



COMMON SIGNING ISSUES



In This Issue...

Overview	1
Non-Compliant Signs.....	2
Mounting Height and Location....	2
Location and Spacing	6
Sign Size.....	9
Sign Colors	10
Obsolete Signs	10
Faded and Non-Retroreflective Signing.....	11
Blanket Speed Postings	12
Excessive and Irrelevant Signs at ECFs.....	12
Develop a Sign Management System (SMS).....	13

TRANSPORTATION ENGINEERING AGENCY (TEA)

1 Soldier Way
Scott Air Force Base, Illinois
62225-5006
<http://www.sddc.army.mil/sites/TEA>



Scan Here to Quickly Visit Us Online!

Overview

A common problem on military installations is too many regulatory and warning signs. There is a misconception that extra signs “can’t do any harm.” In reality, extra signs create unnecessary clutter and detract from necessary traffic signs. Other common problems include:

- ✓ Using non-standard, altered, homemade-type signs, frequently with substandard size legends and without retroreflective sheeting material
- ✓ Installing signs at a substandard height
- ✓ Installing signs too close to other signs, or too close to a curve, turn, or intersection
- ✓ Incorrectly sized signs
- ✓ Using improper colors (e.g., brown and white for regulatory and warning signs)
- ✓ Allowing obsolete signs to remain in place
- ✓ Not replacing non-retroreflective or faded signs
- ✓ Incorrect use of blanket speed limit postings
- ✓ Excessive and irrelevant signs at entry control facilities (ECFs)
- ✓ Lack of a sign management system

The “how-to” book for traffic signs is Part 2 of the Federal Highway Administration (FHWA)'s Manual on Uniform Traffic Control Devices (MUTCD). The primary purpose of the MUTCD is to improve safety and reduce driver frustration by promoting uniformity in the design and application of traffic control devices.

FHWA also sponsors research to improve the quality and recognition of signs and works internationally to share ideas with other countries to promote uniformity on a global basis. This sharing of research on sign shapes, colors, symbols, and design details is very important when considering the number of international visitors.

Traffic signs are the most common and recognizable type of traffic control device. In fact, more than half of the MUTCD is devoted to the discussion and application of signs.

Non-Compliant Signs

One of the five requirements of traffic control devices, which includes signs, is to command respect. Signs made in in-house shops are acceptable if fabricated correctly, but there can be the risk of a sign not exactly matching the required fabrication. If a sign is intended to be standard but is not fabricated to the exact design, or if a sign has an altered message, it does not command this respect. Even if the intended message is valid, motorists will not respect the sign if it appears to not be legitimate.

A sign made incorrectly can take two forms: a sign intended to match a standard sign, or a homemade sign with a nonstandard intended message. Both of these categories are not allowed. The former may simply have a nonstandard font with other attributes otherwise correct. In all cases, standard signs must be used if available.

Temporary or emergency needs are often one reason that nonstandard signs might be used. Cardboard signs or signs printed on paper have been observed for this type of use. Instead of a homemade sign, a trailer-mounted, portable variable message sign is preferable for temporary or emergency needs. This provides a professional appearance and is consistent with similar uses by State Departments of Transportation. Installations are encouraged to have at least one portable variable message sign available.



Font is an important factor in establishing a compliant sign. As a general rule, one inch of letter height on a sign is visible for about 30 feet in advance of the sign. Also, different fonts have different widths and thicknesses which must be considered as a sign is fabricated.

The sign below is a non-compliant fabrication of a standard STOP sign. The font and dimensions of the legend used are incorrect. Compliant font and font sizes can be found in Section 2A.13 of the MUTCD and the Standard Highway Signs and Markings book.

STOP sign with Non-compliant Font



Mounting Height and Location

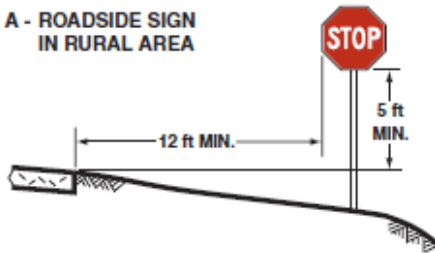
Improper mounting height and location is a common deficiency at military installations. Another deficiency associated with improperly placed signs is whether they are mounted on breakaway signposts, if required.

The MUTCD directs specific mounting heights and lateral offset locations for signs as illustrated in the images on the following pages. For pedestrian areas, the minimum mounting height is 7 feet to the bottom of the primary sign. This height allows pedestrians to walk freely beneath the sign. In non-pedestrian areas, the required minimum mounting height is 5 feet above the road level. A notable exception is a pedestrian pushbutton sign at a signalized intersection, which is mounted just above the pushbutton, required at 42 inches above the walking level.

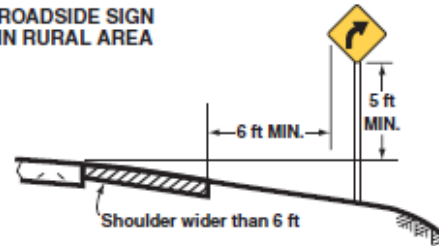
The lateral offset requirements for sign mounting require that signs be mounted outside the clear zone to the extent possible. In urban areas where curbing is present, installing signs outside the clear zone may not be possible or practical. In these urban areas, utilizing a breakaway sign support and utilizing the urban criteria of a minimum of 2 feet is acceptable. In rural areas the minimum is 12 feet. The goal is also to locate the sign out of the clear zone and provide sufficient visibility.

HEIGHTS AND LATERAL LOCATION OF SIGNS

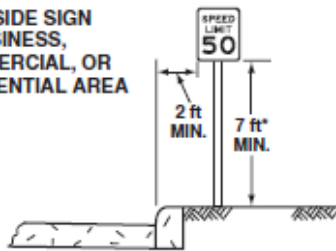
A - ROADSIDE SIGN
IN RURAL AREA



B - ROADSIDE SIGN
IN RURAL AREA

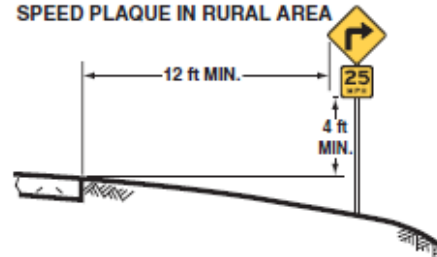


C - ROADSIDE SIGN
IN BUSINESS,
COMMERCIAL, OR
RESIDENTIAL AREA

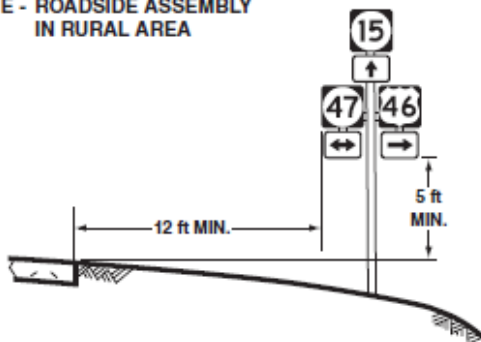


*Where parking or pedestrian movements are likely to occur

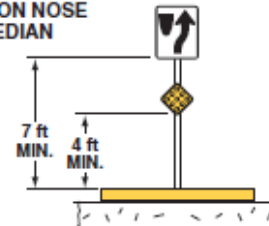
D - WARNING SIGN WITH ADVISORY
SPEED PLAQUE IN RURAL AREA



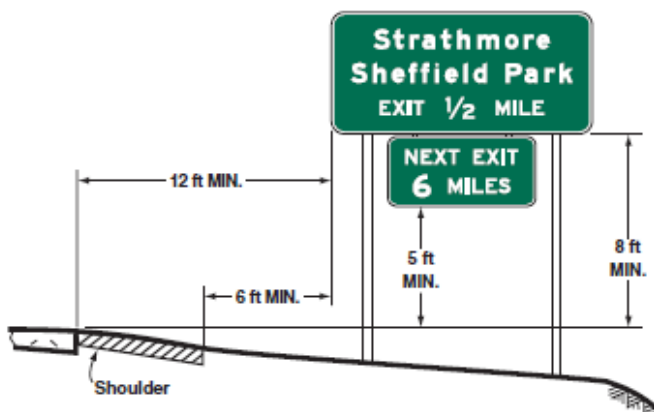
E - ROADSIDE ASSEMBLY
IN RURAL AREA



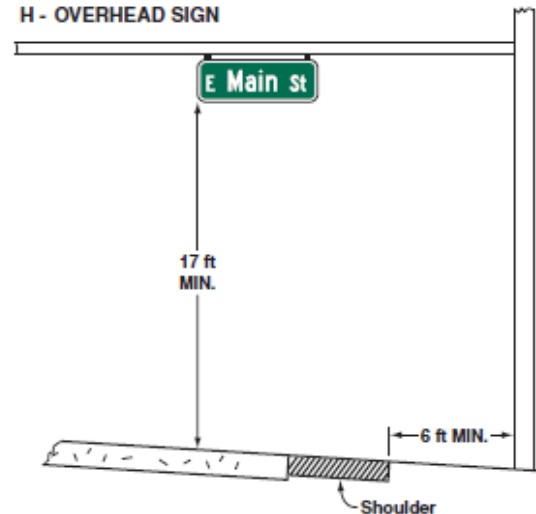
F - SIGN ON NOSE
OF MEDIAN



G - FREEWAY OR EXPRESSWAY SIGN WITH SECONDARY SIGN



H - OVERHEAD SIGN

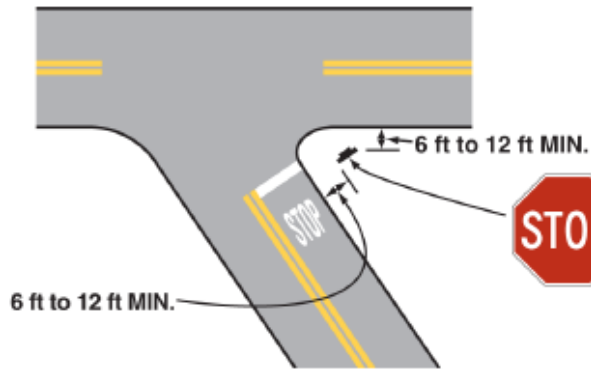


Note:

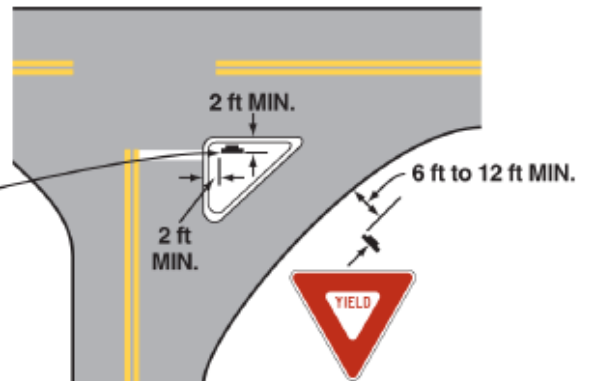
See *MUTCD* Section 2A.19 for reduced lateral offset distances that may be used in areas where lateral offsets are limited, and in business, commercial, or residential areas where sidewalk width is limited or where existing poles are close to the curb.

Image Source: MUTCD

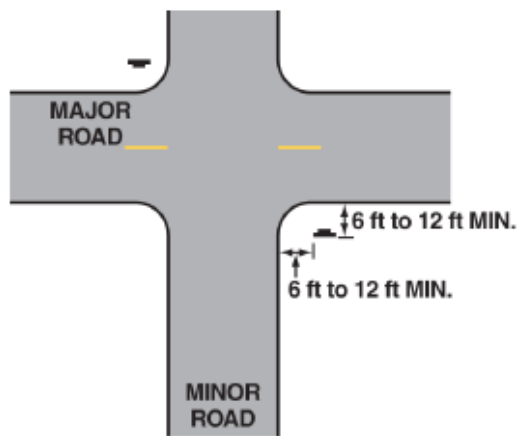
HEIGHTS AND LATERAL LOCATION OF SIGNS



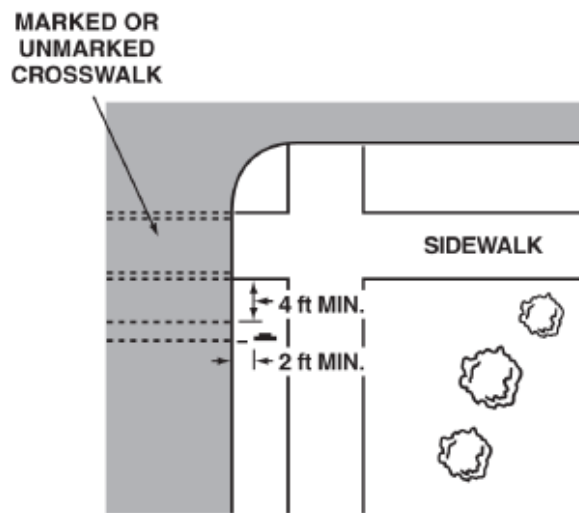
A - ACUTE ANGLE INTERSECTION



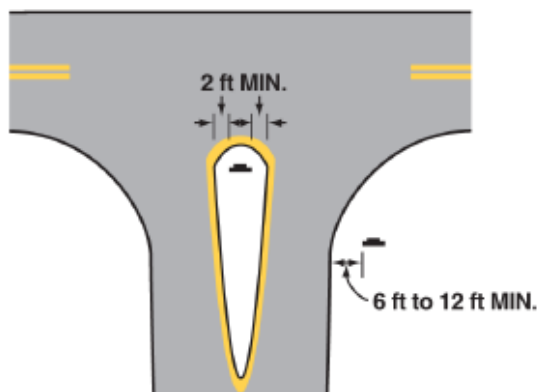
B - CHANNELIZED INTERSECTION



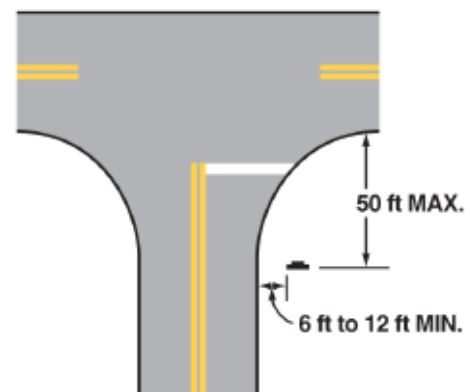
C - MINOR CROSSROAD



D - URBAN INTERSECTION



E - DIVISIONAL ISLAND



F - WIDE THROAT INTERSECTION

Note: Lateral offset is a minimum of 6 feet measured from the edge of the shoulder, or 12 feet measured from the edge of the traveled way.

Image Source: MUTCD

Sign supports/posts must be breakaway so that they yield when struck. A post is breakaway if it incorporates an intentional weak spot near the ground level. There are different methods of providing a breakaway design, depending on the type of post.

- ☑ Steel square posts become breakaway through the use of short section of a post embedded in the foundation. The short section is slightly larger than the post extending above ground to the sign. The pieces are bolted together, and the bolts shear if struck.
- ☑ U-channel steel bar posts are breakaway by installing a shorter piece of U-channel post in a concrete foundation and bolting it to a longer U-channel post extending up to the sign with overlap for a few inches above the ground level.
- ☑ Wood posts are breakaway by two drilled holes through the post, drilled perpendicular to traffic and with one above another.
- ☑ Round steel tube posts become breakaway by either using a post with such thin walls that the entire post is weak, or by using a short post in the foundation with a second post above ground. Both posts are bolted together with plates and the bolts become the weak point.



Common Breakaway Sign Posts

The table on the following page summarizes breakaway features for these types of posts.

Common Types of Breakaway Sign Posts, and Considerations

Steel square (common sizes include 1.75"x1.75", 2"x2", 2.25"x2.25" & 2.5"x2.5")	Steel channel bar (common sizes: 2.5 lb./foot, & 4 lb./foot)	Round steel tube (common sizes: 2 3/8" Diameter)	Wood posts (common sizes: 4"x4", 4"x6" & 6"x6")
Due to their closed cross section, these posts have great torsional resistance, and this eliminates most sign flutter in the wind.	May be less expensive than steel square posts.	Signs are generally U-bolted to this type of post, resulting in less torsional resistance	Should specify Yellow Pine or Douglas Fir pressure-treated lumber.
A sign post is inserted into a 1/4-inch larger size anchor post and is attached with one bolt.	Unlike square posts, these posts have an open cross section that lacks torsional resistance, which allows signs to flutter in the wind.	Steel posts are breakaway through the use of a short post in the foundation with a second post above ground. Both posts are bolted together with plates and the bolts become the weak point.	Generally, require a concrete foundation to satisfy national breakaway criteria, thus making replacement problematic.
Signs can be mounted on all four sides of the post.	Because sign posts twist back and forth both above and below the ground, over time the posts work loose in the soil and start to lean, creating an ongoing maintenance problem.	Alternatively, use a post with such thin walls that the entire post will be weak.	All posts above 4 x 4 inch nominal size must be drilled perpendicular to traffic flow to allow the post to break away if struck by a motor vehicle.
Posts of this type are also considered breakaway if they are 2 1/4 inches or less in size.	A bar weighing 3 pounds-per-foot or less meets breakaway requirements by itself, being a weaker post.		Posts sometimes warp or curl as they weather.

Anchor posts should never extend more than 4 inches above the ground to minimize the chance of the anchor post snagging the undercarriage of an impacting vehicle.

For steel square posts and steel channel bar posts, the post supplier should provide: (1) certification regarding FHWA's approval, including the maximum number of sign posts that are allowed within a 7-foot path; (2) documentation showing the maximum sign area that the posts will support at various sign heights, based on the locale's design wind and soil conditions; and (3) proper installation instructions.

Location and Spacing

Another common deficiency is the improper location of a sign (whether the sign itself is correct or not). Signs, whether they be regulatory, or warning, have requirements for correct placement. Guide signs may not have the same requirements, but they must be located correctly for maximum effectiveness.

Common regulatory signs include traffic control signing, Speed Limit, or DO NOT ENTER/WRONG WAY signing.

- ☑ Traffic control signing, including STOP or YIELD signs, are most frequently used at intersections. They must be located such that they are visible to approaching traffic.

- It may be necessary to locate the STOP sign slightly farther from the intersection before the intersection corner radius. Getting closer to the cross street, the road edge gets farther from the approach roadway.
- Consider increasing visibility to a STOP or YIELD sign by adding a second sign to the left-hand side of the approach.
- ☑ Speed Limit signs should be located as follows:
 - After major intersections
 - At locations where a change in speed limit occurs.
 - Also, they should be located at a maximum of 1-mile spacing for speed limits of 35 mph or lower, and maximum 3-mile spacing for higher speed limits.
- ☑ DO NOT ENTER signing should be located at the intersection, visible as if a vehicle would be turning the wrong way onto the roadway.
 - The WRONG WAY sign should be installed past the turning point, to provide additional warning in case a vehicle actually turns the wrong way onto the roadway.

Warning signs should be installed at a distance to provide adequate time for proper response. The distance is based on two parts – to provide proper time for the motorist to react, and distance to decelerate. These vary based on the initial travel speed and the travel speed at the location of the hazard. The MUTCD shows these distances. The distances are less than previous versions of the MUTCD, and were changed due to brighter sign sheeting requirements, as well as brighter headlights which are currently more common on today's vehicle fleet than was the case years ago. Using these distances will locate a warning sign properly approaching a condition requiring warning. See the MUTCD Table 2C-4 "Guidelines for Advance Placement of Warning Signs", or the [Better Military Traffic Engineering \(BMTE\) calculator](#).

Guide signs must also be located to provide adequate time for proper response. On military installations, a common guide sign is a ladder style destination sign. These provide information on the location of certain destinations on base. They should be located in advance of key intersections where drivers would need to turn to get to the destination. Specifically, they should be located before the turn lane starts, so as to give enough time for a driver to change lanes and prepare for the turn. Guide signs

should be limited to no more than three destinations. If destinations must be eliminated, consider eliminating those that do not require a turn at that specific intersection, or use multiple signs posted at properly spaced intervals.



Ladder Style Guide Sign with Too Many Destinations. No destinations require turning at the intersection

Signs must be spaced properly in order to be read and understood by drivers. As a rule, space signs at intervals of at least 200 feet (preferably) from other signs, with an allowance to use 100 feet minimum for speeds 35 mph and lower.

Another aspect of signs not being spaced correctly is the use of the same post for different types of signs. There are some types of signs that must be mounted together, such as an ALL WAY plaque mounted beneath a STOP sign, or an advisory speed plaque mounted below a Horizontal Alignment warning sign. There are other examples, but other signs not intended to be grouped are often observed together on military installations. The intent could be to save a post, or it could be due to limited space. In these cases, if both signs are needed, the sign of lesser importance should be relocated or eliminated if possible. Page 9 shows an example of a correct use of an advisory speed placard mounted with a horizontal alignment sign. It also shows a photo of a Speed Limit sign mounted above a nonstandard SLOW – CHILDREN PLAYING sign, which does not require action by the driver, and is therefore not recommended even if it were on its own post.

Warning Sign Placement Distance

Posted or 85th-Percentile Speed	Advance Placement Distance ¹								
	Condition A: Speed reduction and lane changing in heavy traffic ²	Condition B: Deceleration to the listed advisory speed (mph) for the condition							
		0 ³	10 ⁴	20 ⁴	30 ⁴	40 ⁴	50 ⁴	60 ⁴	70 ⁴
20 mph	225 ft	100 ft ⁶	N/A ⁵						
25 mph	325 ft	100 ft ⁶	N/A ⁵	N/A ⁵					
30 mph	460 ft	100 ft ⁶	N/A ⁵	N/A ⁵					
35 mph	565 ft	100 ft ⁶	N/A ⁵	N/A ⁵	N/A ⁵				
40 mph	670 ft	125 ft	100 ft ⁶	100 ft ⁶	N/A ⁵				
45 mph	775 ft	175 ft	125 ft	100 ft ⁶	100 ft ⁶	N/A ⁵			
50 mph	885 ft	250 ft	200 ft	175 ft	125 ft	100 ft ⁶			
55 mph	990 ft	325 ft	275 ft	225 ft	200 ft	125 ft	N/A ⁵		
60 mph	1,100 ft	400 ft	350 ft	325 ft	275 ft	200 ft	100 ft ⁶		
65 mph	1,200 ft	475 ft	450 ft	400 ft	350 ft	275 ft	200 ft	100 ft ⁶	
70 mph	1,250 ft	550 ft	525 ft	500 ft	450 ft	375 ft	275 ft	150 ft	
75 mph	1,350 ft	650 ft	625 ft	600 ft	550 ft	475 ft	375 ft	250 ft	100 ft ⁶

Notes:

1. The distances are adjusted for a sign legibility distance of 180 feet for Condition A. The distances for Condition B have been adjusted for a sign legibility distance of 250 feet, which is appropriate for an alignment warning symbol sign. For Conditions A and B, warning signs with less than 6-inch legend or more than four words, a minimum of 100 feet should be added to the advance placement distance to provide adequate legibility of the warning sign.
2. Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing the driver a PRT of 14.0 to 14.5 seconds for vehicle maneuvers (2004 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 180 feet for the appropriate sign.
3. Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Warning signs. The distances are based on the 2004 AASHTO Policy, Exhibit 3-1, Stopping Sight Distance, providing a PRT of 2.5 seconds, a deceleration rate of 11.2 feet/second², minus the sign legibility distance of 180 feet.
4. Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second PRT, a vehicle deceleration rate of 10 feet/second², minus the sign legibility distance of 250 feet.
5. No suggested distances are provided for these speeds, as the placement location is dependent on site conditions and other signing. However, the alignment warning sign should be installed in advance of the curve and at least 100 feet from any other signs.
6. The minimum advance placement distance is listed as 100 feet to provide adequate spacing between signs.

Source: FHWA, MUTCD Table 2C-4

Sign Size

Signs have different required sizes for different applications. In general, conventional multi-lane roads with higher travel speeds require larger size signs than conventional single lane roads with slower speeds. Also, some size requirements have changed as versions of the MUTCD have been released. For example, an 18x24 Speed Limit sign was acceptable at one time on single lane conventional roads; the current requirement is 24x30. The table in the top right is a partial table of the required sizes for regulatory signs. The sizes can differ by type of roadway. For the complete table, see Chapter 2B of the MUTCD. There is a similar table for warning signs in Chapter 2C. Note that the required sizes are the minimums; larger sizes could be used if situations require it.

Regulatory Sign Sizes (Partial Table)

Sign or Plaque	Sign Designation	Section	Conventional Road	
			Single Lane	Multi-Lane
Stop	R1-1	2B.05	30 x 30*	36 x 36
Yield	R1-2	2B.08	36x36x36*	48x48x48
To Oncoming Traffic (plaque)	R1-2aP	2B.10	24 x 18	24 x 18
All Way (plaque)	R1-3P	2B.05	18 x 6	18 x 6
Yield Here to Peds	R1-5	2B.11	—	36 x 36
Yield Here to Pedestrians	R1-5a	2B.11	—	36 x 48
Stop Here for Peds	R1-5b	2B.11	—	36 x 36
Stop Here for Pedestrians	R1-5c	2B.11	—	36 x 48
In-Street Ped Crossing	R1-6,6a	2B.12	12 x 36	12 x 36
Overhead Ped Crossing	R1-9,9a	2B.12	90 x 24	90 x 24
Except Right Turn (plaque)	R1-10P	2B.05	24 x 18	24 x 18
Speed Limit	R2-1	2B.13	24 x 30*	30 x 36
Truck Speed Limit (plaque)	R2-2P	2B.14	24 x 24	24 x 24
Night Speed Limit (plaque)	R2-3P	2B.15	24 x 24	24 x 24
Minimum Speed Limit (plaque)	R2-4P	2B.16	24 x 30	24 x 30
Combined Speed Limit	R2-4a	2B.16	24 x 48	24 x 48
Unless Otherwise Posted (plaque)	R2-5P	2B.13	24 x 18	24 x 18
Citywide (plaque)	R2-5aP	2B.13	24 x 6	24 x 6
Neighborhood (plaque)	R2-5bP	2B.13	24 x 6	24 x 6
Residential (plaque)	R2-5cP	2B.13	24 x 6	24 x 6
Fines Higher (plaque)	R2-6P	2B.17	24 x 18	24 x 18
Fines Double (plaque)	R2-6aP	2B.17	24 x 18	24 x 18
\$XX Fine (plaque)	R2-6bP	2B.17	24 x 18	24 x 18
Begin Higher Fines Zone	R2-10	2B.17	24 x 30	24 x 30
End Higher Fines Zone	R2-11	2B.17	24 x 30	24 x 30
Movement Prohibition	R3-1,2,3,4,18,27	2B.18	24 x 24*	36 x 36

Image Source: MUTCD



Correct Example of Two Signs on One Post



Example of Speed Limit sign with Unrelated Sign

Sign Colors

Another common deficiency on military installations is improper sign color usage. Regulatory signs typically use black legends and border on a white background, but also include a white legend and border on a red background (STOP, YIELD, DO NOT ENTER, AND WRONG WAY). Warning signs are typically black symbols, legend, and border on a yellow or fluorescent yellow-green background (school zones). An orange background with black legend or symbol is used for construction zones. Military installations tend to use brown as a color for speed limit signs and handicapped parking. Incorrect colors make the sign unenforceable, and they detract from the driver's expectation for how they are to react to the sign.

Other common problems can include using yellow for speed limit sign backgrounds or using red for non-prohibitive regulatory conditions.

The use of brown paint on the back of a sign is common on military installations as well. While technically not deficient, painting the back of signs is unnecessary and costly. Painting the back of a sign a dark color allows the sign to absorb more heat, degrading the sheeting faster. The plain aluminum back would reflect more heat.



Example of Incorrect Color for Speed Limit Sign

Obsolete Signs

Periodically, changes to required signing are incorporated into new editions of the MUTCD. New signs are developed to replace older versions. When changes such as these are published in the MUTCD, a period of compliance accompanies it. The length of time before the required compliance can be a function of relative importance, as well as the relative burden on agencies to adopt the changes. That said, as of 2023, all periods of compliance for updates required by the 2009 MUTCD are expired, therefore all changes are in effect.

The 2009 MUTCD has several notable changes versus preceding editions. Despite the length of time since these newer versions were introduced, the obsolete versions are frequently still observed on installations. These include:

- ☑ Replacing of the older 4-WAY plaques with ALL WAY for multiway stop controlled intersections
- ☑ Replacing the former REDUCED SPEED AHEAD regulatory sign with a warning sign showing the new speed limit sign with an advance arrow
- ☑ Changing the stencil of the merge sign to show a dotted line beneath the lane ending.
- ☑ Requiring the fluorescent yellow-green color for the pennant shaped School Crossing sign. Additionally, horizontal lines representing the crosswalk were eliminated from the sign in lieu of using the diagonal downward arrow placard.

In addition to these, a change in certain signing conditions included the requirement to mount a STOP or YIELD sign at railroad grade crossings lacking active warning systems.

The graphic on the following page shows the old versus new versions of these signs.

Obsolete Version	Current Version
 R1-3	 R1-4
 R2-5a	 W3-5
 W4-2	 W4-2
 S1-1  W16-7p	 S1-1  W16-7P
 W11-2	 W11-2

Images Source: MUTCD

Faded and Non-Retroreflective Signing

Sign visibility is extremely critical for the driver to recognize and understand the message. When signs are faded or non-retroreflective, they lack this visibility. Faded signs lack visibility, and non-retroreflective signs lack

visibility at night. Either of these indicate that a sign must be replaced. The typical sign life for proper visibility and retroreflectivity is 12-15 years. Harsh conditions, such as exposure to intense sun, can accelerate this. Signs may require maintenance other than replacement. For example, signs in the Pacific Northwest can grow moss on the face, which can reduce the visibility and retroreflectivity on an otherwise good sign. This can be mitigated simply by cleaning. Connections can become loose, particularly if regularly exposed to high wind conditions. A sign should be replaced when any of the following occur:

- ☒ It reaches the end of its service life
- ☒ It fades excessively
- ☒ It is damaged or vandalized
- ☒ It is struck by a vehicle
- ☒ The condition requiring signing is improved



Example of Faded STOP sign



Example of Faded Sign



Example of Faded Sign. Also, note that the background was used for another sign previously.

Blanket Speed Postings

Blanket speed limit postings must be applied in accordance with State law. It is often desired to apply a blanket speed limit for the purposes of consistency throughout the base, as well as the hopes to minimize the need to install speed limit signing.

Blanket speed limits are permitted based on the 2009 MUTCD, but some states do not allow them. Consult your state's motor vehicle code and MUTCD, if available, to determine if blanket speed limits are permitted.

A blanket speed limit could either be posted at the entrance of the installation after the ECF, or at more localized areas such as at the entrance to a housing area. If this type of speed limit is used, it should be signed with an R2-5iP-TEA, **INSTALLATION** (or R2-5cP, **RESIDENTIAL** or R2-5hP-TEA, **BASE**) plaque; an R2-1, **SPEED LIMIT** sign; and an R2-5P, **UNLESS OTHERWISE POSTED** plaque as shown to the right. See the *DoD Supplement to the MUTCD* published by TEA.



R2-5iP, R2-1, R2-5P

Excessive and Irrelevant Signs at ECFs

Excessive and irrelevant signs are often found at ECFs. These can range from welcome signing, wordy regulation signing, tobacco use, drone use, directional signing, mixed with signing relating to the ECF itself.

An ECF is a complex area which requires significant attention by drivers. Drivers must balance their attention between the access needs, congestion, potential for lane closures at the checkpoint, and signing for traffic conditions. They must also pay attention to the traffic control at the active vehicle barrier and the potential for its activation. Adding unnecessary signs to the ECF area creates unnecessary distraction may cause motorists traveling through the ECF to overlook important signs.

It is recognized that there are reasons to install announcement-related signing at ECFs since all traffic to the installation enters through a limited number of locations, but due to the complexity of the driving task in this area, it is not recommended.

TEA's position is that if these signs must remain in place at the installation ECFs, they should be offset farther from the edge of the road edge to leave the space closer to the edge of the road for traffic-related signing, and to not detract from the visual requirements through the ECF.



Example of Multiple Signs in ECF Approach

Develop a Sign Management System (SMS)

The Transportation Engineering Agency can perform SMS studies for installations. A SMS is an important tool to help installations manage their signs and has three primary benefits:

1. A SMS for installations has not only the records of existing signing, but also recommends changes to signing in place. This can relate to better ways of signing for conditions, or changes to upgrade signing compliance.
2. It provides a method to replace signs to maintain the retroreflectivity requirements
3. A SMS provides a record of the signing that is in place in the event that a sign or multiple signs go missing. Without such a record, it can be difficult to know what sign(s) must be installed within a particular area. If a sign is missing, the SMS can be referenced to identify the correct sign to install.

When a sign reaches the end of its life, it must be replaced. A SMS helps track the expected life and helps schedule replacement.

When assessing the condition of a sign, a faded sign can be easily noted during the day. A non-retroreflective sign is observed at night. The FHWA has identified multiple methods of maintaining minimum retroreflectivity. These methods relate to assessment methods and management methods. Sign assessment methods evaluate the condition of each individual sign, while management methods are based on an assumed sign life. One of these methods should be used to evaluate the retroreflective condition of the signing.

The assessment methods include:

- ☑ Visual Nighttime Inspection. Inspect all signs at night by a trained sign inspector, driving at normal speeds and using low beams. The inspector should be 60 years or older and should evaluate the signs from the normal viewing distance. The vehicle should be a 2000 model year or newer SUV or pick-up truck. Replace defective and marginally acceptable signs.
- ☑ Measured Sign Retroreflectivity. Periodically measure the retroreflectivity of sign backgrounds



Example of Multiple Signs on One Post in ECF Response Zone

and retroreflective legends. Replace the individual signs with substandard retroreflectivity values.

The management methods include:

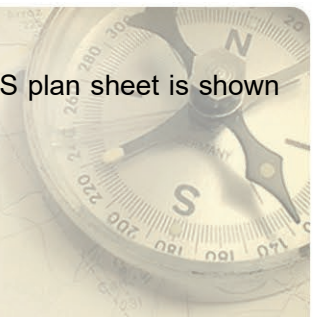
- ☑ Expected Sign Life. Replace individual signs based on the age of the sign and the expected sign life. To track the installation date, maintain a sign inventory or identify the year of installation on the back of the signs.
- ☑ Blanket Sign Replacement. Replace all signs on the installation or area within the installation at the same time using the previous replacement date and the expected sign life. (A variation could be, replace all STOP signs in Year #1, Speed Limit signs in Year #2, other regulatory signs in Year #3, etc.)
- ☑ Control Signs. Replace individual signs based on measured retroreflectivity of signs that represent the general population of signs purchased and installed in the same basic time frame. The control signs can either be installed in the field or in another location such as in a maintenance yard but should face south in the northern hemisphere.

The use of one of these methods is important to ensure proper retroreflectivity of installation signing. When replacing signing, it is important to ensure that a minimum Type III sheeting is used to ensure an adequate retroreflectivity level that lasts for several years.

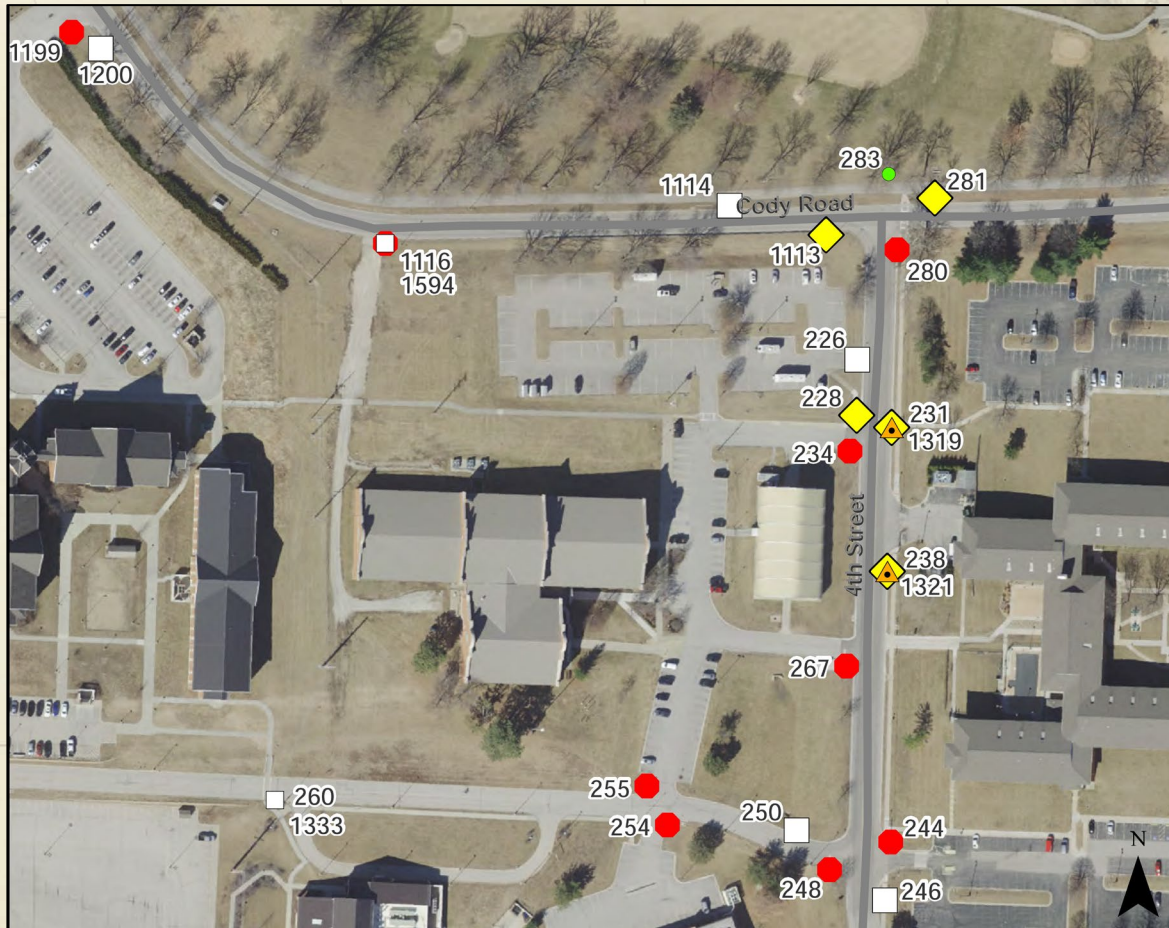
A SMS should also include details on location, mounting height, presence of barrier or curb, and position with respect to traffic. It assesses the sign post, specifically if it has breakaway properties or not. It also assesses the actual sign, including the sign message, shape and size, background, and legend colors, versus the standards. The study makes recommendations and changes necessary to the sign message and its placement. It also recommends if a sign should simply be removed, or if a location requires that a sign be added.

The product is a GIS database of all signs inventoried, containing a GPS point and all features collected, plus a photo of the sign. The intent is for the installation to keep the database current. If a sign is replaced, the database should be updated. If a project adds or removes signing, the database should be updated to remain current. Often included with the SMS are plan sheets showing each sign and if it has a priority level for replacement. This could be given to maintenance staff or a contractor for ease of sign

replacement. An example of a SMS plan sheet is shown on the next page.



SMS Plan Sheet Example



Signs

SignID	Primary Sign	Proposed Sign	Proposed Post	MUTCD Sign Type	MUTCD Series Number	Existing/Proposed Sign Size	Sign Replacement Size	Post Breakaway	Replace Sign	Remove Sign	Standard Regulatory/Warning/ Sign Comments	Reflectivity Condition
226	Yes	No	No	Regulatory	R2-1 Speed Limit	24X30		Yes	No	No		Good
228	Yes	No	No	Warning	W11-2 Pedestrian	30X30		Yes	No	No		Good
231	Yes	No	No	Warning	W11-2 Pedestrian	30X30		Yes	No	No		Good
234	Yes	No	No	Regulatory	R1-1 Stop	30X30		Yes	No	No		Good
238	Yes	No	No	Warning	W11-2 Pedestrian	30X30		Yes	No	No		Good
244	Yes	No	No	Regulatory	R1-1 Stop	30X30		Yes	No	No		Good
246	Yes	No	No	Regulatory	R2-1 Speed Limit	24X30		No	No	No		Good
248	Yes	No	No	Regulatory	R1-1 Stop	30X30		Yes	No	No		Good
250	Yes	No	No	Regulatory	R2-1 Speed Limit	12X18		No	No	No	Not a formal road but appears to function as one	Poor
254	Yes	No	No	Regulatory	R1-1 Stop	24X24		Yes	No	No		Poor

Mr. Bruce A. Busler, SES
Director, Transportation Engineering Agency

Contact Us

TRANSPORTATION ENGINEERING AGENCY (TEA)

1 Soldier Way
Scott Air Force Base, Illinois
62225-5006

COMM: 618-817-8549

DSN: 322-817-8549

EMAIL: army.sddc.safb.traffic@mail.mil

WEBSITE: <http://www.sddc.army.mil/sites/tea>
for pamphlets, bulletins, and studies

Reference List

- ☑ [TEA Home](#)
- ☑ [*Better Military Traffic Engineering*, SDDCTEA Pamphlet 55-17. 2016.](#)
- ☑ [Addendum to SDDCTEA Pamphlet 55-17, *Crosswalk Warrant and Guidelines*, 1 December 2020.](#)
- ☑ [Federal Highway Administration: *Manual on Uniform Traffic Control Devices*, 2009 Edition \(with Revision Numbers 1, 2, and 3\)](#)
- ☑ [Federal Highway Administration: *Standard Highway Signs and Markings*, 2004 Edition with 2012 Supplement](#)
- ☑ [DOD Supplement to the MUTCD, TEA, 2015](#)

The use of these resources is strictly for educational purposes. The use of any resource, publication, or image in this Bulletin shall not constitute an endorsement (express or implied), by HQ SDDC, AMC, the United States Army, the Department of Defense, or any other government instrumentality.

Use of any TEA created content and images within this Bulletin require attribution to our publication.