

M A S S INTERCHANGE

Volume 13, Number 2

Spring 1999

Sign, Sign, Everywhere a Sign

Sign Installation

To be effective, follow roadway design and alignment in placing signs. Generally, locate signs on the right-hand side of the roadway. For special emphasis, use duplicate signs opposite each other on both sides of the road.

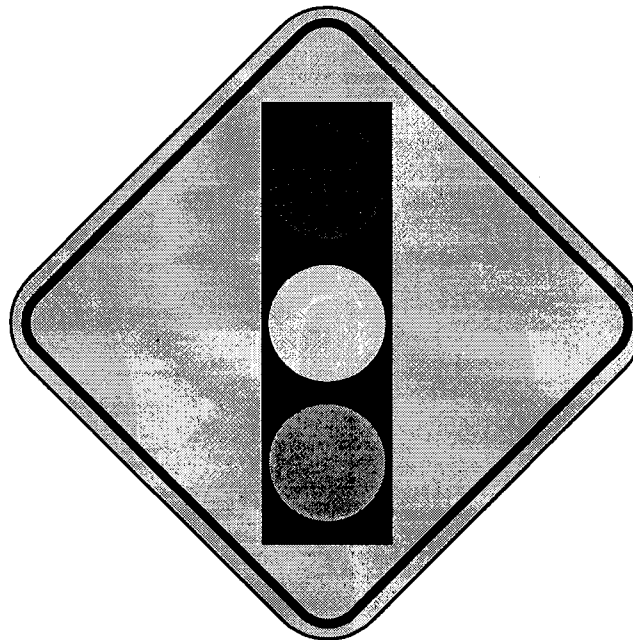
In rural areas, mount the signs at least five feet above the pavement (measured from the sign bottom). In business, commercial, and residential districts, or where parking or pedestrian movement is likely to occur, the sign should be at least seven feet above the ground level.

In general, you should not place two or more signs on the same pole if they carry unrelated messages. Two signs with related messages can be placed together (e.g. a CURVE sign with a speed advisory). In this case, the bottom sign may be mounted one foot below the normal minimal height.

Normally, signs should be at least

twelve feet from the edge of the pavement. In cities, they may be closer where road width is limited or where existing poles are close to the curb. Be careful that there are no shrubs, trees, utility poles, or other objects in

calculate the advance distance. Regulatory signs normally go where the prohibition applies (stop signs at corners, for example) or begins (speed limit signs at the start of the speed zone).



front of the sign to obscure its message.

Place warning signs ahead of the condition they describe, using roadway condition and posted speed to

Place guide signs where they are needed, usually before the decision point, to keep drivers informed of their route.

Mount signs vertically at a right angle facing the traffic they serve. Where there is a reflection or glare from the sign face, turn it slightly away from the road. All regulatory, warning, guide, and construction signs applicable at night must be reflectorized or illuminated to show the same shapes and colors day and night.

Sign Posts

Don't make the sign posts too strong. Whether they're wood or steel, the posts you use to hold up small traffic signs shouldn't be too big. This protects vehicle drivers who may crash into them. Federal Highway Administration crash tests show that treated pine nominal 4 by 4 inch

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posts, nominal 4 by 6 inch posts with 1 1/2 inch bored holes are acceptable in new installations as small sign supports for all speed conditions. Standard 2 inch diameter steel pipe is not acceptable on high speed roads. Steel flange channel U-posts of three pounds per foot are marginal, depending on steel type.

Use multiple posts spaced 7 feet or more apart to support larger-than-average signs, rather than using heavier posts or poles.

Wood posts are bulky, heavy to handle and need an auger to dig the hole for them. When they're hit they usually splinter and go down. But they are stiffer and longer than metal posts. These wooden posts can also hold signs on different sides. Wood should be treated with copper arsenate or an acceptable preservative.

Steel posts can be driven with a post driver. They're easy to store. Channel posts are usually punched with holes, making it easy to attach signs. Metal pipe posts should be set in concrete so they don't twist in the ground. Splicing standards for U-posts are under review.

Markings

Pavement markings are painted centerlines, edge lines, crosswalks, and special messages. Markings have definite and important functions in traffic control. Sometimes they supplement the regulations or warn-



A Non-Computerized Sign Inventory Method

So you want to keep track of all your roadside signs, but you don't want to use a computer program? The following method from Thomas Szebenyi (computer specialist with the Cornell Local Roads Program) can be used:

Create a file of 4 x 6 cards and lay each card out as follows:

DATE: (today)
ROAD: (name)
DIRECTION OF TRAVEL:
STARTING POINT:
LOCATION: (from reference starting point)
MUTCD SIGN CODE: (see MUTCD; not essential)
TEXT ON SIGN:
SIZE: (width x height, and cost)
PLACEMENT: (left, right, center, overhead)
POINTING WITH DIRECTION: (forward, reverse)
SUPPORT TYPE AND COST: (steel channel, pipe, etc.)
DATE INSTALLED:

On the back of each card you can then record:

INSPECTION DATE:
CONDITION OF SIGN:
DEFECTS:
DATE OF WORK ORDER:
WORK ORDER PURPOSE:
DATE WORK COMPLETED:

This was excerpted from Nuggets and Nibbles, Cornell Local Roads Program, Winter 1994

ings of other traffic control devices. Used alone, they can produce results that other devices can't -- effectively designating a lane, locating the road center, and locating a stopping point. This is information that could not otherwise be understandable.

Only use centerline painting on roadways over 16 feet wide which carry sufficient traffic to warrant the cost. If the centerline is marked, it must also have no passing zones established in accordance with the MUTCD.

Pavement markings have limitations. They are obliterated by snow, may not be clearly visible

when wet, and are not very durable under heavy traffic. Despite these limitations, they can convey warnings or information to the driver without diverting his or her attention from the roadway.

This article has been reprinted with permission from the Wisconsin LTAP Center and originally published in Wisconsin Transportation Bulletin, July 1992.

Standards for Street Name Signs

The *Institute of Transportation Engineers (ITE) Journal* for May 1992, contains an article written by Robert B. Carroll entitled "Street Name Sign Practices." The article is a summary of a report by ITE Technical Council Committee 4A-26 to review the street name signing practices in the United States and Canada. The study concludes that agency interpretation of the *Manual on Uniform Traffic Control Devices (MUTCD)* and signing practices differ widely.

The study also found that agencies give street name signs the lowest priority for sign maintenance. Street signs help people know where they are and help them find their destination. They also assist emergency vehicle drivers to quickly find an address. The potential liability associated with these two purposes is viewed as low by most agencies. Most drivers have a low expectancy for street name signs; therefore, agencies receive the fewest complaints on street name signs.

What are the standards for street name signs? Street name signs have standards for shape, size, color, retroreflection, and placements. Agencies have taken many liberties in the interpretation and recommendations on the standards in the *MUTCD* Section 2D-39 Street Name Sign (D3).

Shape

A rectangle with the longer dimension horizontal.

Color

White letters on a green background.

Size

The *MUTCD* states, "Lettering should be at least 4 inches high and supplementary lettering to indicate type of

Continued on Page 5...

"Strong" Warning Signs

It is now permissible to allow the use of **strong yellow-green fluorescent** warning signs on public roads in Maine. Up to this time, national standards, as described in the *Manual on Uniform Traffic Control Devices (MUTCD)*, only allowed the use of yellow as the background color for permanent warning signs such as curve signs, pedestrian signs, school zone signs, etc.

As of June 19, 1998, the *MUTCD* has been amended to include the *optional use* of these fluorescent signs for pedestrian, bicycle, and school applications. Specifically, the allowable signs include the following:

- Advance Pedestrian Crossing (W11-2)
- Pedestrian Crossing (W11A-2)
- Bicycle Crossing (W11-1)
- School Advance Sign (S1-1)
- School Crossing (S2-1)
- School Bus Stop Ahead (S3-1)



No other applications are allowed for the use of this very strong color. The intent of this unique color is to increase the driving public's awareness of crosswalks, schools, and bicycle areas. If the color was allowed for other "regular" warning applications, the color would grow "old" very fast and would not command as much attention.

The initial cost of purchasing one or more of these signs is more than a conventional engineering grade sheeting. A town which decides to erect some of these signs at certain areas in town will pay a higher initial price for the fluorescence. The payoff is a sign which has been shown to be more visible and which may result in better motorist recognition, thus reducing vehicular-pedestrian conflicts.

It's worth trying some of these signs if your town has a typical pedestrian/vehicle conflict on some of its roads. This color has been received positively as an accepted and innovative tool to provide for increased pedestrian safety. The more common approach of putting a barrel or cone in the middle of the road with metal signs, boulders, sandbags, etc. is a nonuniform, nonstandard, and potentially harmful device which may appear to provide "safety" but could lead to some serious negative consequences.

This article was featured in Maine Local Roads News, December 1998 issue and reprinted with permission from the Maine LTAP Center.

"Children At Play" Signs Do Not Give a Clear Message!

Road signs give messages to drivers. If the messages are unclear, unnecessary, or confusing they can cause danger to motorists and others. The *Manual on Uniform Traffic Control Devices (MUTCD)* is the standard for placing traffic signs and markings to

sign is present on another street, children are not playing there, and it is OK to speed or to be less careful. Another driver might interpret the sign to mean that children are playing in the road. Always? What time of day?

prevent injury or decrease the speed of vehicles.

Sixth, because they are confusing and do not meet specific criteria for good signing, placing **Children at Play** signs opens the municipality to tort liability.

Seventh, since all signs need to be maintained to be effective, the proliferation of unnecessary signs places an undue burden on maintenance crews. Purchasing, erecting and keeping these signs in good order is expensive.

For these reasons, the *MUTCD* discourages the use of **Children at Play** signs. However, municipalities can and should post signs for school zones, pedestrian crossings, and playgrounds. The *MUTCD* makes specific reference to these situations. Signing such areas gives clear messages to drivers about the kind of zone they are entering. **Children at Play** signs, on the other hand, do not meet a specific criteria.

Article from Vermont Local Roads News, June 1994, reprinted with permission of Vermont LTAP Center.

"...there is no evidence that **Children at Play** signs prevent injury or decrease the speed of vehicles."

give clear messages to motorists.

According to the report "Maintenance Management of Street and Highway Signs" by the Transportation Research Board, improvements in traffic signing have the highest benefit-cost ratio of any highway safety improvement. About 29% of tort liability lawsuits against highway departments are related to traffic signing. For these reasons alone it is worthwhile to install road signs according to the *MUTCD*.

Citizens often demand that the town erect **Children at Play** signs on their street to reduce the risk of automobile-pedestrian accidents. Selectmen ask: What does the *MUTCD* say about **Children at Play** signs? If we erect a sign on one street, won't we get requests from other neighborhoods in town to do the same? What's the town's liability?

The short answer is: "Do not erect **Children at Play** signs." The long answer is a bit more complicated. First, the **Children at Play** sign is unclear and unnecessary. It suggests to the driver that, if no such

Second, it gives parents and children a false sense of security. By relying on the sign, parents might monitor their children less closely and children might interpret the sign to mean it is acceptable to play in the street.

Third, one **Children at Play** sign leads to a proliferation of signs throughout the town. Since nearly every block has children living on it, there would have to be signs on each one. The effect of too many signs is that they become ineffective. The proliferation of signs breeds disrespect, not only for the specific signs, but for all signs.

Fourth, to erect **Children at Play** signs in response to one request usually generates similar requests, thereby basing sign placement on politics rather than on sound traffic engineering judgement.

Fifth, based on numerous studies, there is no evidence that **Children at Play** signs



Baystate Roads:

Plan Reading	May 18, 1999	Hotel Northampton, Northampton
Sign Inventory Management Systems	April 23, 1999 May 20, 1999	Fisher College, Plymouth City Training Center, Framingham
Hot Mix Asphalt Pavement	April 28, 1999	Holiday Inn, Taunton

Massachusetts Highway Association

Public Works Education Conference and Annual Meeting	May 5-6, 1999	Crowne Plaza Hotel, Worcester
Contact: Jerry Daigle (508) 883-6624		

Pioneer Valley Planning Commission:

Pedestrian Safety Conference	May 19-21, 1999	PVPC Headquarters, W. Springfield
Contact: Josh Lehman (617) 973-7329		

Local Women's Transportation Seminar

June 11, 1999	Crowne Plaza, Worcester
Contact: Mary Kate McDonald (508) 754-7204	

National Women's Transportation Seminar May 5-7, 1999
(617) 367-3273 or register on-line at www.wtsnational.org

...continued from Page 3.

street or section of city may be smaller lettering, at least 2 inches high." This should be considered the absolute minimum. Street name signs placed overhead on signal standards are usually much larger. The *MUTCD* allows the use of upper and lower case letters for guide signs when the letter height exceeds 8 inches. The vertical dimension of the sign is dependent upon the vehicle speed of the highway or street. The letter height of the sign is also dependent upon the vehicle driver's visual acuity. The old rule of thumb for sign legibility distance of 50 feet for each inch of the letter height is currently being questioned. Some people think a better criterion would be 1 inch per 30 feet of distance.

Placement

The sign should be placed in accordance with the general mounting requirements in the *MUTCD*. The location of the sign and number of signs per intersection is agency dependent. The *MUTCD* states in Section 2D-39, "Street name signs should be erected in urban areas at all street intersections...and should be erected in rural districts to identify important roads not otherwise marked." Most agencies develop a system for consistent sign placement at intersections to help drivers easily find the signs.

MassHighway does not allow street name signs to be placed over stop signs in projects funded with Chapter 90 monies. The *MUTCD* Section 2B4 Stop Sign (R1-1) prohibits use of secondary messages on a stop sign face. (At one time, the words, "**ARTERIAL, FOUR WAY**" and other messages were placed on the sign face. They can

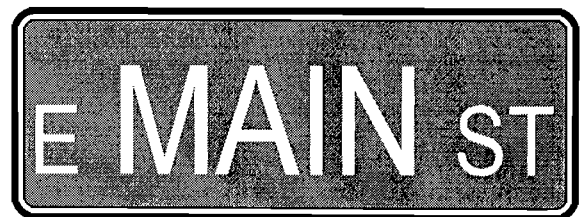
still be seen occasionally in small towns.)

Retroreflection

All street name signs should be retroreflective.

There are many reasons agencies vary from this standard. Some agencies deviate based on the town or section motif, some prefer different colors (blue and white primarily), and some allow old nonconforming signs to remain. A certain amount of deviation can be acceptable in some circumstances, but the basic function of the sign should always be retained.

This article provided from the Washington LTAP Center in The Bulletin, Vol. 36, Fall 1992.



Why Use the Manual on Uniform Traffic Control Devices, a.k.a. MUTCD?

Authorities have recognized for many years the need for uniformity in the meaning, design, usage, placement and maintenance of traffic control devices. The first *Manual On Uniform Traffic Control Devices (MUTCD)* was published in 1927. The Federal Highway Administration regularly updates and publishes this manual which gives the standards for all highways. The current *Manual on Uniform Traffic Control Devices* was published by the Federal Highway Administration in 1988.

The *MUTCD* provides the basic principles that govern the design, installation, and use of traffic control devices. It describes in figures and text the need for and placement of traffic control devices in normal situations. The manual does not cover every situation and should not substitute for sound judgement. The *MUTCD* often outlines the decision process to follow before you install or remove a traffic control device. This helps increase uniformity of signs and markings between local highway authorities.

When local authorities use the *MUTCD*, local roads are more constantly signed and marked. Since drivers expect consistency, this makes roads safer. Consistently following the *MUTCD* should decrease local governments' liability in lawsuits over roadway crashes.

Principles

To use the *MUTCD* effectively you should understand some basic principles of good operating practices: driver expectations, positive guidance, and consistency.

Expectations

Drivers, like people in general, expect things to operate in certain ways. A person entering a dark room will expect to find a light switch near the door.

When the switch is in a different place, it takes the person longer to respond to what is actually there. Similar reactions occur when people drive. When a driver's expectation is incorrect, either it takes longer to respond properly or, even worse, the driver may respond poorly or incorrectly.

A driver expects the next section of road to be like the last one. Studies show that what a driver sees -- traffic control devices, narrow bridges, straight roads -- is what the driver expects for the next half-mile to mile. Driver expectations are affected not only by

tant to:

- clearly warn of the narrow bridge far enough in advance so drivers are prepared to watch for oncoming vehicles, and
- mark the narrow throat of the bridge with the hazard markers to help the driver steer onto the bridge approach while continuing to look ahead.

These signs are planned to give drivers effective information when they can use it best.

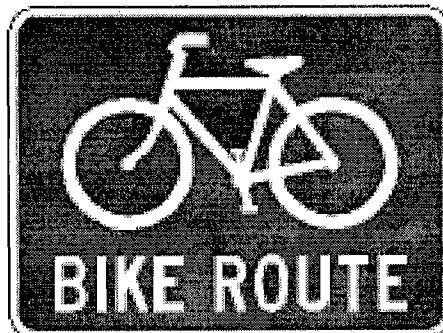
Consistency

Consistency means that the road, and the signs and markings used, are the same from one section to another. Sudden changes in the nature of the road are inconsistent and violate the driver's expectations. Examples of inconsistencies are: curve warning signs on some curves but not other similar curves, two lane roads suddenly narrowing to one lane over a bridge, a blacktop road changing to gravel, and a blind intersection in an area where most intersections can be seen clearly.

Being consistent with signs and markings -- using the same types in similar situations -- recognizes this principle and improves the effectiveness of these traffic control devices.

For a copy of the *MUTCD*, simply log on to <http://www.ohs.fhwa.dot.gov/devices/mutcd.html> and print.

This article has been reprinted with permission from the the Wisconsin LTAP Center and originally published in Wisconsin Transportation Bulletin, July 1992.



very recent experiences but also by past experience (for example, stop signs are red, curve warning signs are yellow). Using and placing traffic control devices consistently assures that the driver's expectations are correct.

Positive Guidance

Drivers can avoid hazards if they are given sufficient information where they need it and in a form they can use well. Combinations of signs, hazard markers, and, most importantly, the view of the road ahead, can give positive guidance. For example, if there is a narrow bridge on a curve and both are obscured by trees, it is impor-

publications and videos

PUBLICATIONS

<input type="checkbox"/> Traffic Control Handbook - Part IV Signals	TRA-25
<input type="checkbox"/> Sign Inventory Management System (SIMS)	COM-17
<input type="checkbox"/> Traffic Control Handbook for Low Volume Roads	TRA-02
<input type="checkbox"/> Minimum Retroreflectivity Requirements for Traffic Signs	SAF-57
<input type="checkbox"/> Maintenance of Small Traffic Signs	TRA-41

VIDEOS

<input type="checkbox"/> Signals: Read 'Em or Weep; The Choice is Yours	MO-128
<input type="checkbox"/> Sign Maintenance & Installation	MO-200
<input type="checkbox"/> Signs, Markings and Delineators	DC-127
<input type="checkbox"/> Positive Signs of Life; Let Your Safety Show	ST-100
<input type="checkbox"/> Traffic Signals Systems - Parts 1 & 2	ST-105
<input type="checkbox"/> Sign Management	ST-121
<input type="checkbox"/> Breakaway Sign Program	ST-137
<input type="checkbox"/> Traffic Sign Inspection and Maintenance	ST-151
<input type="checkbox"/> Traffic Sign Placement and Location	ST-152
<input type="checkbox"/> Traffic Control Signals at Intersections	ST-153
<input type="checkbox"/> Worldwide Traffic Sign Systems	ST-157
<input type="checkbox"/> Ramp Metering: Signal for Success	PA-121
<input type="checkbox"/> Positive Signs of Life	PA-132



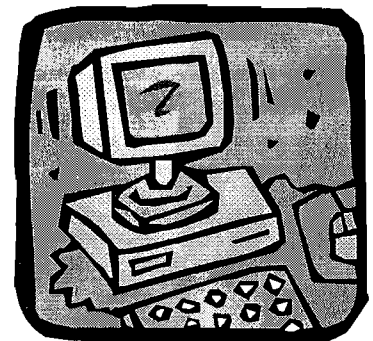
Please FAX your requests by code number to Baystate Roads at 413-545-6471 or call 413-545-2604.

Pick up your copy of the SIMS computer disks!

Thanks to the T² center at the University of New Hampshire, a computerized system of sign management is available for free to municipalities with access to a computer system. The SIMS (Sign Inventory Management System) Software is accompanied by a manual which helps the user to utilize all aspects of the software, including:

- Inventory
- Condition Assessment
- Repair Decisions
- Priority Analysis
- Repair Action Initiation
- Record Actions
- Parts Management

This very useful software is available from Baystate Roads at the same FAX number listed for Publications and Videos. For non-computerized recording systems, see the information box on page 2.





In this issue...

Sign, Sign, Everywhere a Sign	Page 1
Non-Computerized Sign Inventory	Page 2
Standards for Street Name Signs	Page 3
"Strong" Warning Signs	Page 3
Children at Play Signs	Page 4
Calendar	Page 5
Why Use MUTCD	Page 6
Publications and Videos/SIMS offer	Page 7

The Baystate Roads Program, which publishes *Mass Interchange* each quarter, is a Technology Transfer (T2) Center created under the Federal Highway Administration's (FHWA) Local Technical Assistance Program (LTAP). FHWA is joined by the Massachusetts Highway Department, the Department of Civil and Environmental Engineering at the University of Massachusetts/Amherst, and local public works departments in an effort to share and apply the best in transportation technologies.

In addition to publishing *Mass Interchange*, the Baystate Roads Program facilitates information exchange by conducting workshops, providing reports and publications and videotapes on request, and offering one-to-one technical assistance on specific roadway issues. Because the program relies on input from many sources, inquiries, articles, and ideas are encouraged.

LTAP Local Technical Assistance Program

To contact the Baystate Roads Program call (413) 545-2604 or FAX 413-545-6471.

8

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MASS HIGHWAY



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