



## WISCONSIN DEPARTMENT OF NATURAL RESOURCES NOTICE OF FINAL GUIDANCE & CERTIFICATION

Pursuant to ch. 227, Wis. Stats., the Wisconsin Department of Natural Resources has finalized and hereby certifies the following guidance document.

### DOCUMENT ID

PR-20-0001-C

### DOCUMENT TITLE

Regulatory and Warning Signs: Traffic Control Devices

### PROGRAM/BUREAU

Parks and Recreation Management

### STATUTORY AUTHORITY OR LEGAL CITATION

Under Wisconsin law, department roads open to the public for vehicular travel are considered "highways" (s.340.01(22), Stats.). Traffic control devices (such as signs) on DNR roads open for public use, must comply with state and federal standards.

### DATE SENT TO LEGISLATIVE REFERENCE BUREAU (FOR PUBLIC COMMENTS)

March 30, 2020

### DATE FINALIZED

June 1, 2020

No comments were received during the comment period of March 30, 2020 to April 20, 2020.

### DNR CERTIFICATION

*I have reviewed this guidance document or proposed guidance document and I certify that it complies with sections 227.10 and 227.11 of the Wisconsin Statutes. I further certify that the guidance document or proposed guidance document contains no standard, requirement, or threshold that is not explicitly required or explicitly permitted by a statute or a rule that has been lawfully promulgated. I further certify that the guidance document or proposed guidance document contains no standard, requirement, or threshold that is more restrictive than a standard, requirement, or threshold contained in the Wisconsin Statutes.*

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Signature *Brigit G...*

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Date *6/5/2020*



WISCONSIN DNR RECREATIONAL PROPERTIES

# Regulatory and Warning Signs: Traffic Control Devices

MUTCD (Manual of Traffic Control Devices) Guidance

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## Introduction

**This guidance document** is intended to provide information to DNR property managers on the use, placement, installation, and maintenance of regulatory, warning and guide signs on low-volume, low-speed roads within DNR recreational properties. A sign that is confusing, or placed so that it cannot be seen in time for a vehicle operator to act on its message, will be ineffective and useless.

A key aspect of an effective sign system for a DNR recreational property is striking the correct balance between clear and concise messaging for public safety, and minimizing the impact of signs on the visual experience of our natural areas. Over use of signs will have a negative impact on scenic quality, appearing as visual clutter. Over use of signs also diminishes the effectiveness of sign messaging and can potentially lead to conflicting messages that will confuse visitors and reduce safety.

Under Wisconsin law, department roads open to the public for vehicular travel are considered “highways” (s.340.01(22), Stats.). As such, traffic control devices (such as signs) on DNR roads open for public use, must comply with state and federal standards. The Manual of Uniform Traffic Control Devices (MUTCD) is incorporated by reference in 23 Code of Federal Regulations (CFR), Part 655, Subpart F and shall be recognized as the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel. Information within this document is cross-referenced with the Wisconsin Manual on Uniform Traffic Control Devices (WMUTCD), a state supplement to the MUTCD by the Wisconsin Department of Transportation. The USDA Forest Service “Sign Installation Guide” and “Sign and Poster Guidelines for the Forest Service” are also referenced.

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# Definitions

**Average daily traffic:** The total number of vehicles passing a given point during a given time period divided by the number of days in that time period.

**Breakaway:** A design feature which allows a device, such as a sign post or support, to separate or bend at the base upon impact. Also known as “Crashworthy”.

**Clear Zone:** The total roadside border area, starting at the edge of the traveled way that is available for an errant driver to stop or regain control of a vehicle. This area might consist of a shoulder, a recoverable slope, and/or a nonrecoverable, traversable slope with a clear run-out at its toe.

**Closure:** When referring to access and travel management restrictions, the term “closure” means the route or area is closed to ALL types of traffic, including foot traffic. The term “closed” should not refer to routes that have been decommissioned or converted, or on routes where only some uses have been restricted.

**Conventional road:** A street or highway with over 400 seasonal average daily traffic (SADT) and speeds of 35 miles per hour or more.

**Design speed:** A selected speed used to determine the various design features (vertical curves, horizontal curves, stopping distance, sight distance, etc.) of a roadway.

**Low-volume road:** These roads typically have a traffic volume of less than 400 annual average daily traffic (AADT) and are considered variations on conventional roads or a special purpose road. Low-volume roads may be paved or unpaved.

**Managed use:** A mode of travel that is actively managed and appropriate on a trail or special purpose road, based on its design and management.

**Off-highway vehicle:** Any motor vehicle designed for or capable of cross country travel or immediately over land, water, sand, snow, ice, marsh, swampland or other natural terrain.

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## Definitions, cont.

**Onsite signing:** Comprises all signs within a property, or a specific site, necessary to adequately guide or inform a visitor or user. It includes all regulatory, warning and guide signs needed for road users, as well as identification of buildings, facilities or use areas, campsite markers, bulletin boards and posters.

**Posted speed:** The speed limit set by law, ordinance or order and shown on Speed Limit signs.

**Reasonable and prudent:** One who drives with care and due caution at a speed and in a manner which is safe. The care a driver must use considering factors such as traffic, weather and road or trail conditions.

**Recreation opportunity spectrum (ROS):** A framework for understanding the relationships of signing and other management actions in various settings to the visitors' experiences.

**Restriction:** A restriction precludes the use of the route or area during a specified time period by 1) type of vehicle or mode of travel (i.e. - passenger vehicles, log trucks, all-terrain vehicles, etc.) and 2) type of traffic (i.e. - nonmotorized, public, staff-only, etc.).

**Retroreflectivity:** Pertains to nighttime visibility of signs and pavement markings, describing the ability of a surface to return light back to its original source. Retroreflective signs and markings bounce light from vehicle headlights back toward the vehicle and the driver's eyes, making signs appear brighter and easier to see and read at night.

**Traveled way:** The portion of the roadway used for the movement of vehicles, exclusive of shoulders and auxiliary lanes or paths.

**Viewing distance:** The distance an object is viewed. Maximum viewing distance is the farthest a viewer can be located from an object and recognize the displayed content. For viewing text, the industry standard is general visibility at 50 feet per 1 inch of character height.

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# General Information

**Traffic control devices** (TCDs) are all signs, signals, markings, and other devices placed on, over or adjacent to a street, road, or highway by an entity with jurisdiction to regulate, warn, or guide traffic. The purpose of TCDs is to improve safety by directing the orderly and predictable movement of all traffic obeying the TCDs.

Proper location, position, and installation of TCDs is critical to maintaining safe circulation of motorized vehicles, non-motorized vehicles, and pedestrians within Wisconsin DNR recreational properties. A sign, or grouping of signs, that is confusing or cannot be seen in time for critical decisions, is useless. The effectiveness of a sign can be compromised if it is not correctly installed or properly maintained. The primary purpose of regulatory, warning and directional signage is to provide clear and easy to follow guidance for motorized vehicles, non-motorized vehicles and pedestrians, avoiding confusion and promoting safety. This is especially important for visitors unfamiliar with an area by providing guidance so that a reasonably attentive and prudent driver can safely travel the roads without putting themselves and others at risk.

MUTCD compliant regulatory, warning and guide signs are used within a property to govern the operation of motor vehicles, non-motorized vehicles, and pedestrians on park roads and drives. The information in this guidance document summarizes the standards and guidelines of the MUTCD that pertain to the internal low-volume and low-speed roads typical of our Wisconsin DNR recreational properties. This should be used as a quick visual reference for DNR staff to assist in placing, installing, and maintaining the signs and markers most frequently used within recreational properties. It does not include every type of sign or situation that might occur, since no two roads or situations are identical. If special conditions outside of those covered by this guidance document occur, please consult an Engineer for the proper signage design and installation method(s) required.

Uniform positioning of signs is highly desirable to give our visitors clear guidance and minimize potential conflicts, enhancing their experience and opportunity to enjoy our public lands, the main objectives of this guidance. This guidance is neither a substitute for engineering knowledge or judgement, nor is it intended to be a legal document requiring the installation of any specific TCD.

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# Sign System Principles

**Regulatory, warning and guide signs** shall be designed, located, installed and maintained to:

- Fulfill a legal requirement or an important need,
- Command attention,
- Convey a clear, simple meaning,
- Give adequate time for proper response.

Signs should be used conservatively. When signs are used in excess they tend to lose their effectiveness.

Signs that need to be seen both day and night shall be retroreflective or illuminated.

Signs shall be installed on the right-hand side of a travelway where they are easily recognized and understood by visitors. In some instances engineering judgement or study may determine that topography or other constraints dictate that a sign be placed on the left-hand side.

Signs should generally be individually installed on separate posts or supports.

Signs requiring separate decisions by the road or trail user shall be spaced sufficiently apart for the appropriate decisions to be made.

Signage should match visitor and travel information found within property brochures, maps and other sources of visitor information.

The cost and need to maintain an effective property sign system including planning, fabricating, installing, maintaining and replacing signs is an ongoing commitment and must be factored into the short-term and long-term budget cycles.



# Sign Plans

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**A property sign plan** provides the framework for managing an effective and consistent sign program, enhances the property identity, helps determine future budget needs and aids in resolving problems involving signs. It helps identify signs that are needed so unnecessary, redundant or conflicting ones are not installed or can be removed if installed prior to the sign plan being adopted. The sign plan, along with a sign inventory, documents all decisions and actions regarding signs, providing an up-to-date record of current signs and changes made over the years.

Site-specific sign plans may need to be developed to provide a finer grain of detail in complex development areas, such as a campground. Special use sign plans may be necessary for specific situations, such as temporary rerouting of traffic for a construction project or an property-wide interpretation plan.

Sign plans are revised and updated on an ongoing basis as signs are replaced, new signs added, signs that are no longer needed are removed or as physical or administrative changes take place, such as:

- Increase or decrease in traffic volume,
- Change in motor vehicle designation,
- Implementation or change in a speed limit,
- Change in surface type, such as pavement to gravel,
- Lowering or raising the maintenance standard in a road,
- Changes in a recreation area, such as changing the traffic flow or adding or reducing facilities,
- Road reconstruction, such as changing traffic flows or adding ingress or egress points,
- Changes in road use, such as commercial hauling for a timber sale,
- Revised road management or transportation management objectives.

Sign plans should contain relevant physical, technical and management information used to assist in decisions:

- New sign installations, sign replacements and sign removals,
- Maintenance activities,
- Budget preparation,
- Annual work plans.

# Sign Inventory

**A sign inventory** should be all inclusive, listing installed and stored signs, with a description of existing and planned signs, posters and other traffic control devices; their supports, locations and conditions; any relevant vandalism history; maintenance and inspection dates and results; and any documented engineering studies or recommendations. Sign descriptions should include sufficient detail to facilitate reordering if a sign is damaged or missing. Bulletin board or kiosk assemblies, groups of delineators or markers and other similar groupings can be inventoried as units. Inventory entries should be keyed to the sign plan for ease of locating sign units.

The following detailed information should be documented in the inventory:

- ID number: a unique identification number assigned to each sign unit, keyed to the sign plan,
- Catalog number: the MUTCD sign identifier for standard signs, BSI sign code for custom signs,
- Panel size and material: the overall dimensions of the sign and thickness of the sign panel; the type of panel substrate, such as aluminum, cedar planks, high density urethane, high pressure laminate, etc. ,
- Sign legend: the sign message exactly as it appears on the sign, line by line, with letter heights
- Legend fabrication: the sign message is fabricated as routed, silk screened, pressure-sensitive sheeting, etc.,
- Surface type: method of message fabrication, such as routed, silk screened, printed; and type of sign surface attached to the panel, such as retroreflective sheeting with grade, painted, stained, baked enamel, natural, etc.,
- Date of sign installation, repair or replacement,
- Permit requirements, if necessary,
- Special site or environmental conditions: impaired sight lines, surface bedrock, high water table, etc..

Additional information that could be included within the inventory for more complete documentation:

- Post or base type and dimensions; note whether the post is breakaway,
- Viewing distance: the approach distance at which the sign is intended to be read or viewed,
- Clear zone requirements: distance from travelway edge to the near sign edge, height from road grade to bottom of sign,
- Photographic record: photo record of complete sign unit with date of image.

# Sign Color Standards

## Color Standards: FHWA (Federal Highway Administration)



### Red

Background for Danger signs (Stop, No Entry, Wrong Way, etc.);  
Circle and slash on Prohibition and No Parking signs



### White

Legend (text and/or symbols) for Danger, Guidance, and Directional signs;  
Background for most Regulatory signs



### Yellow

Background for Warning and Road Hazard signs



### Orange

Background for Construction and Maintenance Warning signs;  
Temporary Traffic Control



### Black

Legend (text and/or symbols) for Warning and Regulatory signs



### Blue

Background for Road User Services Information, Tourist Information,  
Evacuation Routes, and Barrier-free Access signs



### Brown

Background for Recreational and Cultural Interest, and Area Guidance



### Green

Background for Guidance and Directional signs;  
Circle around "P" on Parking signs



### Fluorescent Yellow-Green

Background for Pedestrian Warning, Bicycle Warning, Playground  
Warning, School and School Bus Warning signs



### Fluorescent Pink

Background for Incident Management

## Color Standards: Wisconsin DNR Recreational Property












### WSPS Brown

Background for Guidance and Directional Signs within a DNR Recreational Property

(PMS 4975C)

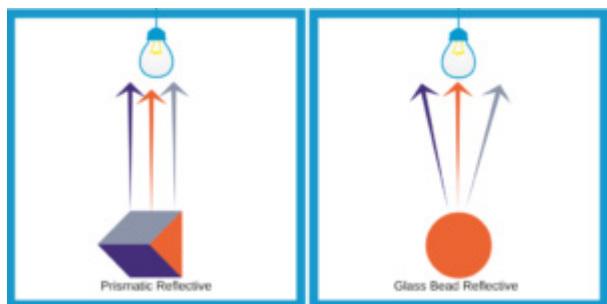
# Sign Shape Standards

	<b>Octagon</b>	Stop Signs exclusively
	<b>Equilateral Triangle</b> (1 Point Down)	Yield Signs exclusively
	<b>Circle</b>	Roadway-Rail Grade Crossing (Advance Warning)
	<b>Pennant Shape/ Isosceles Triangle</b>	No Passing exclusively
	<b>Pentagon</b> (Pointed Up)	County Route Sign (tapered bottom corners); School Advanced Warning (squared bottom corners)
	<b>Crossbuck</b> (2 Rectangles in an "X")	Roadway-Rail Grade Crossing only
	<b>Diamond</b>	Warning Series Signs
	<b>Rectangle</b> (Including Square)	Regulatory Series, Guide Series, Warning Series Signs, Recreation Symbols
	<b>Trapezoid</b>	Recreational and Cultural Interest Area Series Signs; National Forest Route Signs

# Retroreflectivity vs. reflectivity

**Retroreflectivity refers** to the property of a traffic sign or pavement marker to reflect light back to the driver of a vehicle which generated light through its headlights. The reflective surfaces of traffic signs and pavement markers increase visibility at night, but disperse the light, so drivers aren't blinded. Maintaining traffic sign retroreflectivity is important since nighttime fatal crashes occur approximately three times as often as daytime fatal crashes.

**There are two basic types of retroreflective surfaces: glass bead surfaces and prismatic sheeting:**



- **Glass bead reflective surfaces** use glass spheres to collect light and bounce it back to the source. The rounded shape of beads creates the retroreflectivity. Glass beads incorporated in pavement marking paints are an example.
- **Prismatic reflective surfaces** do basically the same thing by using sharp angles like prisms to collect light and direct it back. Prisms work more efficiently than glass beads by directing more light back instead of dispersing the light, creating a brighter return of light. Prismatic sheeting used for road signs is an example, and it is available in a range of grades with different reflective qualities.

**Sign types requiring a minimum maintained retroreflectivity level:**

- Black legend on white, yellow or orange background (danger or prohibition signs, warning/road hazard signs, construction or maintenance warning signs, temporary traffic control)
- White legend on red background (danger or prohibition signs)

**Sign types that don't require retroreflectivity:**

- Parking, Standing and Stopping signs (R7 and R8 series)
- Walking and Crossing signs (R9 series, R10-1 through R10-4b signs)
- All signs with blue or brown backgrounds
- Bikeway or trail signs that are intended for exclusive use by bicyclists or trail users

# Minimum Visibility Distance

## Sign Placement Distance Guidance for Installing a Warning Sign

Signs are to be placed where they provide adequate time for response considering such things as approach speed, sight distance and visibility, road conditions, etc. Consideration of seasonal changes is critical and sign placement should be based on protecting against worst case scenarios, such as possible obstructed views when vegetation is fully leafed out, or longer stopping distances with slick or icy winter roads.

**Regulatory Signs** Place at or before the point the prohibition begins.

**Warning Signs** Place in advance of the condition using the following tables

Posted or 85th Percentile Speed	Minimum Visibility Distance
20 mph	No Suggested Minimum
25 mph	150 ft.
30 mph	200 ft.
35 mph	250 ft.
40 mph	325 ft.
45 mph	400 ft.
50 mph	475 ft.
55 mph	550 ft.

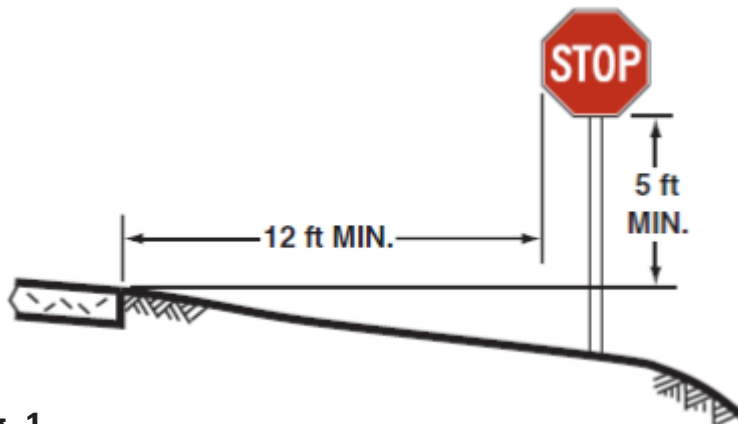
# Placement Guidelines

## Roadside Post Mounted Regulatory, Warning and Guide Signs

Signs should be located so that they:

- Are outside the clear zone, unless placed on a breakaway or yielding support,
- Optimize nighttime visibility,
- Minimize the effects of mud splatter and debris,
- Do not obscure each other or are hidden from view by vegetation or structures,
- Do not obscure the sight distance to approaching vehicles on a cross street or trail.

### Sign Mounting Height and Lateral Offset from the Road Edge: Low-volume Park Road, No Shoulder



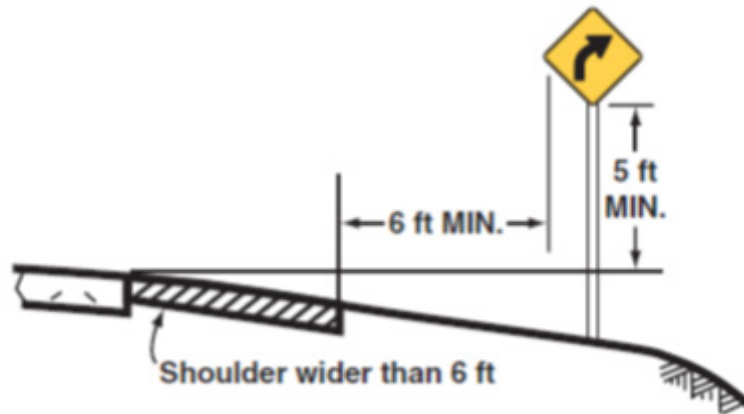
Minimum height of the sign, measured vertically from the bottom of the sign to the elevation of the near edge of pavement, of shall be 5-feet.

The minimum lateral offset of the sign should be 12-feet from the edge of the traveled way to the near edge of the sign.

Fig. 1

## Placement Guidelines, cont.

### Sign Mounting Height and Lateral Offset from the Road Edge: Low-volume Park Road with Shoulder

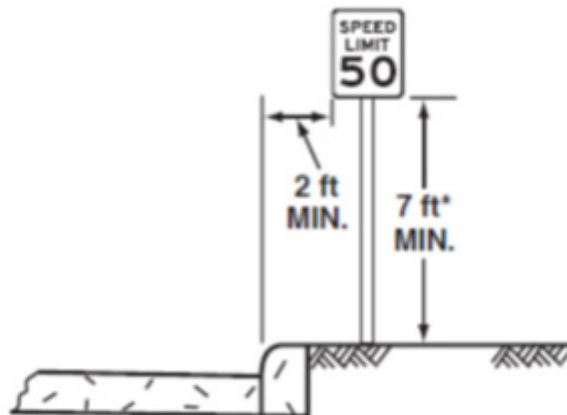


Minimum Height, measured vertically from the bottom of the sign to the elevation of the near edge of pavement, of shall be 5-feet.

If a shoulder wider than 6-feet is present, the minimum lateral offset should be 6-feet from the edge of the shoulder to the near edge of the sign.

Fig. 2

### Sign Mounting Height and Lateral Offset from the Road Edge: Commercial Area or \* where Parking, Bicyclists or Pedestrians are likely to be present



Minimum Height, measured vertically from the bottom of the sign to the elevation of the near edge of pavement, top of curb or top of sidewalk shall be 7-feet.

On conventional roads where it is impractical to provide the lateral offset described in Fig. 2, a lateral a minimum lateral offset of 2-feet from the edge of the traveled way, curb face or sidewalk may be used.

Fig. 3



# Typical Sign Plates

## MUTCD Sign Identifier

MUTCD assigns a unique series of letters and numbers for each standard sign plaque. These sign identifier codes are used to easily order standard MUTCD signs. The most common letter abbreviations are “R” for regulatory signs and “W” for warning signs. These letters are combined with numbers and occasionally other letters to generate a unique code for each sign face:

- **R1-1** is the MUTCD identification code for a standard octagon STOP SIGN. This code can be expanded to include the sign size - **R1-1-30** is a 30-inch diameter standard octagon STOP SIGN.



R1-1

**STOP Sign (R1-1)** shall be an octagon with a white legend and border on a red background. No secondary legend information is allowed.

**Size: 30" x 30"** (typ.) mounted on a single post.



R1-2

**YIELD Sign (R1-2)** shall be a downward-pointing equilateral triangle with a wide red border and legend YIELD in red on a white background.

**Size: 30" x 30" x 30"** (typ.) mounted on a single post.

Use a STOP sign only when traffic is ALWAYS required to stop. Consider using YIELD signs in lieu of STOP signs when appropriate. YIELD signs do not require drivers to come to a full stop. They still clearly establish right-of-way and do not require the level of enforcement needed for STOP signs.

When used, YIELD signs normally should be placed to control the traffic on the road with the lowest volume. They should not be placed on the approach to more than one of the intersecting roads at a “Y” or “T” intersection, nor placed on more than two approaches at an “X” intersection. They should not be used at any intersection where there are STOP signs.



WISCONSIN DNR RECREATIONAL PROPERTIES

# Regulatory and Warning Signs: Traffic Control Devices

MUTCD (Manual of Traffic Control Devices) Guidance