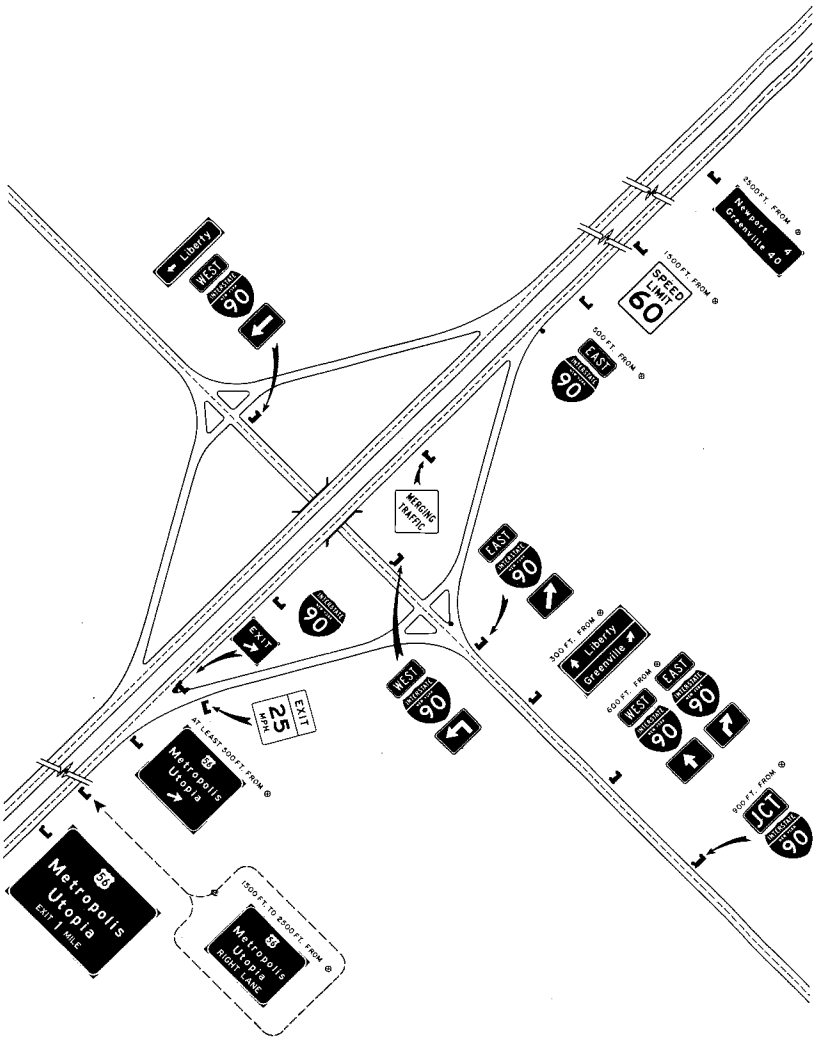



Figure 3. Diamond interchange—rural

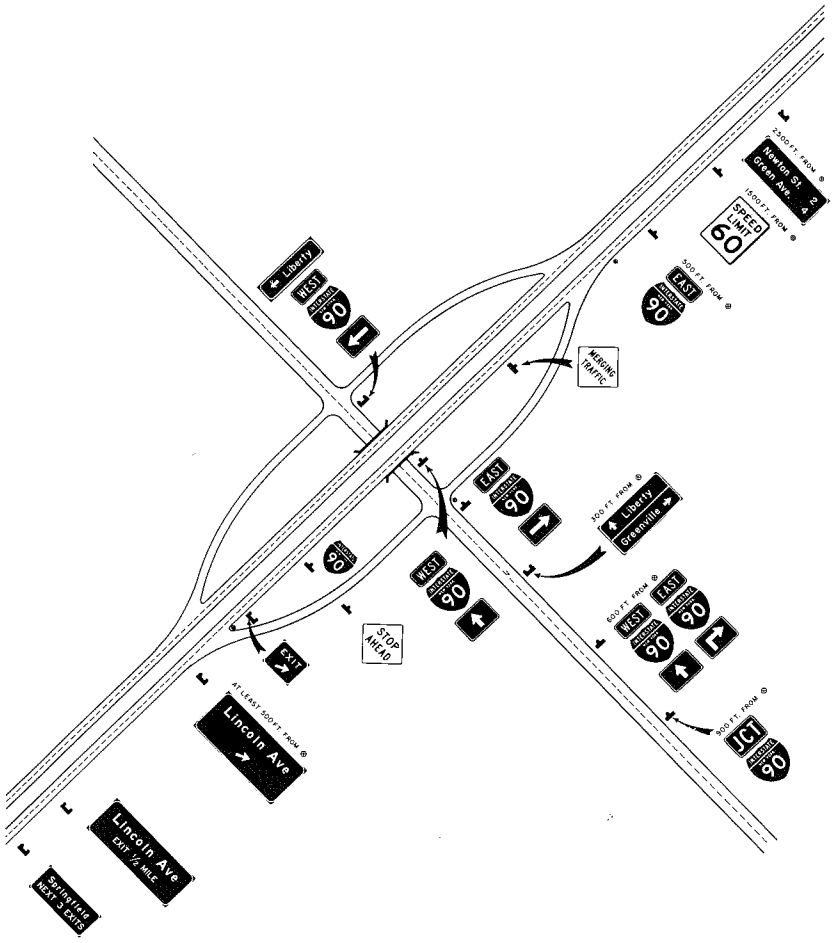



Figure 4. Diamond interchange—urban

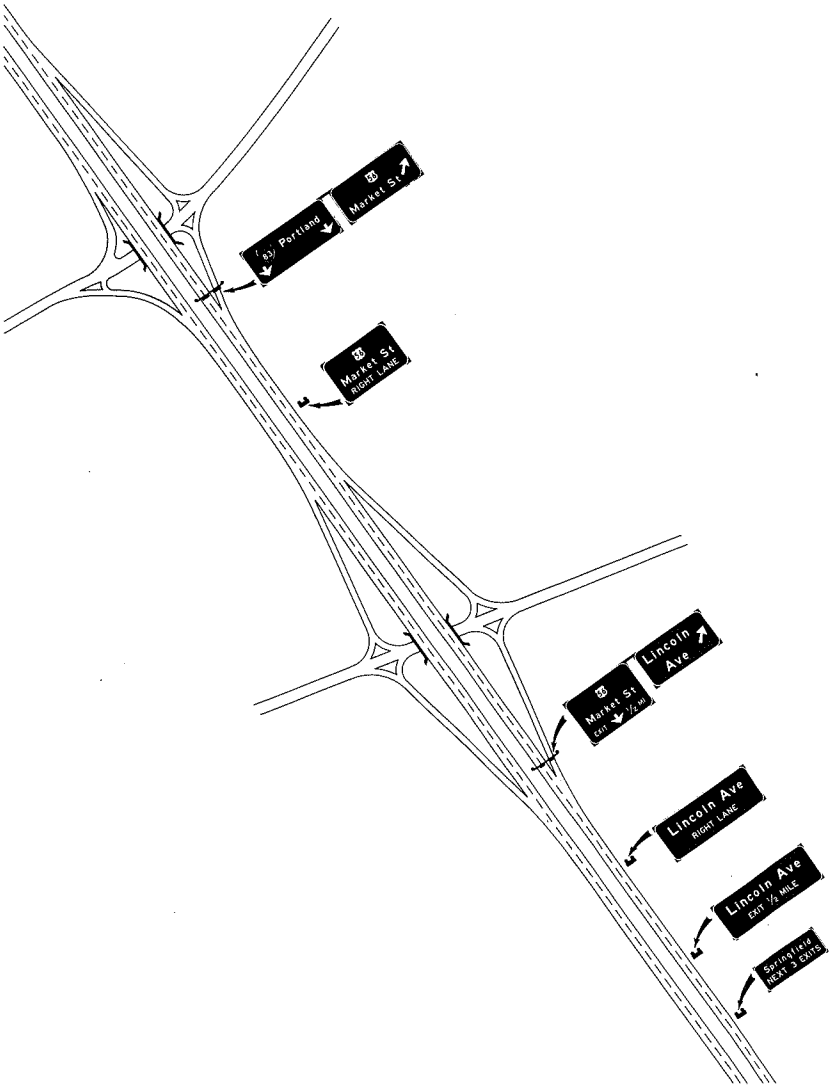



Figure 5. Two closely spaced interchanges showing sequence signs

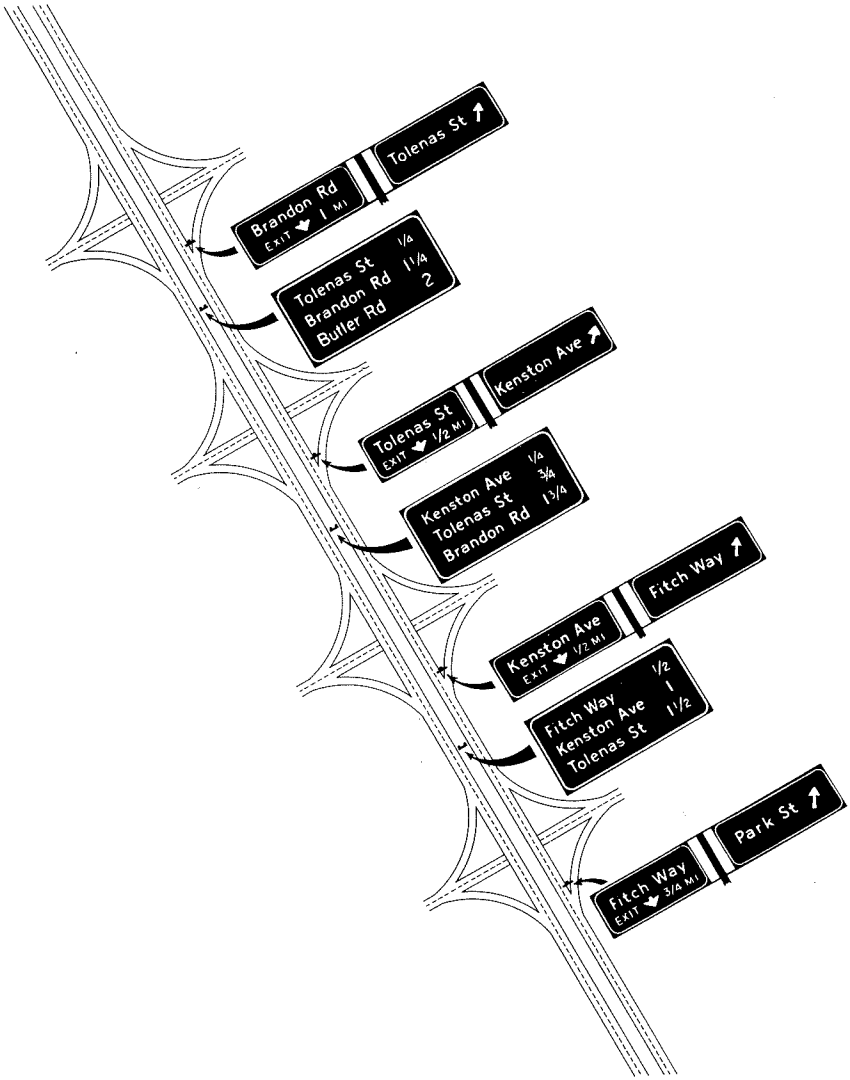



Figure 6. Series of closely spaced interchanges showing sequence signs

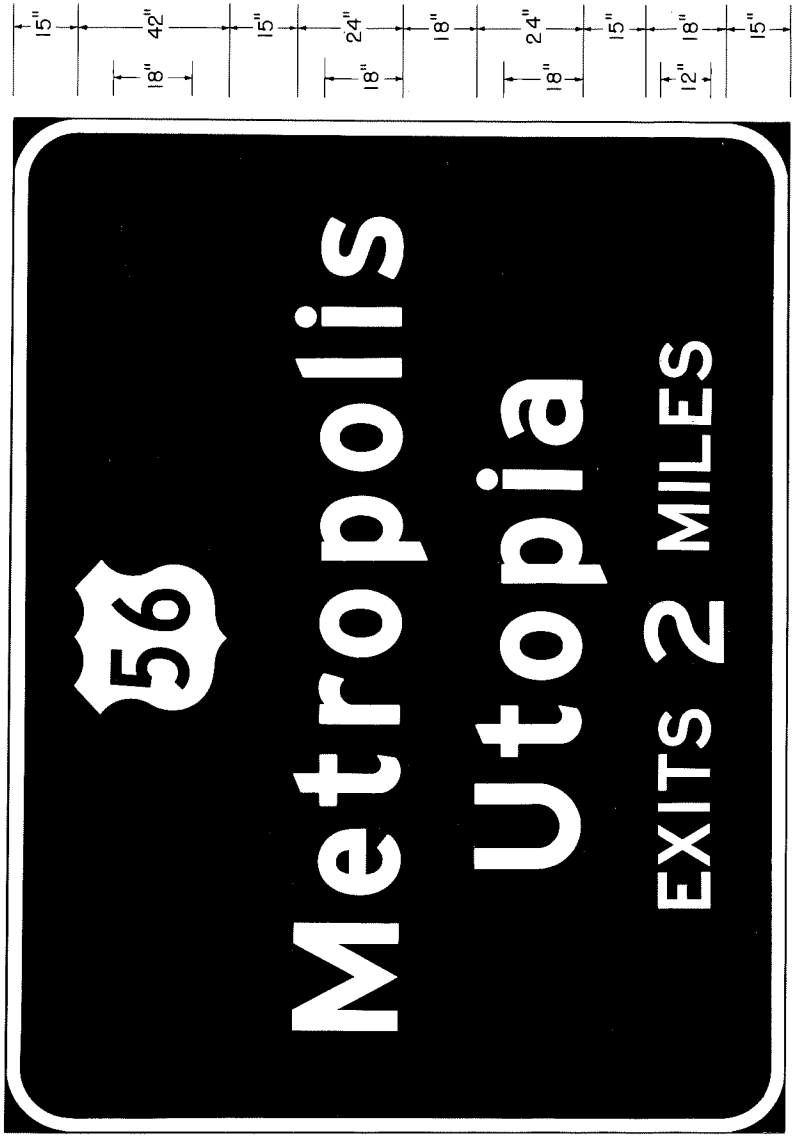



Figure 7. Advance guide sign—major interchange

Figure 8. Advance guide sign—major interchange—urban


Figure 9. Advance guide sign—intermediate interchange

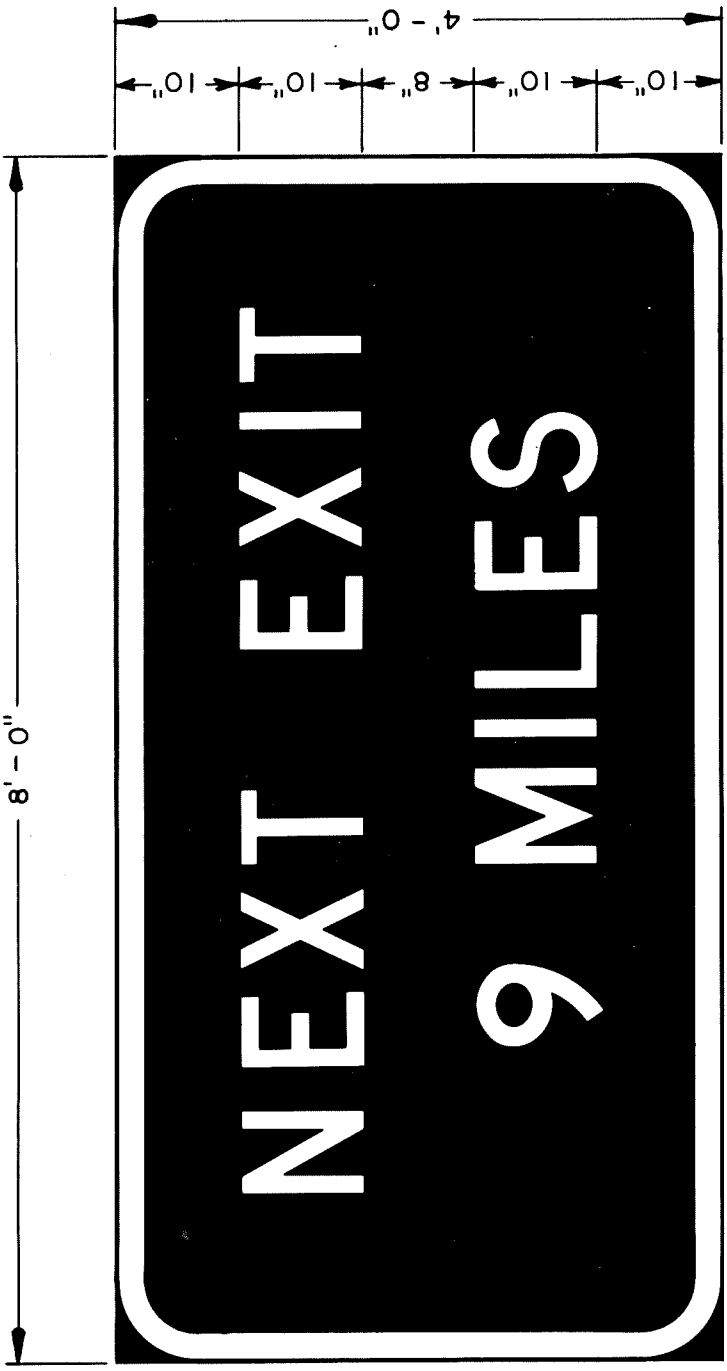



Figure 10. REST EXIT sign


Figure 11. Exit direction sign—single exit interchange

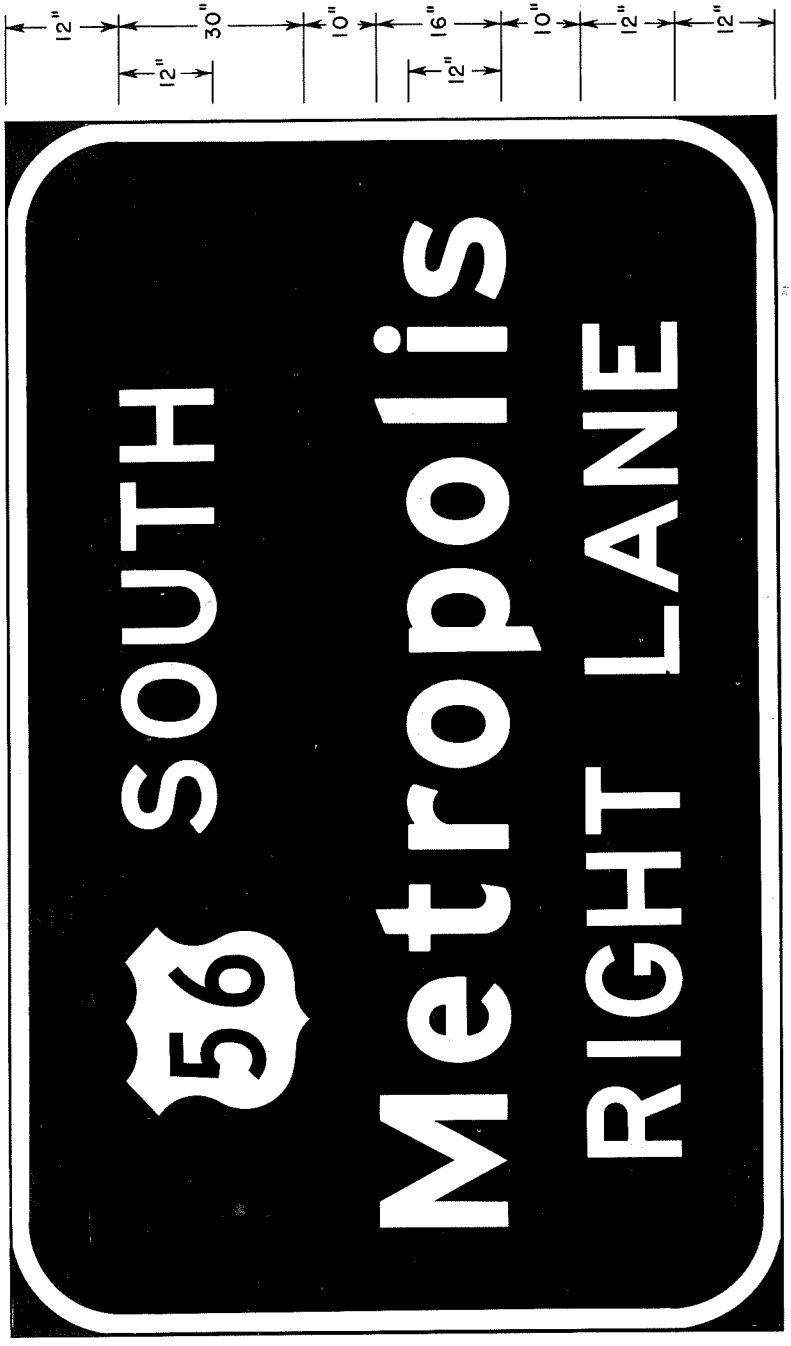



Figure 12. Exit direction sign—multiple exit interchange

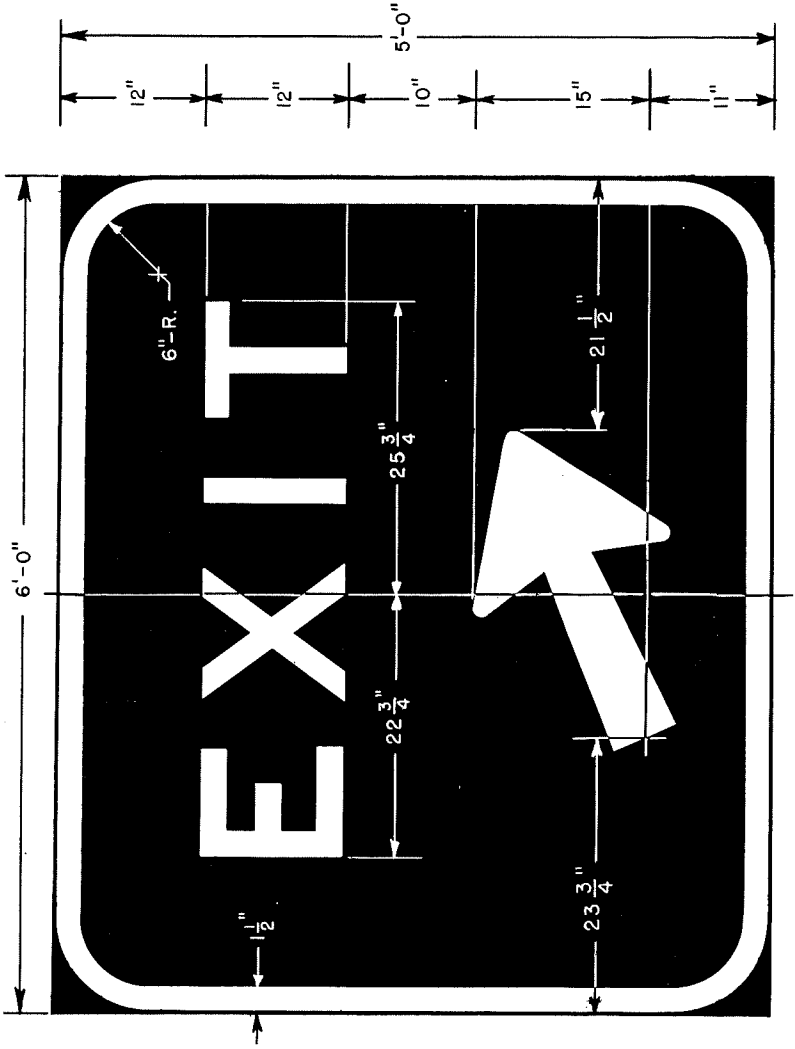



Figure 13. Gore EXIT sign

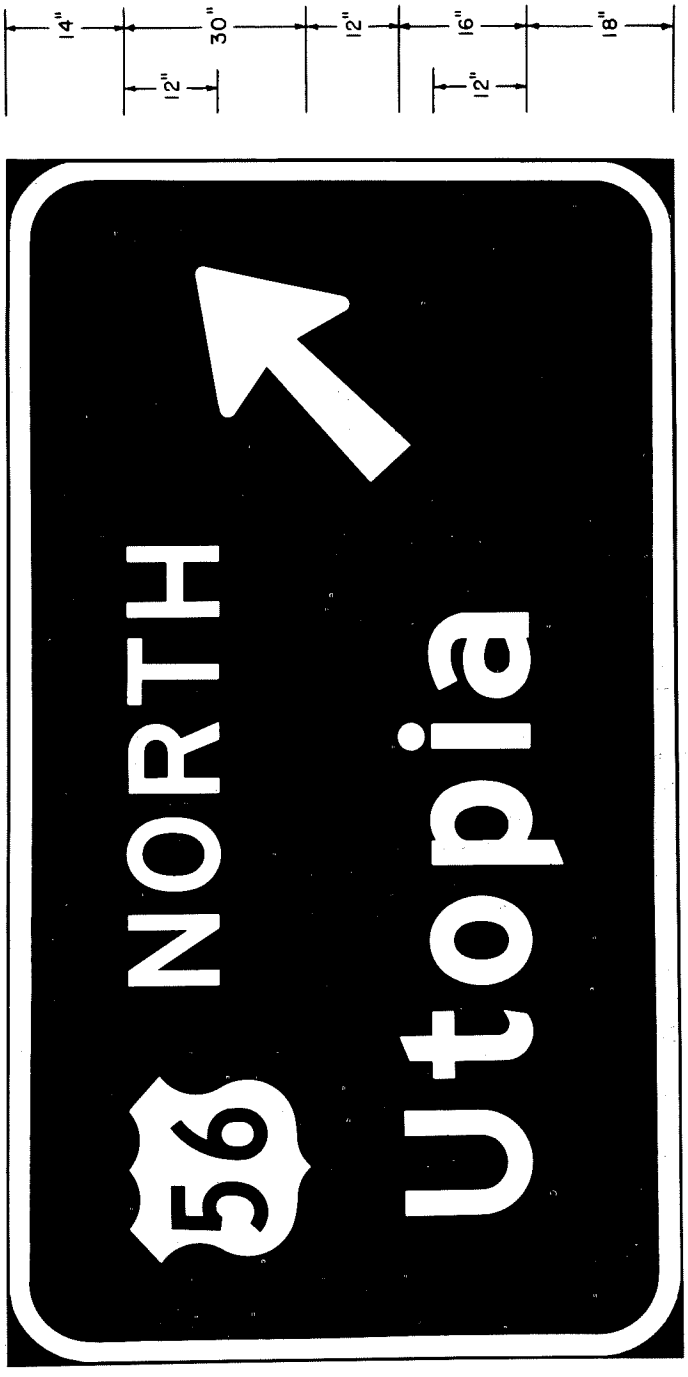



Figure 14. Gore sign—ramp lane


Figure 15. Overhead gore sign—right through lane


Figure 16. Overhead gore sign—left through lane

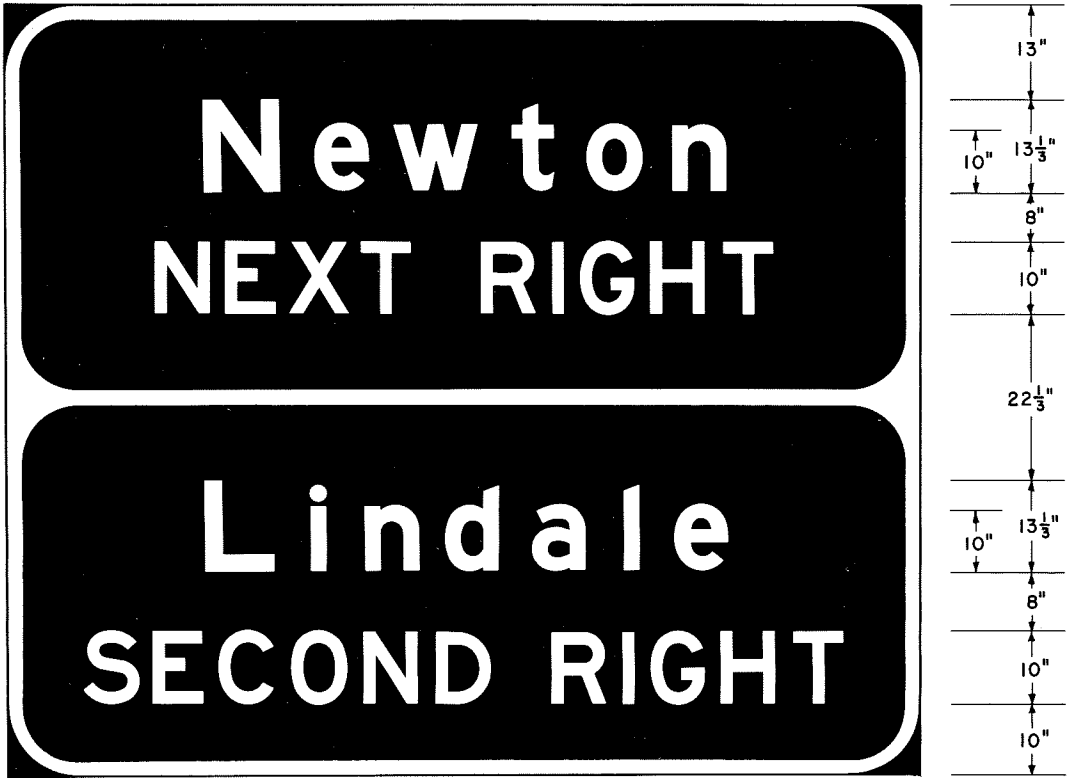



Figure 17. Supplemental advance guide sign—multiple exit interchange

Figure 18. Mileage sign

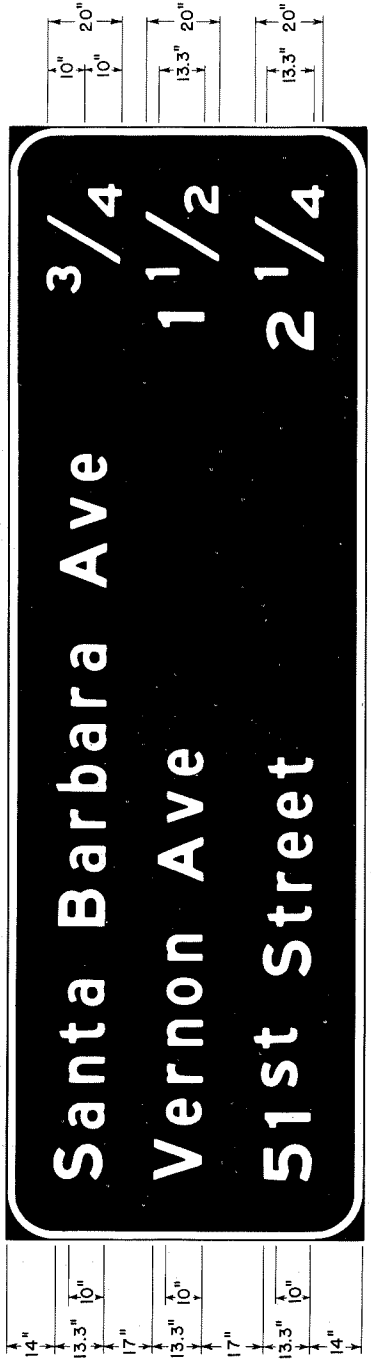
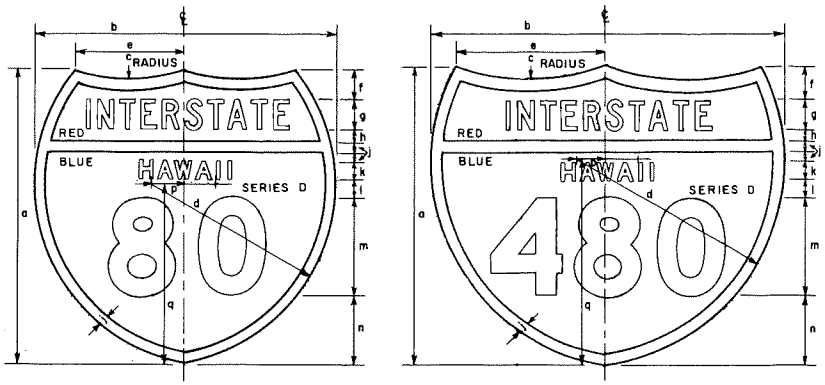



Figure 19. Interchange sequence sign

Figure 20. NEXT . . . EXITS sign

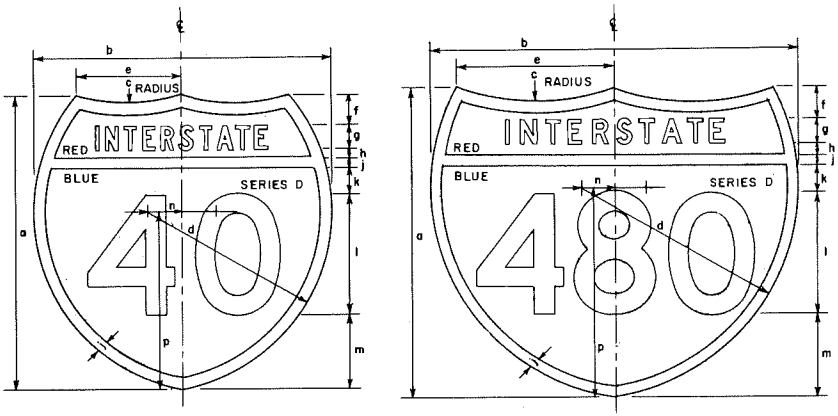
## INTERSTATE SHIELDS - INDEPENDENT USE




| | 6" NUMERALS | 8" NUMERALS | | 12" NUMERALS | |
|---|---|---|---|---|---|
| | 2 AND 3 DIGITS | 2 DIGITS | 3 DIGITS | 2 DIGITS | 3 DIGITS |
| a | 18 | 24 | 25 | 36 | 36 |
| b | 21 | 24 | 30 | 36 | 42 |
| c | 13-1/8 | 15 | 17-1/2 | 22-1/2 | 26-1/4 |
| d | 12-5/8 | 15 | 16-3/4 | 22-1/2 | 25-1/4 |
| e | 9-1/4 | 8-3/4 | 12-3/4 | 13-1/8 | 18-3/8 |
| f | 1-25/32 | 2-3/8 | 2-3/8 | 3-9/16 | 3-9/16 |
| g | 1-7/8 C | 2-1/2 C | 2-1/2 C | 3-3/4 C | 3-3/4 C |
| h | 3/4 | 1 | 1-1/8 | 1-1/2 | 1-1/2 |
| j | 9/16 | 3/4 | 3/4 | 1-1/8 | 1-1/8 |
| k | 1-1/8 D | 1-1/2 D | 1-1/2 D | 2-1/4 D | 2-1/4 D |
| l | 1-1/32 | 1-3/8 | 2-1/4 | 2-1/16 | 2-1/16 |
| m | 6 | 8 | 8 | 12 | 12 |
| n | 4-5/16 | 5-3/4 | 5-3/4 | 8-5/8 | 8-5/8 |
| p | 2-1/8 | 3 | 1-3/4 | 4-1/2 | 4-1/4 |
| q | 12-1/2 | 14-5/8 | 16-11/16 | 21-15/16 | 24-7/8 |

Figure 21. Interstate shields—independent use

## INTERSTATE SHIELDS ON GUIDE SIGNS




| | 10" NUMERALS | | 12" NUMERALS | 15" NUMERALS | | 18" NUMERALS | |
|---|---|---|---|---|---|---|---|
| | 2 DIGITS | 3 DIGITS | 3 DIGITS | 2 DIGITS | 3 DIGITS | 2 DIGITS | 3 DIGITS |
| a | 24 | 25 | 36 | 36 | 38 | 48 | 51 |
| b | 24 | 30 | 36 | 36 | 45 | 48 | 58 |
| c | 15 | 17-1/2 | 22-1/2 | 22-1/2 | 26-1/4 | 30 | 34 |
| d | 15 | 16-3/4 | 22-1/2 | 22-1/2 | 25-1/4 | 30 | 33 |
| e | 8-3/4 | 12-3/4 | 13-1/8 | 13-1/8 | 19 | 17-1/2 | 23-3/8 |
| f | 2 | 2-1/4 | 3-7/16 | 3-7/16 | 3-13/16 | 4-3/4 | 5-1/4 |
| g | 2 | 2 D | 3 C | 3 C | 3 D | 5 C | 5 D |
| h | 1-3/16 | 1-3/16 | 1-5/16 | 1-5/16 | 1-5/16 | 2 | 1-3/4 |
| j | 3/4 | 3/4 | 1-1/8 | 1-1/8 | 1-1/8 | 1-1/2 | 1-1/2 |
| k | 2-9/16 | 2-9/16 | 3-1/8 | 3-1/8 | 3-1/8 | 4 | 4 |
| l | 10 | 10 | 12 | 15 | 15 | 18 | 18 |
| m | 5-1/2 | 6-1/4 | 12 | 9 | 10-5/8 | 12-3/4 | 15-1/2 |
| n | 3 | 1-3/4 | 4-1/2 | 4-1/2 | 2-3/4 | 6 | 4 |
| p | 14-5/8 | 16-11/16 | 21-15/16 | 21-15/16 | 25-1/8 | 29-1/4 | 32-3/4 |

Figure 22. Interstate shields on guide signs

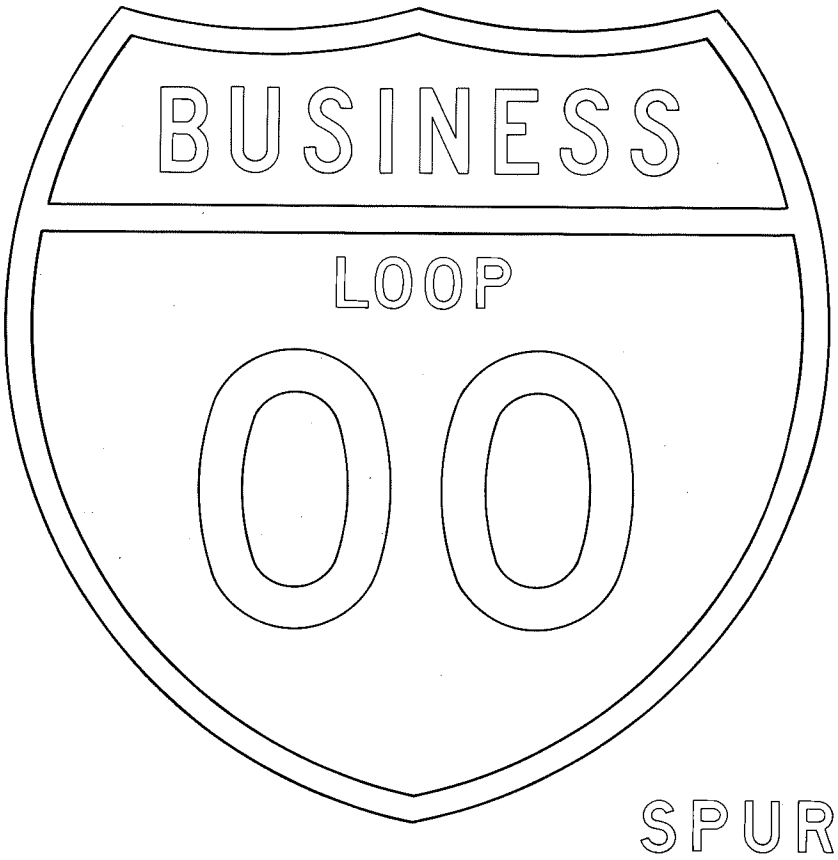
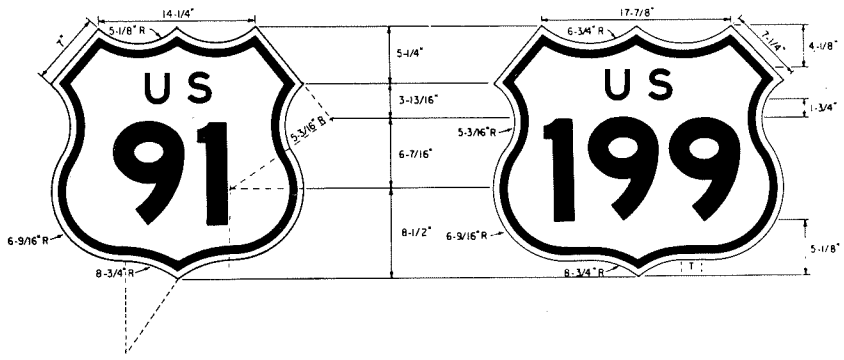



Figure 23. Off-Interstate business route marker

## U. S. SHIELDS - INDEPENDENT USE
### FOR JOINT MOUNTING WITH INTERSTATE SHIELDS

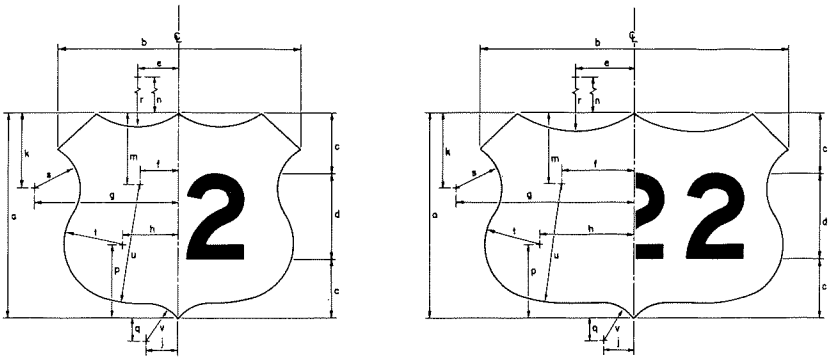



| | SHIELD SIZE | LETTER SIZE & SERIES | | BORDER | MARGIN |
|---|---|---|---|---|---|
| | | LINE 1 | LINE 2 | | |
| 1 & 2 DIGITS | 24"X24" | 3"E | 10"D* | 3/4" | 9/16" |
| 3 DIGITS | 28"X24" | " | " | " | " |

*STROKE WIDTH .018" PER INCH OF LETTER HEIGHT

Figure 24. U. S. shields for joint mounting with Interstate shields

## U. S. SHIELDS FOR USE ON GUIDE SIGNS




| | 10" NUMERALS | | 12" NUMERALS | | 15" NUMERALS | | 18" NUMERALS | |
|---|---|---|---|---|---|---|---|---|
| | 2 DIGITS | 3 DIGITS | 2 DIGITS | 3 DIGITS | 2 DIGITS | 3 DIGITS | 2 DIGITS | 3 DIGITS |
| a | 24 | 24 | 30 | 30 | 36 | 36 | 42 | 42 |
| b | 28 | 36 | 35 | 45 | 42 | 54 | 49 | 63 |
| c | 7 | 7 | 9 | 9 | 10-1/2 | 10-1/2 | 12 | 12 |
| d | 10 | 10 | 12 | 12 | 15 | 15 | 18 | 18 |
| e | 4-3/4 | 6-13/16 | 5-15/16 | 8-9/16 | 7-1/8 | 10-1/4 | 8-5/16 | 11-15/16 |
| f | 4-3/8 | 8-3/8 | 5-1/2 | 10-1/2 | 6-9/16 | 12-9/16 | 7-5/8 | 14-5/8 |
| g | 16-5/8 | 20-5/8 | 20-13/16 | 25-13/16 | 24-15/16 | 30-15/16 | 29-1/8 | 36-1/8 |
| h | 7 | 11 | 8-3/4 | 13-3/4 | 10-1/2 | 16-1/2 | 12-1/4 | 19-1/4 |
| j | 3-5/8 | 3-5/8 | 4-9/16 | 4-9/16 | 5-1/2 | 5-1/2 | 6-3/8 | 6-3/8 |
| k | 8-13/16 | 8-13/16 | 11 | 11 | 13-3/16 | 13-3/16 | 15-3/8 | 15-3/8 |
| m | 8-1/4 | 8-1/4 | 10-5/16 | 10-5/16 | 12-3/8 | 12-3/8 | 14-1/2 | 14-1/2 |
| n | 6-1/2 | 9-7/8 | 8-3/16 | 12-5/16 | 9-13/16 | 14-13/16 | 11-7/16 | 17-1/4 |
| p | 8-11/16 | 8-11/16 | 10-13/16 | 10-13/16 | 13 | 13 | 15-3/16 | 15-3/16 |
| q | 2-11/16 | 2-11/16 | 3-5/16 | 3-5/16 | 4 | 4 | 4-11/16 | 4-11/16 |
| r | 8-1/8 | 12 | 10-3/16 | 15 | 12-3/16 | 18 | 14-1/4 | 21 |
| s | 5-5/16 | 5-5/16 | 6-5/8 | 6-5/8 | 7-15/16 | 7-15/16 | 9-5/16 | 9-5/16 |
| t | 6-3/8 | 6-3/8 | 7-15/16 | 7-15/16 | 9-9/16 | 9-9/16 | 11-1/8 | 11-1/8 |
| u | 13-15/16 | 13-15/16 | 17-3/8 | 17-3/8 | 20-7/8 | 20-7/8 | 24-3/8 | 24-3/8 |
| v | 4-1/2 | 4-1/2 | 5-5/8 | 5-5/8 | 6-3/4 | 6-3/4 | 7-7/8 | 7-7/8 |

Where reflectorized borders are used, the outer perimeter of the border shall match the outer perimeter of the above shields.

Figure 25. U. S. shields on guide signs

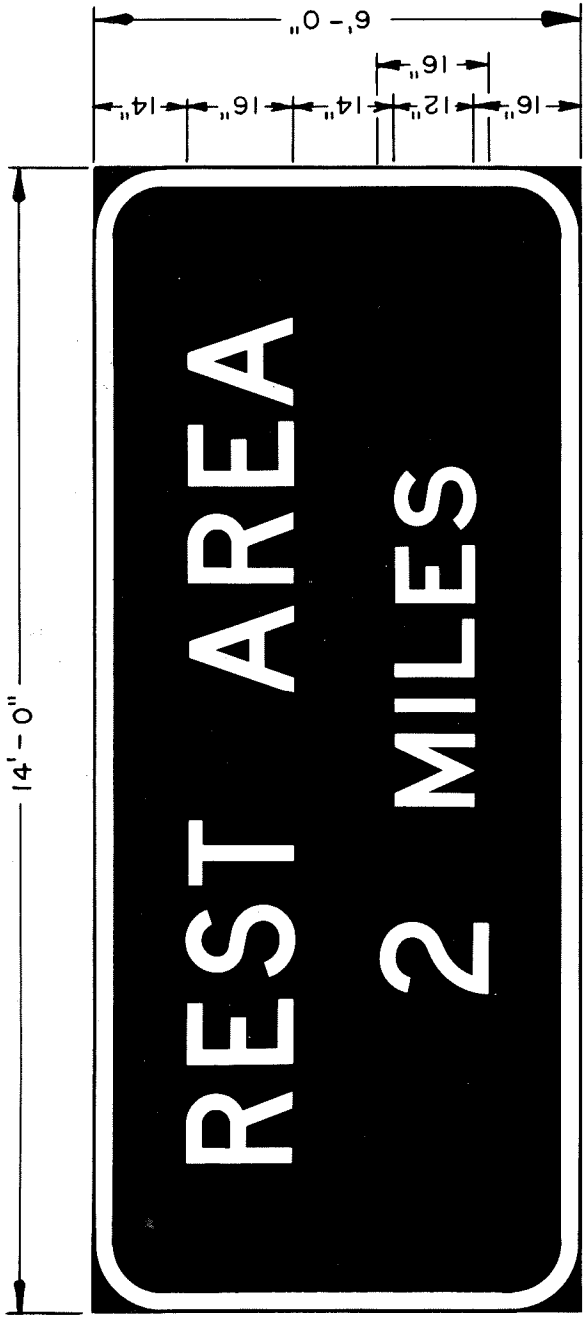



Figure 26. Rest area advance guide sign

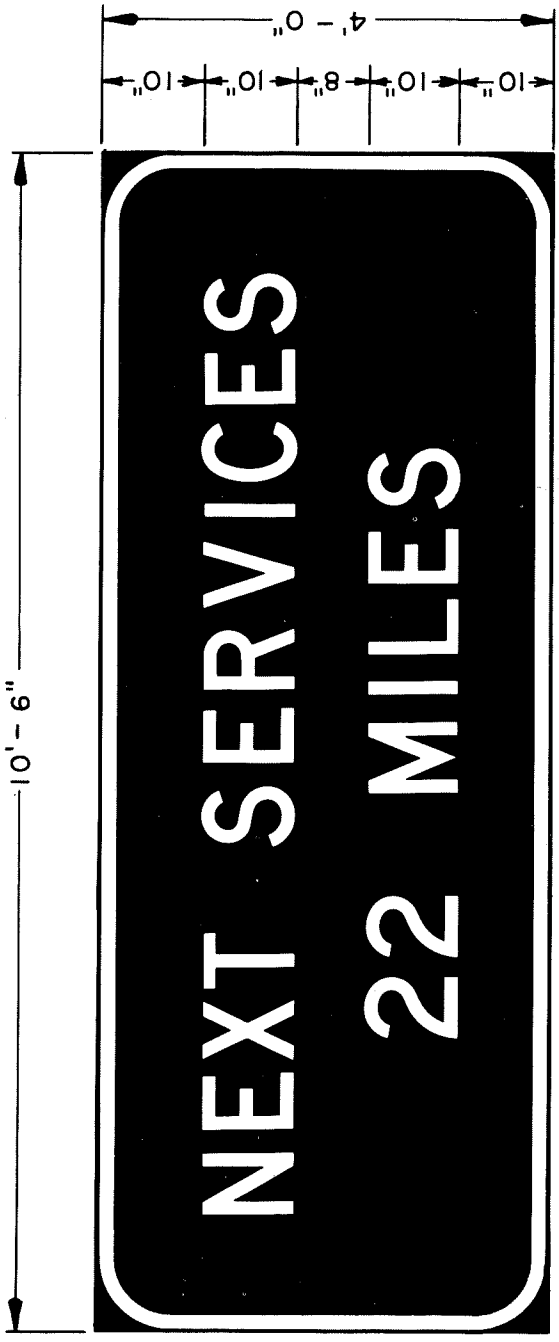



Figure 27. NEXT SERVICES sign

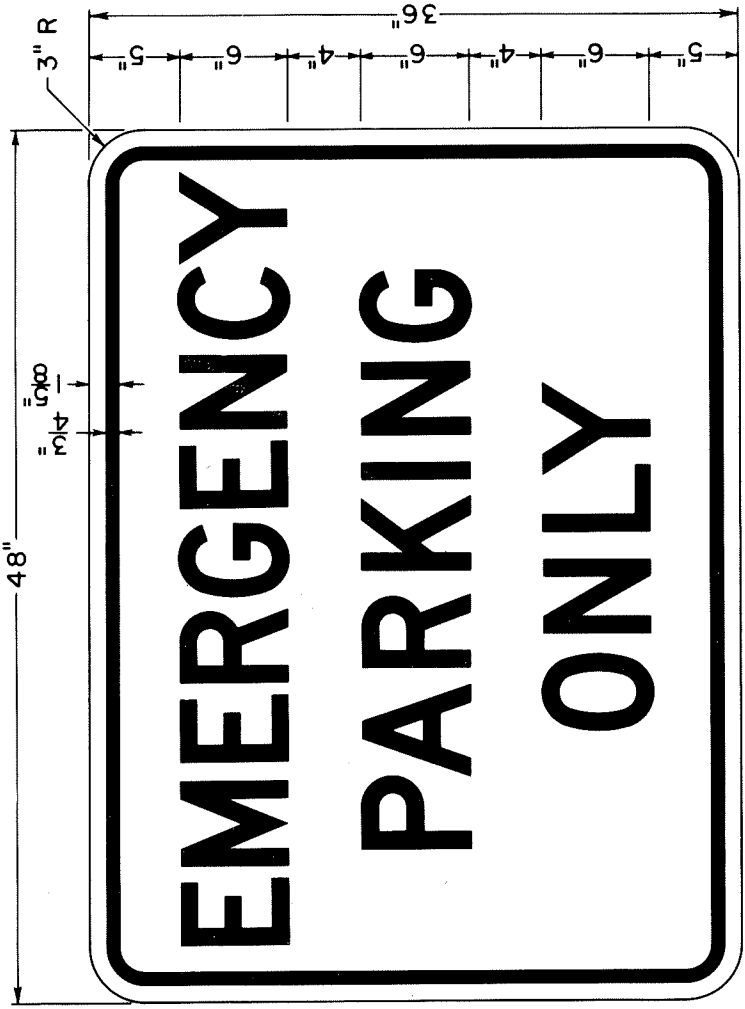
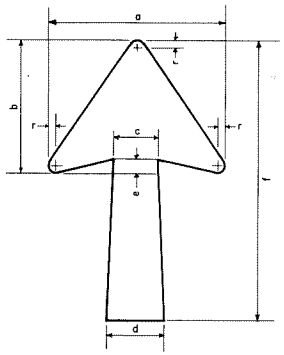



Figure 28. EMERGENCY PARKING (STOPPING) ONLY sign
(LETTERS—SERIES D)
Stroke width: 0.18″ per inch of letter height


(LETTERS & NUMERALS – SERIES E)
STROKE WIDTH: 0.2" PER INCH OF LETTER HEIGHT

Figure 29. Advisory EXIT speed sign
(LETTERS & NUMERALS—SERIES E)
Stroke width: 0.2″ per inch of letter height

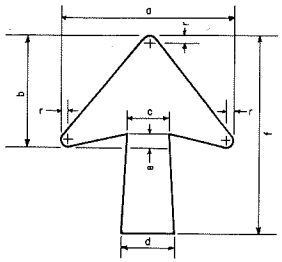



DIMENSIONS OF ARROW WHEN USED WITH VARIOUS LETTER SIZES

"A" Vertical or Diagonal Arrow

| LETTER SIZE | ARROW DIMENSIONS IN INCHES | | | | | | |
|---|---|---|---|---|---|---|---|
| | a | b | c | d * | e | f * | r |
| 8" Cap. | 15-1/8 | 11-9/16 | 3-3/4 | 5 | 1-5/16 | 24-1/4 | 13/16 |
| 13⅓" U.C., 10-12" Cap. | 18-1/4 | 14 | 4-1/2 | 6 | 1-1/2 | 29-1/4 | 3/4 |
| 16" U.C. | 22-1/4 | 17 | 5-3/8 | 7-1/8 | 1-3/4 | 35-5/8 | 1 |

* Recommended dimensions. Taper should be held constant for longer or shorter shaft lengths.




"B" Vertical or Diagonal Arrow

| LETTER SIZE | ARROW DIMENSIONS IN INCHES | | | | | | |
|---|---|---|---|---|---|---|---|
| | a | b | c | d * | e | f * | r |
| 8"-10" Cap. | 14-1/4 | 9-13/16 | 3-3/8 | 4-1/2 | 1-5/16 | 17-1/4 | 3/4 |
| 13⅓" U.C., 12" Cap. | 17-1/2 | 11-3/4 | 4-3/8 | 5-5/8 | 1-1/2 | 20-1/4 | 7/8 |
| 16" U.C. | 21-7/8 | 14-1/4 | 5 | 6-3/4 | 1-3/4 | 25 | 1 |

"C" Vertical Down Arrow

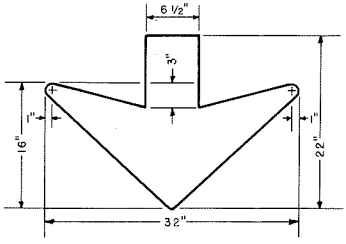



Figure 30. Design detail of standard arrows

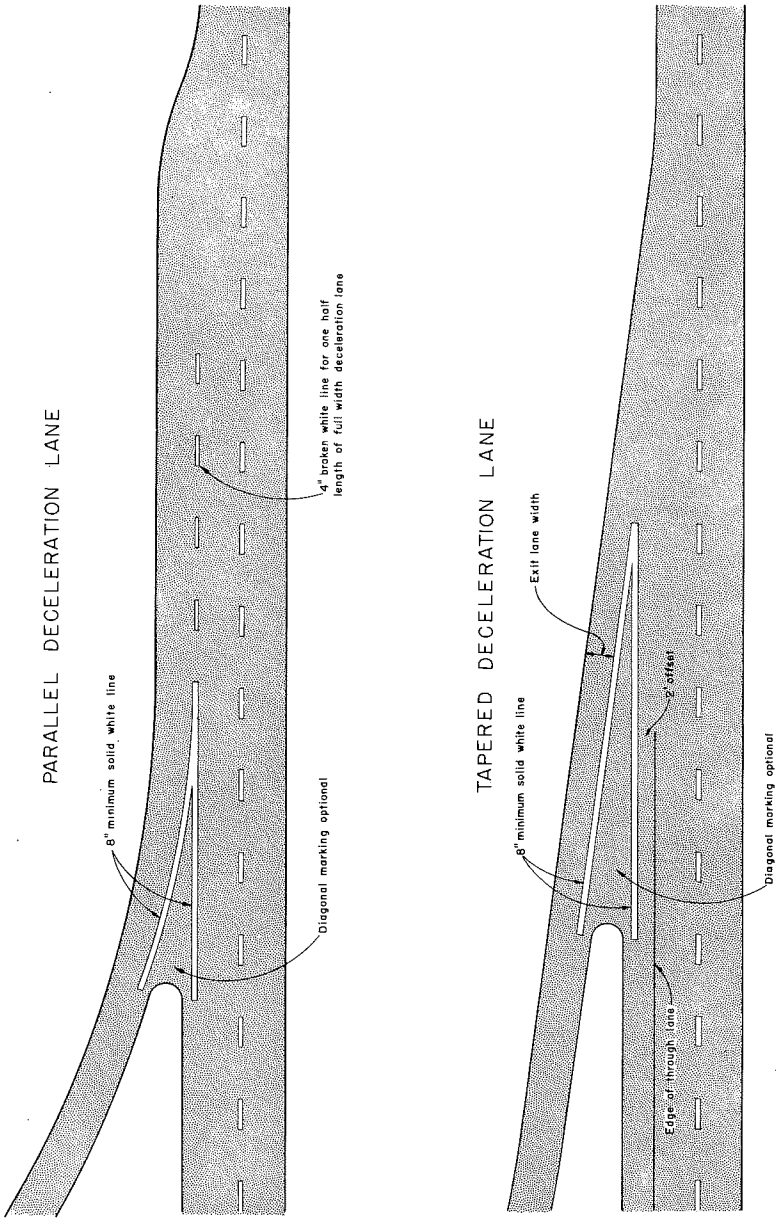



Figure 31. Exit ramp marking

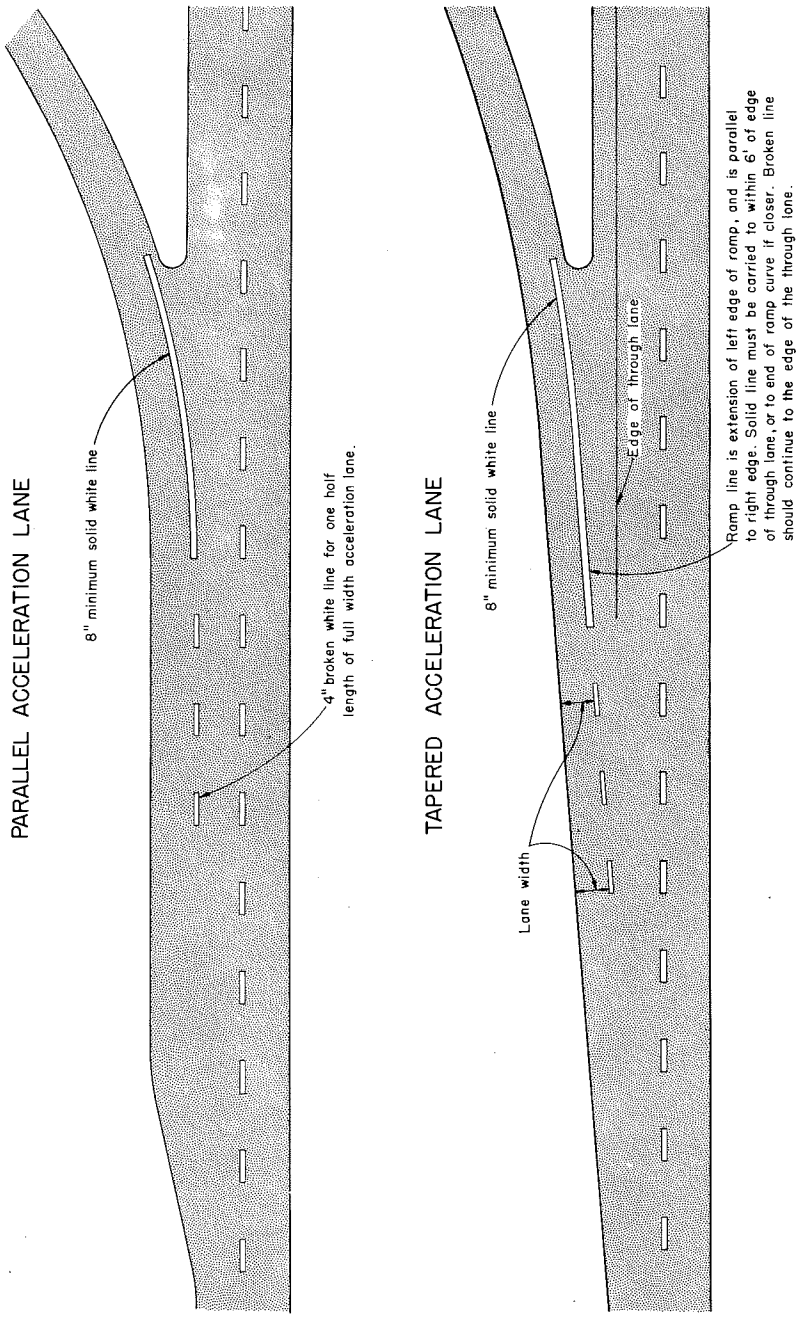



Figure 32. Entrance ramp marking

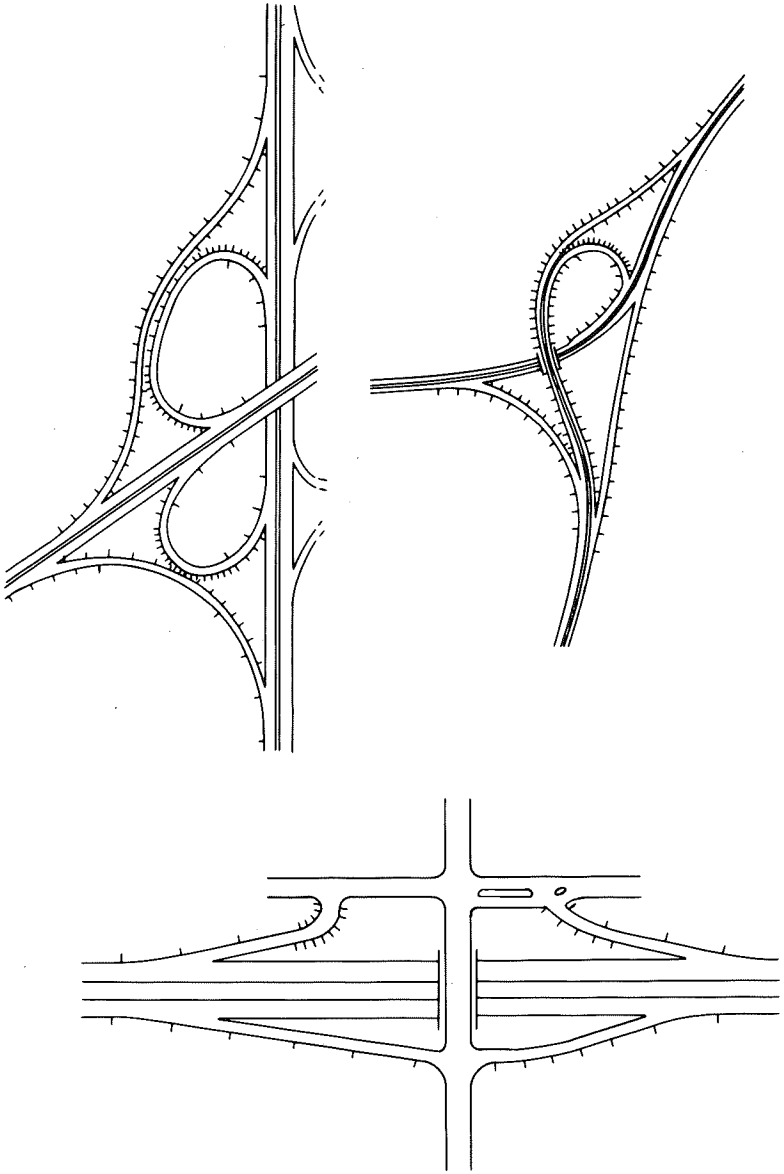


Figure 33. Typical interchange ramp delineation