

## Temporary Traffic Control Devices

### Crashworthy Testing Compliance

With the exception of Trailer Mounted Devices described below, TTC devices, including channelizing devices, Type III barricades, ballast systems, and sign support structures used on any roadway open to public travel, shall be crashworthy when installed facing traffic. Use devices on the Wisconsin Approved Products list.

FHWA policy requires that all roadside appurtenances, including TTC devices, have been successfully crash tested in accordance with the National Cooperative Highway Research Program (NCHRP) Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features" or the American Association of State Highway and Transportation Officials (AASHTO) "Manual for Assessing Safety Hardware (MASH)."

All new devices purchased for use on the state highway system must meet MASH 2016 standards. Devices that do not meet this requirement will have sunset dates set by the Department and published on the approved products list for when the devices can no longer be used.

### Trailer Mounted Devices

When required, trailer mounted devices, such as Arrow Boards and Portable Changeable Message Signs shall be installed per Layout 5. When not in use, the devices should not be stored on the shoulder.

### High-Visibility Clothing

All workers who are exposed to traffic, work vehicles, or construction equipment within the TTC zone shall wear high-visibility safety apparel meeting ANSI/ISEA 107-2015 type R class 2.

Clothing shall have an attached original label indicating the Performance Class. When working in an area that does not require the use of a hard hat for head protection, a high-visibility hat may be worn.

### Vehicle Warning Lights

All vehicles shall have approved operating vehicle warning lights when decelerating to enter a TTC zone and again when a vehicle leaves the TTC zone and enters the traveled traffic lane. All vehicles within a mobile TTC operation shall have approved vehicle warning lights. Vehicle warning lights shall be visible for 360 degrees around the vehicle.

### Optional Devices

Some signs and devices on the TTC layouts are shown as optional or have factors that may make them optional. Some advance warning signs and/or channelizing devices may be omitted for low-speed roads and/or if the duration will be less than 1 hour. Read the associated notes on each layout for options.

## Channelizing Devices

The function of channelizing devices is to delineate a desired vehicle path, mark specific hazards on or near the roadway, separate opposing traffic flows, and partially or totally close the roadway. See Figure 5, Longitudinal Drop-off Guidelines for the use of channelizing devices adjacent to shoulder edge drop-offs or uneven lanes.

Channelizing devices include cones, drums, barricades, temporary raised islands, and various kinds of markers. Follow Standard Specifications for Highway and Structure Constructions for more detailed information on device sheeting standards. Visibility is determined based upon the total retroreflective area of the device.

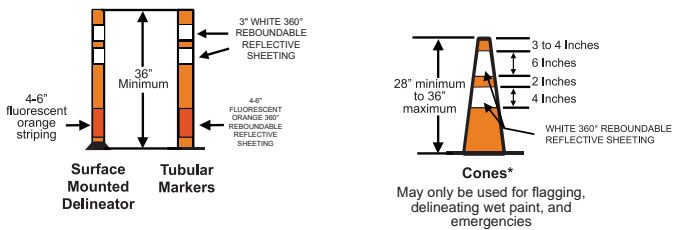
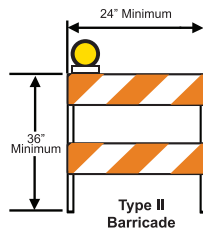
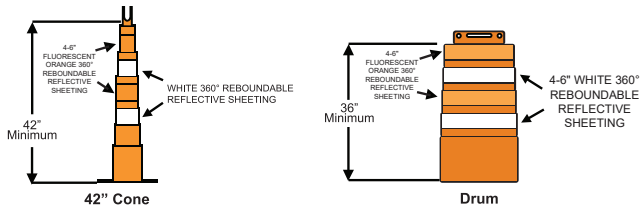
For lane and shoulder closures on all highways, only use drums in the tapers. Drums are also the preferred channelizing device along the tangent section of the lane closure. 42-inch cones may be used in the tangent section but the spacing must be reduced by half.

Flaggers that move every 15 minutes may use cones less than 42-inches tall to help direct traffic to the proper side of the road.

Flashing warning Type "A" lights are required on barricades if remaining overnight.

Steady burn Type "C" lights required on drums in tapers if remaining overnight.

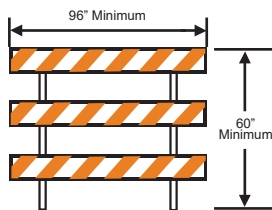
### Channelizing Devices



May only be used for flagging, delineating wet paint, and emergencies

### TYPE 3 BARRICADES

- Orange diagonals shall slope down toward the traffic side.
- Signs mounted on Type III barricades should not cover more than half of the top two rails or 33 percent of the total area of the three rails.
- Type A Flashing Warning Lights may be used - place on both side of barricade. Required for nighttime work or if device remaining overnight.



Type III Barricade

## Work Zone Signing

As a general rule, signs should be located on the right-hand side of a two-way roadway and on both the right and left sides of a multi-lane divided roadway. When special emphasis is needed, signs may be placed on both the left and right sides of a two-way roadway. Signs, although ordinarily mounted on posts for long-term operations, may be mounted on or above barricades or on temporary supports.

Signs mounted on temporary supports should not be placed in the open traveled lane where they pose a hazard to traffic nor where pedestrians are expected to travel. Generally, these signs are placed on the shoulder or in the parking lane of the street or highway. The signs should not be blocked from view by parked vehicles, trees, or other sight obstructions on or near the roadway. Any portable sign or barricade placed in a pedestrian walkway that could be a hazard to a visually impaired pedestrian should have a detectable edge to guide the pedestrian around the hazard. Signs mounted on portable supports should not be used for a duration of more than 7 days.

Signs shall not be mounted on existing traffic signs, posts, or other utility structures without permission from the proper authority. All signs shall be mounted so that the sign face is approximately perpendicular to the roadway and vertically plumb in accordance with Quality Standards. The bottom of signs mounted on barricades or temporary supports shall be no less than 1 foot above the traveled way. Supplemental advisory plaques shall be placed directly below or on the lower side of the warning sign nearest traffic.

Some activity areas move slowly down a roadway and away from the operation's advance signing. The distance from the last advance warning sign to the activity area should not allow the motorist to forget the existence of the TTC zone. For high-speed streets and rural highways, the maximum distance from the last sign to a point where the driver detects the activity area shall not exceed 3500'. In urban areas, the number of intersections shall be considered and this distance reduced accordingly.

When available width is less than 16 feet, a Max Width (W12-52) sign should be used. The width shown should be 1 foot less than available width.

All warning signs shall be at least 48 x 48 inches in size.































Reference the WisDOT Sign Code Manual for sign sizes based on facility type.

Advance warning signs should be installed for drivers entering the TTC zone from cross streets. ROAD WORK AHEAD signs on intersecting roadways shall be installed if the motorist will not encounter another advance warning sign prior to reaching the activity area except for mobile operations.

All signs shall be retroreflective with a material that has a smooth sealed outer surface that shows the same shape and color both day and night. Non-retroreflective mesh signs shall not be used at any time.




























Roll-up signs may be used for daytime and for nighttime only when workers are present to monitor the signs.

Follow Standard Specifications for Highway and Structure Construction for more detailed information on signing details.

 R1-1	 R9-9	 W04-2 (R or L) Lane Ends
 R1-2	 R9-10	
 R2-1	 R9-11 (R or L)	 W05-1
	 R10-6	
 R2-6P	 R11-2	 W057-51
 R3-1 No Right Turn	 R11-4	 W08-1
	 W01-4 (R or L) Reverse Curve	
 R3-2 No Left Turn	 W01-6 One Direction Large Arrow (R or L)	 W08-2
 R3-7L	 W03-1 Stop Ahead	 W08-8
 R3-18 U-Turn & Left Turn Prohibition	 W03-2 Yield Ahead	
	 R4-7 Keep Right	 W03-3 Signal Ahead
 R4-11 Bikes may use full lane	 W03-4	
	 R3-20 (R or L)	 W03-5 Speed Reduction

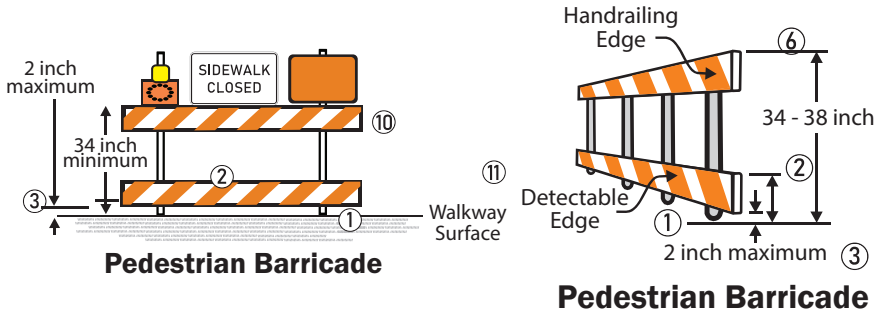
For additional signs and information on typical sizes and usage, see the WisDOT Sign Plate Manual

**Sign Codes Quick Reference: Figure 1**

 <b>W08-4</b>	 <b>W12-52</b> Max Width	 <b>W024-1</b> Double Reverse Curve (R or L)
 <b>W012-1D</b> Double Arrow	 <b>W20-58A</b>	 <b>G20-4</b>
 <b>W013-1</b>	 <b>W20-53A</b>	 <b>W21-62Q</b>
 <b>W016-7</b> (R or L)	 <b>W21-65</b>	 <b>G20-51</b>
 <b>UTILITY</b> <b>W21-7</b> <b>1000 FT</b> <b>W20-1</b> <b>1 MILE</b>	 <b>W04-1</b> (R or L)	 <b>G20-57</b>
 <b>W20-3A</b>	 <b>W04-5</b>	 <b>G20-2A</b>
 <b>W20-4A</b>	 <b>W21-5</b>	 <b>W08-76</b> WHEN FLASHING
 <b>W20-7A</b> Flagger Ahead	 <b>W21-66</b>	 <b>G20-1</b>
 <b>LEFT</b> <b>W20-5</b> <b>CENTER</b> <b>1000 FT</b> <b>1/2 MILE</b> <b>BIKE</b>	 <b>W21-64</b>	 <b>D9-6</b> Handicapped Accessible

For additional signs and information on typical sizes and usage, see the WisDOT Sign Plate Manual

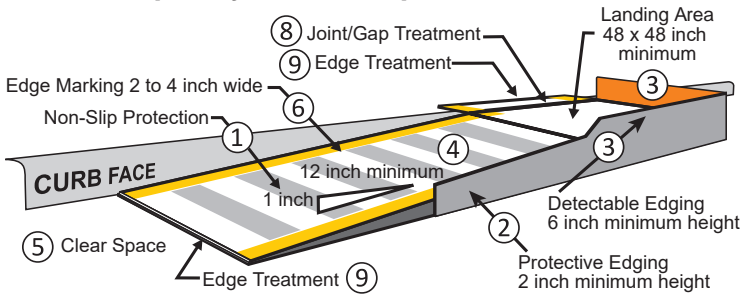
Sign Codes Quick Reference: Figure 1

**NOTES:**

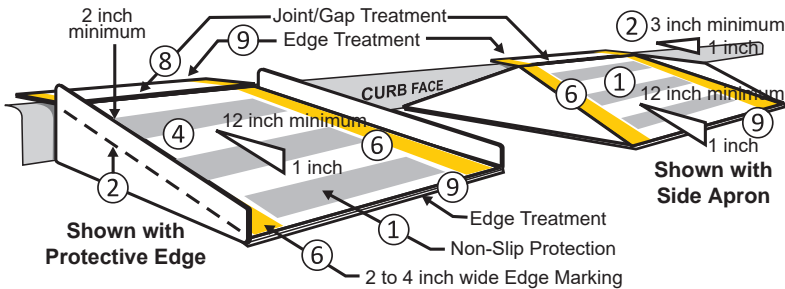
1. To prevent any tripping hazard to pedestrians, ballast shall be located behind or internal to the device. Any support on the front of the device shall not extend into the 48-inch minimum walkway clear space and shall have 2-inch maximum height above the walkway surface with approved beveling.
2. Detectable edges for long canes shall be continuous and 6 inches minimum above the walkway surface and have color or markings contrasting with the walkway surface. The detectable edge around a portable sign stand should be placed in the walkway area in which the sign poses a hazard to a visually impaired pedestrian.
3. Devices shall not block water drainage from the walkway. A gap height or opening from the walkway surface up to 2-inch maximum height is allowed for drainage purposes.
4. Railings or other objects may protrude a maximum of 4 inches into the walkway clear space when located 27 inches minimum above the walkway surface.
5. Longitudinal channelizing devices for pedestrians shall be 32 inches high or greater.
6. When hand guidance is required, the top rail or top surface shall be:
  - In vertical plane perpendicular to the walkway above the detectable edge,
  - Continuous at a height of 34 to 38 inches above the walkway surface, and
  - Supported with minimal interference to the pedestrian's hands or fingers.
7. All devices shall be free of sharp or rough edges and fasteners (bolts) shall be rounded to prevent harm to a person or clothing.
8. All devices used to channelize pedestrian flow should interlock such that gaps do not allow pedestrians to stray from the channelized path.
9. Any pedestrian devices used to provide positive protection (traffic or hazard) for pedestrians or workers shall meet crashworthy requirements appropriate for the barriers' application.
10. Barricades shall be used to close the entire width of the walkway surface.
11. A walkway surface shall be firm, stable, and slip-resistant.

**Typical Pedestrian Devices: Figure 2**

### Temporary Curb Ramp - Parallel to Curb



### Temporary Curb Ramp - Perpendicular to Curb



**NOTES:**

1. Curb ramps shall be 48 inches minimum width with a firm, stable, and non-slip surface.
2. Protective edging with a 2-inch minimum height shall be installed when the curb ramp or landing platform has a vertical drop of 6 inches or greater or has a side apron slope steeper than 1:3 (33%). Protective edging should be considered when curb ramps or landing platforms have a vertical drop of 3 inches or more.
3. Detectable edging with 6 inches minimum height and contrasting color shall be installed on all curb ramp landings where the walkway changes direction (turns).
4. Curb ramps and landings should have a 1:50 (2%) max cross-slope.
5. Clear space of 48 x 48 inches minimum shall be provided above and below the curb ramp.
6. The curb ramp walkway edge shall be marked with a contrasting color 2-to 4-inch-wide marking. The marking is optional where color contrasting edging is used.
7. Water flow in the gutter system shall have minimal restriction.
8. Lateral joints or gaps between surfaces shall be less than 0.5 inches in width.
9. Changes between surface heights should not exceed 0.5 inches. Lateral edges should be vertical up to 0.25 inches high, and beveled at 1:2 between 0.25 inches and 0.5 inches in height.
10. Whenever pedestrians are going to intersect with vehicle traffic, a detectable warning field is required.

**Temporary Curb Ramp: Figure 3**



## Portable Changeable Message Signs (PCMS)

The primary purpose of PCMS is to advise the driver of unexpected traffic and routing situations. State-owned PCMS are capable of being set up manually or controlled remotely by the Traffic Management Center (TMC). Manual setup allows a designated user to program the sign using the on-board computer keyboard. Remote control of PCMS is performed by operators located in the control room at the TMC. State-owned PCMS that have a cellular connection and are in good working condition can be programmed and scheduled to display messages remotely.

### PCMS COORDINATION WITH THE TRAFFIC MANAGEMENT CENTER (TMC)

Please contact [stoc@dot.wi.gov](mailto:stoc@dot.wi.gov) or 414-227-2142.

### General Guidelines

- A PCMS should be used to supplement conventional signs, pavement markings, and lighting.
- If a PCMS is used as an arrow board, it shall meet all of the requirements of an arrow panel, and shall be used solely as an arrow board.
- A PCMS installed on the shoulder of a road shall be accompanied with channelizing devices (see Layout 5).

### Messages

- Each display should contain a single thought. The message should consist of no more than two phases.
- The entire message should be readable twice at the posted speed limit. Blank or filler frames shall not be used.
- An accurate description of the work location or the incident location is critical.
- The PCMS shall have readable up-to-date information. Any delay message should accurately reflect the traffic delay time.
- The PCMS message shall use days of the week, not calendar dates, unless the PCMS is placed 7 days in advance.
- The use of abbreviations is discouraged. The entire word should be spelled out whenever space permits.
- If multiple PCMS are used, make sure the messages do not conflict.
- **DANGER, HAZARDOUS, OR CAUTION** shall not be used.
- Frames should be read in either direction.

For more information on the use of PCMS, see the TEOpS 6-2-55

**Table 2: Abbreviations Allowable on PCMS(s)**

<b>Emergency Word Message</b>	<b>Standard Abbreviation</b>	<b>Emergency Word Message</b>	<b>Standard Abbreviation</b>
Access	ACCS	Expressway	EXPRS, EXPWY**
Afternoon/Evening	PM	Feet	FT
Ahead	AHD	Freeway	FRWY, FWY**
Alternate	ALT	Friday	FRI
Avenue	AVE, AV	Frontage	FRNTG
Bicycle	BIKE	Hazardous	HAZ
Blocked	BLKD	Hazardous Material	HAZMAT
Boulevard	BLVD*	High Occupancy Vehicle	HOV
Bridge	BR	Highway	HWY
Cannot	CANT	Highway-Rail Grade Crossing	RR XING
Center	CNTR	Hospital	HOSP
Center (as part of a place name)	CTR	Hour(s)	HR, HRS
Chemical	CHEM	Information	INFO
Circle	CIR**	International	INTL
Closed	CLSD, CLOSD	Interstate Numbered Route	I
Condition	COND	Junction/Intersection	JCT
Congested	CONG	Lane	LN, LA
Construction	CONST	Left	LFT, LF, L
County Road Numbered Route	CR	Local	LOC
Court	CT**	Lower	LWR
Crossing (other than highway-rail)	X-ING	Maintenance	MAINT
Do Not	DONT	Major	MAJ
Downtown	DWNTN	Maximum	MAX
Drive	DR**	Wisconsin Numbered Route	WIS
East	E	Minimum	MIN
Eastbound	E, E-BND, EB	Minor	MNR
Emergency	EMER	Minute(s)	MIN
Entrance, Enter	ENT	Monday	MON
Exit	EX	Morning/Late Night	AM
Express	EXP		

**Table 2: Abbreviations Allowable on PCMS(s), cont.**

<b>Emergency Word Message</b>	<b>Standard Abbreviation</b>
Mount	MT
Mountain	MTN
National	NATL
Normal	NORM
North	N
Northbound	N, N-BND, NB
Oversized	OVRSZ
Parking	PKING
Parkway	PKWY**
Pavement	PVMT
Pedestrian	PED
Place	PL**
Pounds	LBS
Prepare	PREP
Right	RT, R
ROAD	RD**
Roadwork	RDWK
Route	RT, RTE
Saint	ST
Saturday	SAT
Service	SERV
Shoulder	SHLDR
Signal	SIGNL
Slippery	SLIP
South	S
Southbound	S, S-BND, SB
Speed	SPD
Stadium	STDM
Street	ST**
Sunday	SUN

<b>Emergency Word Message</b>	<b>Standard Abbreviation</b>
Sweeper	SWEEP
Temporary	TEMP
Terrace	TER**
Thursday	THUR
Tons of Weight	T
Traffic	TRAF
Trail	TR**
Tuesday	TUE
Two-Way Inter-section	2-WAY
Two-Wheeled Vehicles	CYCLES
Upper	UPR
US Numbered Route	US
Vehicle(s)	VEH, VEHS
Warning	WARN
Wednesday	WED
West	W
Westbound	W, W-BND, WB
Will Not	WONT

**NOTES:**

\* A space and no dash shall be placed between the abbreviation and the number of the route.

\*\* This abbreviation shall not be used for any application other than the name of a roadway.

Operating Mode

Panel Display  
(Element layout for Type C Panel shown)

1. The following mode shall be provided:

(Right arrow is shown, left arrow is similar)

Flashing Arrow



Do not use sequential arrow or chevron mode

Move/Merge Right

2. The following mode shall be provided:

Flashing Double Arrow



Move/Merge Right or Left

3. One of the following two modes shall be provided:

Flashing Four Corners



Flashing Bar



Panel Type	Minimum Size (Inches)	Minimum Legibility Distance (Miles)	Minimum Number of Elements	Recommended Usage
A	48 x 24	0.50	12	Low Speed Streets
B	60 x 30	0.75	13	Anything not covered in A or C
C	96 x 48	1.00	15	Freeways and Expressways

Arrow Stick



Arrow Sticks may supplement other TTC devices, but shall not be used in place of arrow boards

**Advanced Warning Arrow Board Specification: Figure 4**