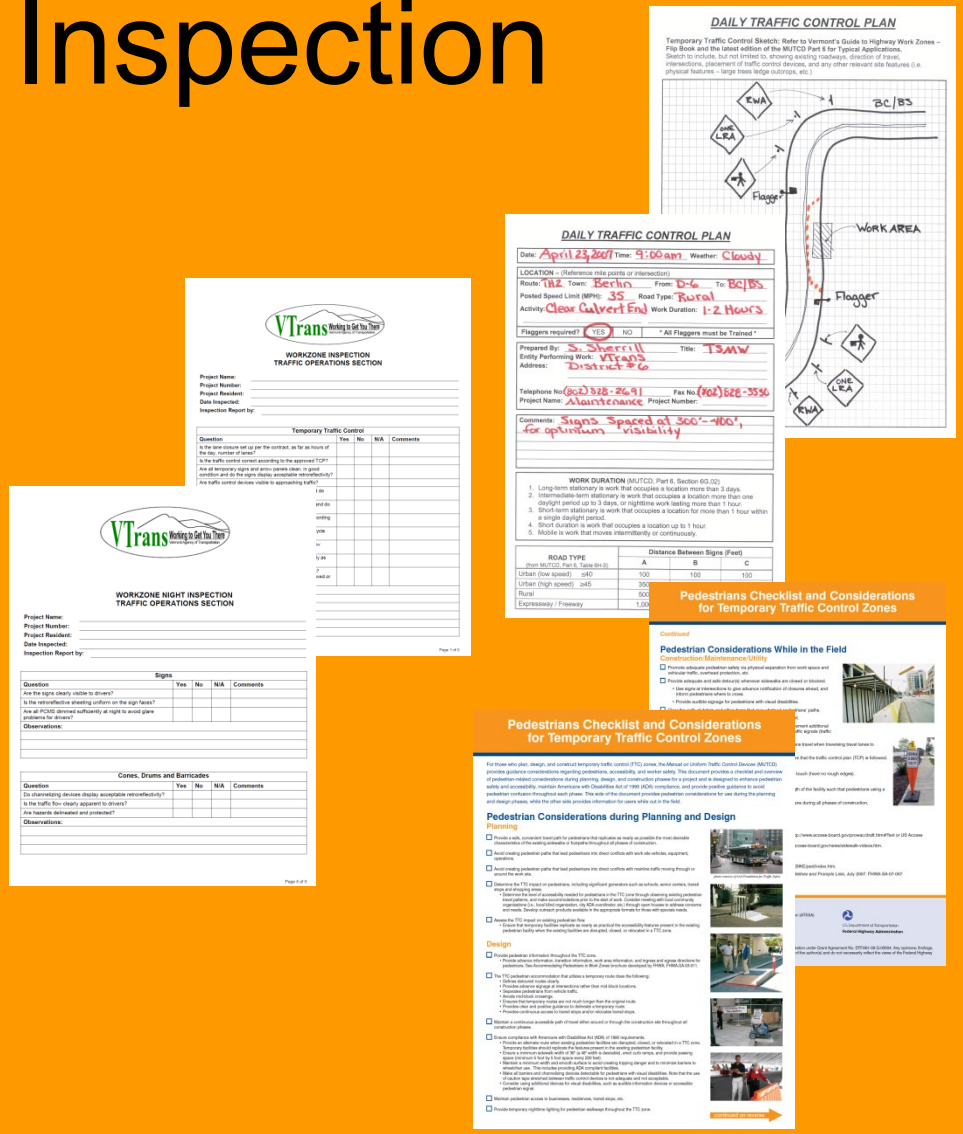
Work Zone Dos and Don’ts

Types of Inspection

- Daytime Work Zone Inspection
- Nighttime Work Zone Inspection
- Pedestrian Considerations
- Daily traffic Control Plan
- Drive Thru Inspection



Taper Lengths
&
Buffer Spaces

Types of Tapers & Buffer Spaces

Table 6C-3. Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	50 feet minimum, 100 feet maximum

Note: Use Table 6C-4 to calculate L

Table 6C-4. Formulas for Determining Taper Length

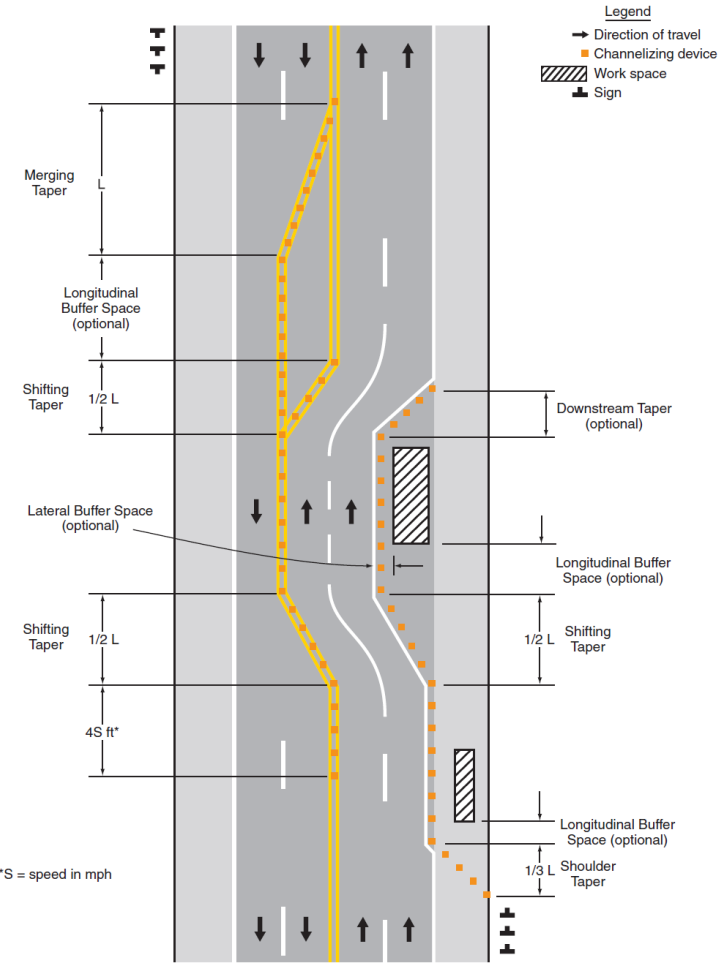
Speed (S)	Taper Length (L) in feet
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or more	$L = WS$

Where: L = taper length in feet
W = width of offset in feet
S = posted speed limit, or off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph

Longitudinal Buffer Space		Longitudinal Buffer Space	
Speed* (mph)	Length (feet)	Speed* (km/h)	Length (meters)
20	115	30	35
25	155	40	50
30	200	50	65
35	250	60	85
40	305	70	105
45	360	80	130
50	425	90	160
55	495	100	185
60	570	110	220
65	645	120	250
70	730		
75	820		

* Posted speed limit, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed

Figure 6C-2. Types of Tapers and Buffer Spaces



Merging Taper

Speed Limit	Minimum Taper Length (L) in Feet Lane Width (W) in Feet				Minimum Number of Devices Lane Width in Feet				Maximum Device Spacing in Feet		Speed Limit (S)
MPH	9	10	11	12	9	10	11	12	Along Taper	Along Tangent	MPH
25 or below	95	105	115	125	5	6	6	6	25	50	25 or below
30	135	150	165	180	6	6	7	7	30	60	30
35	185	205	225	245	7	7	8	8	35	70	35
40	240	270	295	320	7	8	9	9	40	80	40
45	405	450	495	540	10	11	12	13	45	90	45
50	450	500	550	600	10	11	12	13	50	100	50
55	495	550	605	660	10	11	12	13	55	110	55
60	540	600	660	720	10	11	12	13	60	120	60
65	585	650	715	780	10	11	12	13	65	130	65
70	630	700	770	840	10	11	12	13	70	140	70
75	675	750	825	900	10	11	12	13	75	150	75
80	720	800	880	960	10	11	12	13	80	160	80

Spacing of channelizing devices should not exceed a distance in feet equal to the speed when used for the taper in spacing of devices and a distance in feet of twice the speed when used for tangent in spacing of devices.

Note: This rule does not translate directly in the metric system. This method may be used if speed in kph is converted first to mph, and the rule in feet is then converted back to meters.

Signs

Improper sign spacing.

Post extends above top of sign.

Decimal distance and improper font for Road Work sign.

BUMP sign in poor condition.

BUMP sign is not fluorescent orange sheeting.


ROAD WORK
NEXT 16 MILES
Sheeting types
do not match.

Non-retroreflective sign sheeting.

Sheeting on the bottom is the proper fluorescent orange.

The Type III sheeting used in the middle is no longer acceptable.


BUMP
Poor condition, not fluorescent orange.

Ya really should pay attention to what you're doing.


Sign visibility
obscured by guardrail.

Sign visibility obscured by guardrail.

Place signs on shoulder or use stands that can raise bottom of sign above guardrail.


Construction sign obscures visibility of existing traffic control device.

Signs spaced too closely.

Proper sign spacing (generally 200 feet) should be maintained whenever possible.

Sign stacking should be avoided.

Select highest priority message in tight spaces.

Sign clutter.

Improperly covered sign.

Existing signs which contradict the temporary traffic control package must be completely covered with solid material (signs will reflect through burlap.)


Improperly covered sign.
Posts extend above top of sign.

Appropriate sign cover


Appropriate sign cover


Post extending above top of sign.
ROAD WORK 500 FT
MOTORCYCLES USE CAUTION
Illegal sign stand.

Improper ballast.

Non-reflective sign sheeting.

NCHRP-350 sign stand?

Regulatory signs should be black on white.

Warning signs should be diamond shaped black on orange.

Illegal sign stand.

Improper sign stand


All portable sign stands should have an NCHRP-350 label, which will specify what type of sign can be mounted on the stand.
NCHRP-350 COMPLIANT
For use with noted Eastern Metal/USA-SIGN® & other NCHRP-350 Accepted Sign Materials
Accepted Materials
- Reflexite® 15mm Endurance™ & Stabler Plastic
- Reg./Rigid Roll-up Signs
- .080 and .100 Aluminum
- 5/8 Plywood
- 2 mm AL/LDPE Laminate Dibond, Alpolic, Reynolite
- 10 mm Corrugated Plastic
Eastern Metal
USA-SIGN
X-550B
Interstate™ Stand

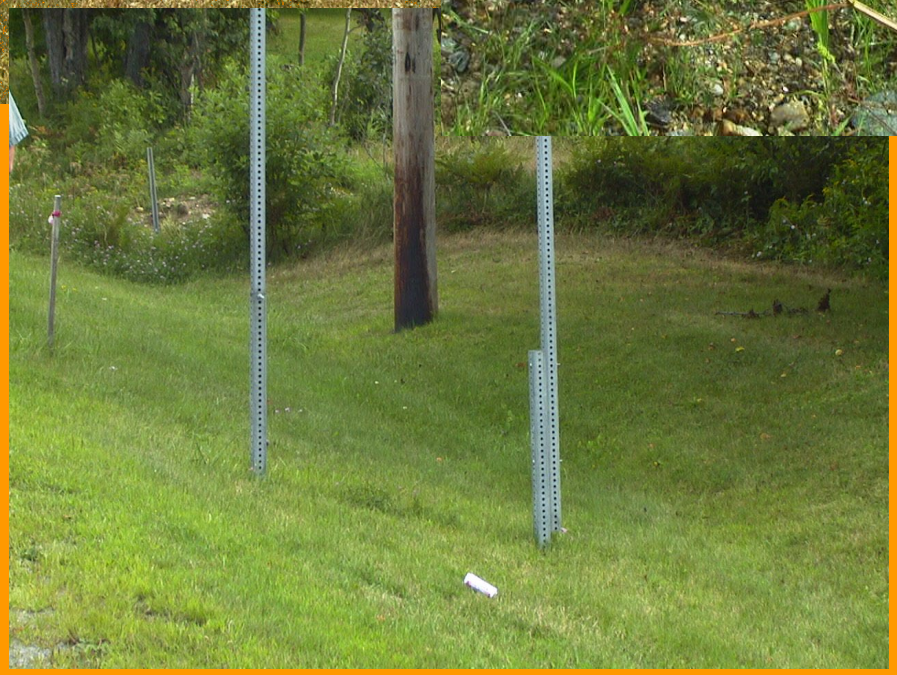
Sign with interchangeable text inserts.

Example of corrugated solid substrate sign.

Gate-posted signs required when multiple lanes in one direction.

Sign Posts

Sign illegally mounted on utility pole.



Stub Height exceeds 4 inches.


BUTT-WELD
SPLICE


Proper installation of nested flanged channel posts with stub height less than 4 inches.

Proper installation of square steel sign posts with stub height less than 4 inches.

Delineation


Bracing shall not be added to stands. This will invalidate tested crashworthiness.


ROAD
CLOSED
SANDBAG ON TOP
OF DRUM


Pavement markings painted black


Improper cones.
Cones shall be 28” tall (min) and have two retroreflective bands. The top one shall be 6 inches and the bottom one shall be 4 inches.


Cone in unacceptably poor condition.


Barrel in unacceptably poor condition.
17 11:44AM

Temporary Barriers


Improper joint
connection.


Shell
Improperly protected barrier end.


ROAD
CLOSED
ROAD
CLOSED
There isn't much right about this set-up.
It's a fatality and lawsuit waiting to happen.


Barrels are not crash attenuation devices.


Crash attenuation devices must be properly maintained. Cracked sand barrels can lead to wet sand, which has very different properties than dry sand and could lead to a more severe crash.

PCMS

Portable Changeable Message Boards


ROAD
WORK
AHEAD
Improperly displayed message


Brightness
improperly
displaying
TRUCKS
ENTERING
AHEAD


Poorly sited
PCMS blocked by
existing traffic
control sign.


Improperly
displayed
message.

Properly sited PCMS with unobstructed sight distance.

Properly located PCMS.

Guardrail protected.

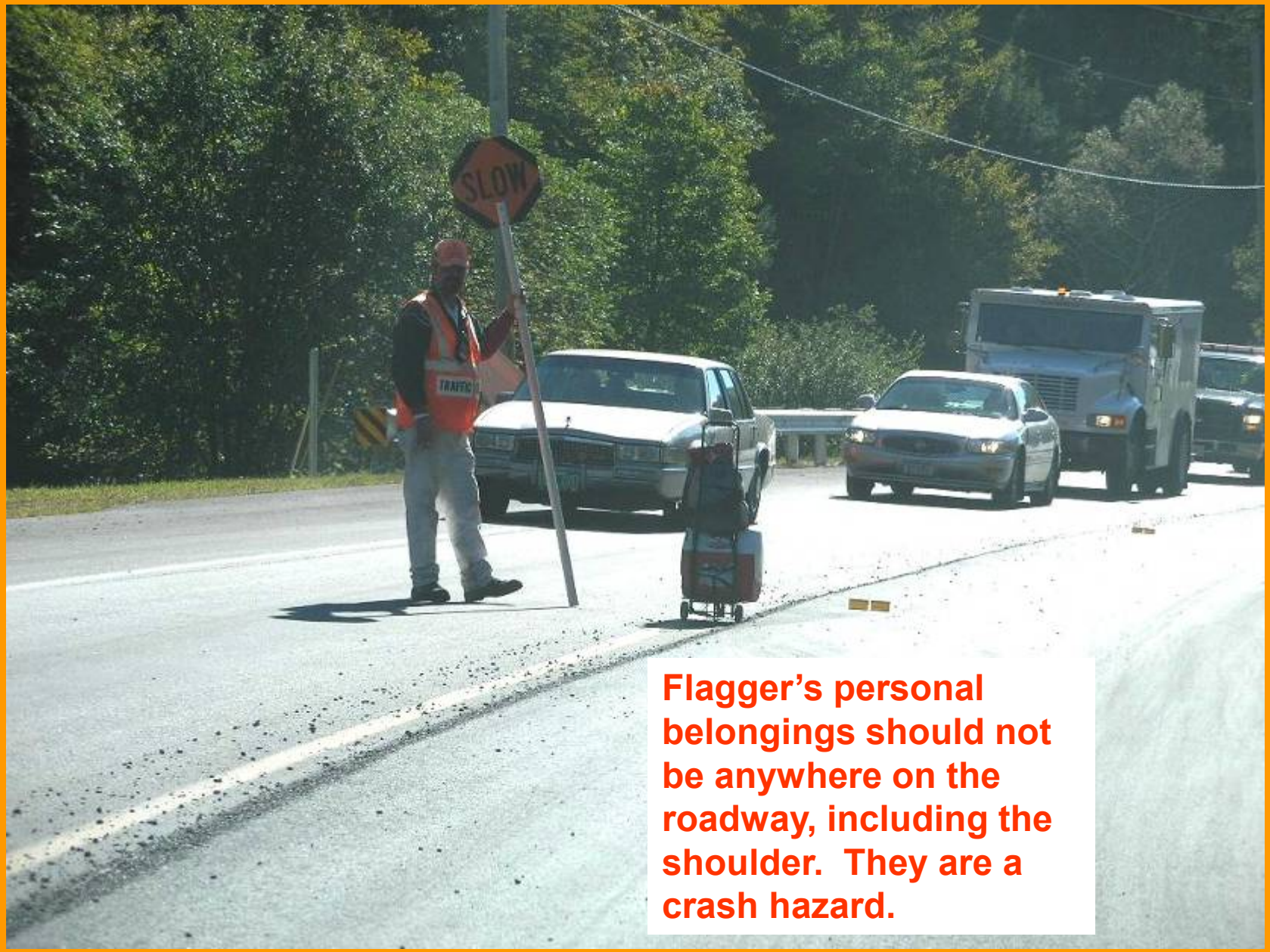
5-7 feet above roadway.

Properly located PCMS.

Flaggers

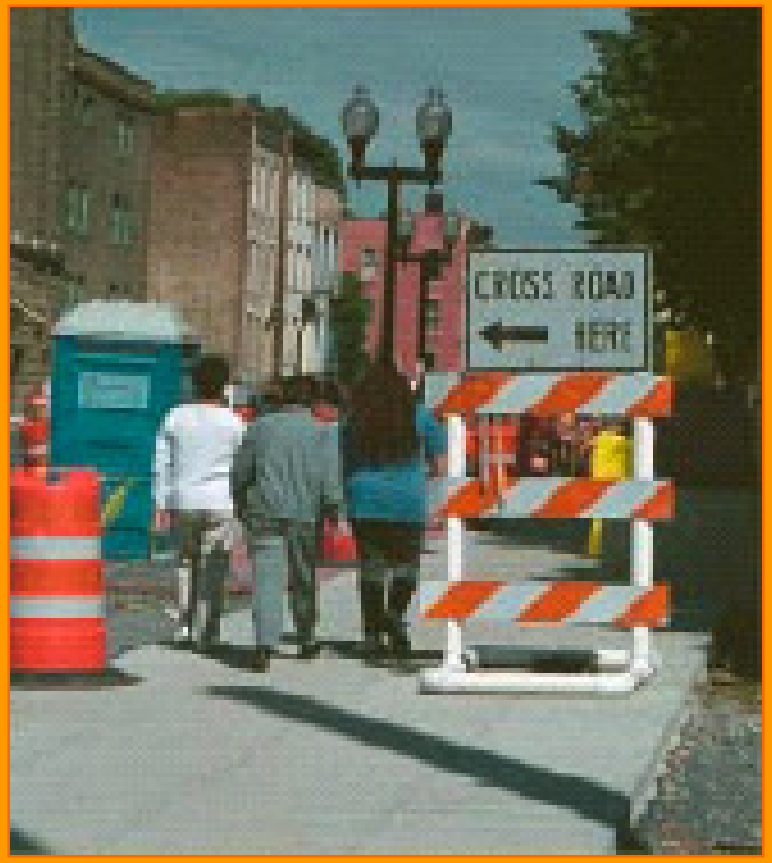

The flagger ahead symbol should be 500 feet in advance of the flagger.
08/02/2006


STOP
Flaggers must have "Traffic Control" retroreflective panel on vests.
Flagger should never turn back on traffic.



Flagger's personal belongings should not be anywhere on the roadway, including the shoulder. They are a crash hazard.

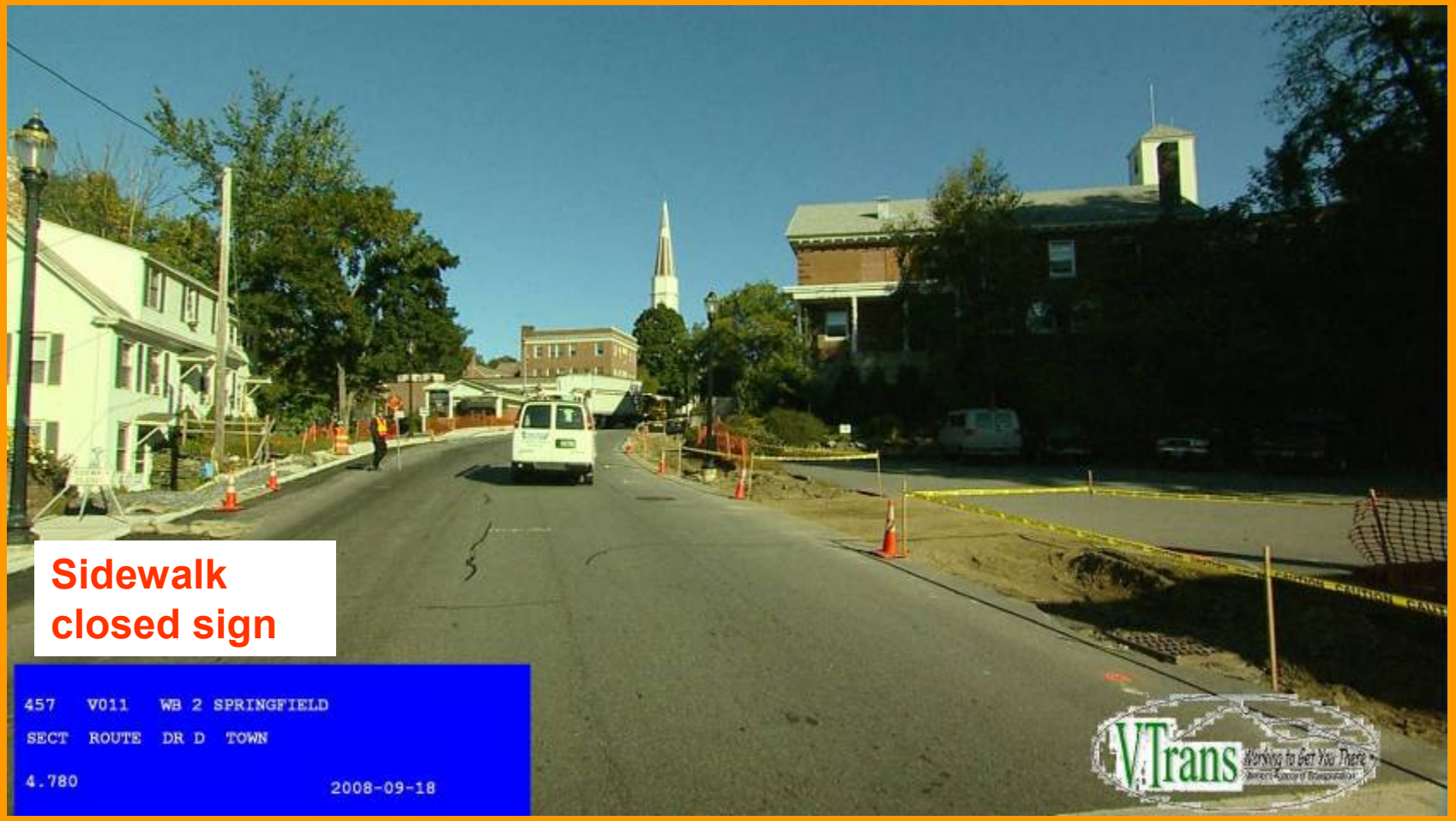
Pedestrian Accommodations



Sign obstructing sidewalk

No pedestrian accommodation

It's a start. Alternate ped path must be ADA compliant – cone bases touching or board that can be followed with cane.



So you've got a sign…but where is the ped supposed to go?

Sidewalk closed ahead, cross here

Work Zone Temporary Traffic Control Notes

- All Solid Substrate Work Zone Signs shall have ASTM Type VIII or higher Fluorescent Orange retro- reflective sheeting.
- All Roll-up work zone signs shall have ASTM Type VI Fluorescent Orange retro-reflective sheeting
- Portable sign stands shall be NCHRP 350 compliant.
- All Flaggers are required to be certified by attending an approved 4 hour Training Course.
- All Flaggers shall have a Class 2 vest with “Traffic Control” on front and back. Other workers in the work zone shall use a Class 2 vest.
- Flagger symbol signs should be at least 500 feet in advance of flagger (rural applications) and not more than 1000 feet in advance. Signs shall be moved when flagger station moves.
- Reduced Speed Zones if used, normally will go to 55 MPH on Interstates and 10 miles below existing posted speeds on other requested routes A temporary speed limit certificate signed by Director Tetreault is required.

Figure 6C-2 Types of Tapers and Buffer Spaces

Guidance on lengths of short tapers and downstream tapers

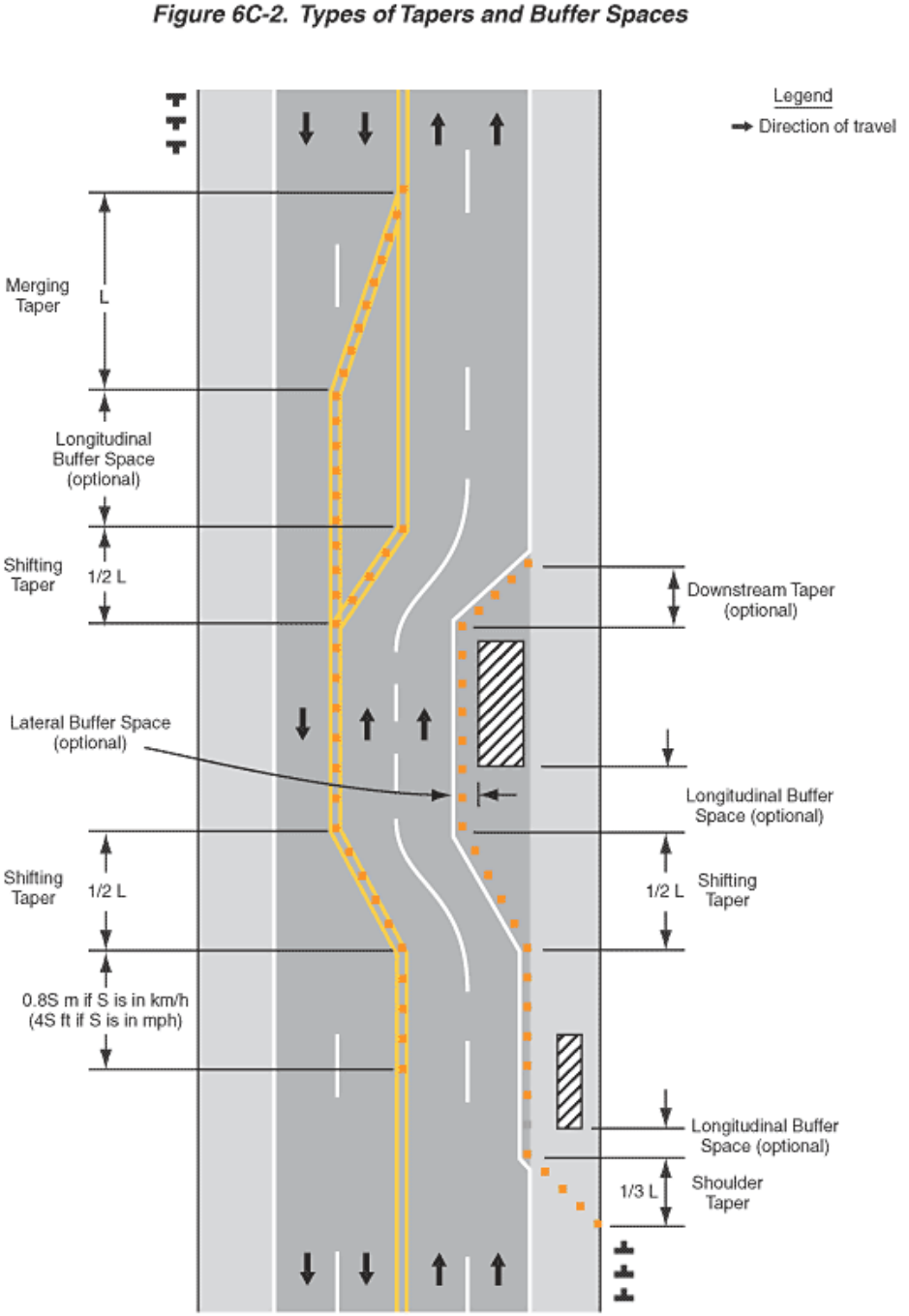


Table 6C-3 Taper Length Criteria for Temporary Traffic Control Zones

Minimum length for one-lane, two-way traffic taper added

Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	100 feet per lane

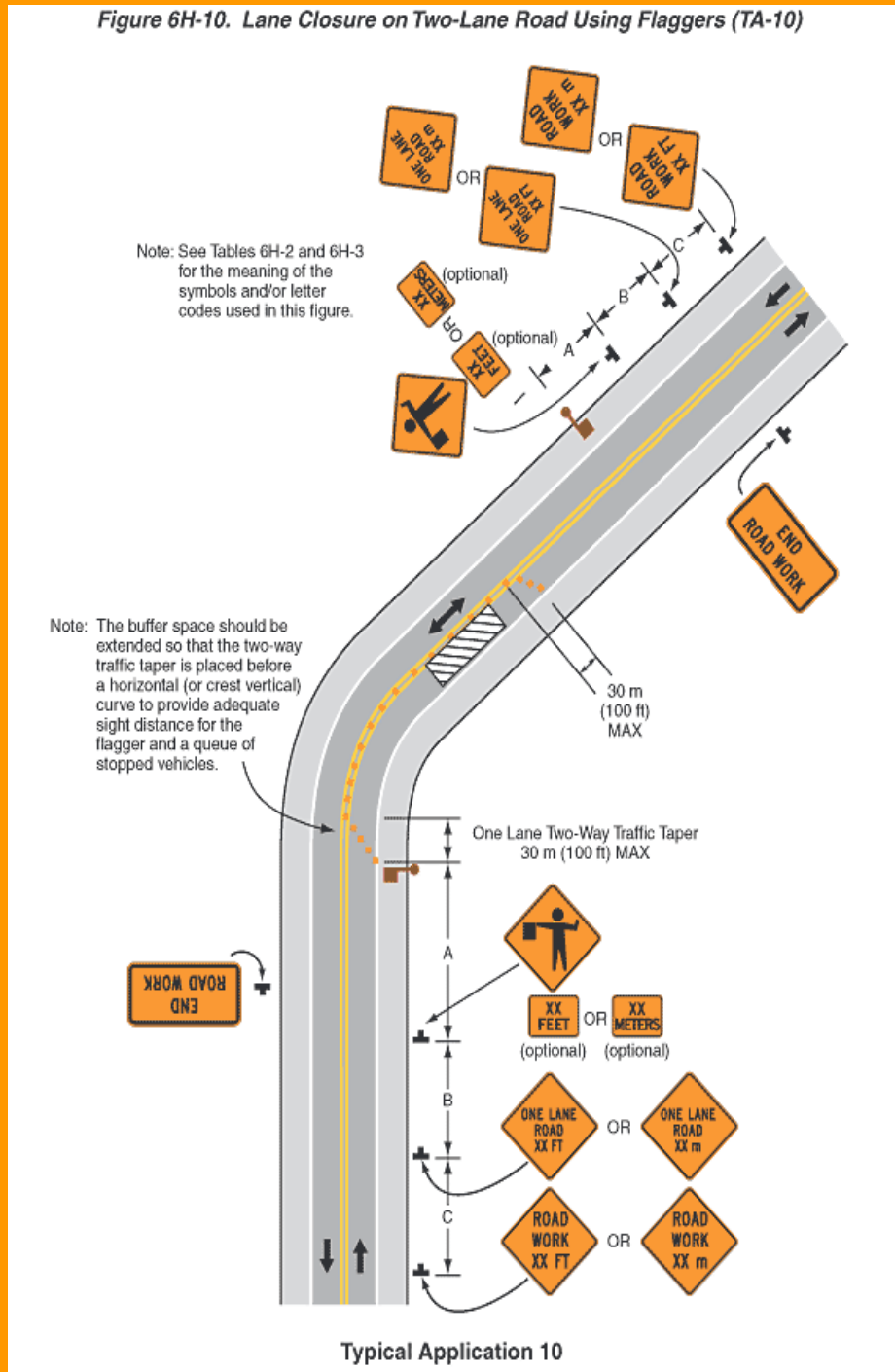
Section 6C.10

One-Lane, Two-Way Traffic Control Figure 6H-10

Clarified OPTION for self-regulating traffic movement through a one-lane, 2-way constriction

- If work space is short (adequate sight distance)

- If on a low-volume street



Section 6E.02
High-Visibility Safety Apparel

- Required for ALL WORKERS within the public right of way

- Class 2 or 3 of ANSI/ISEA 107-2004

- Applies to all roads, not just those on the Federal-aid system

- Option for law enforcement and first responders to use new ANSI "public safety vests"

- Firefighters and law enforcement are exempted from the requirement under certain conditions

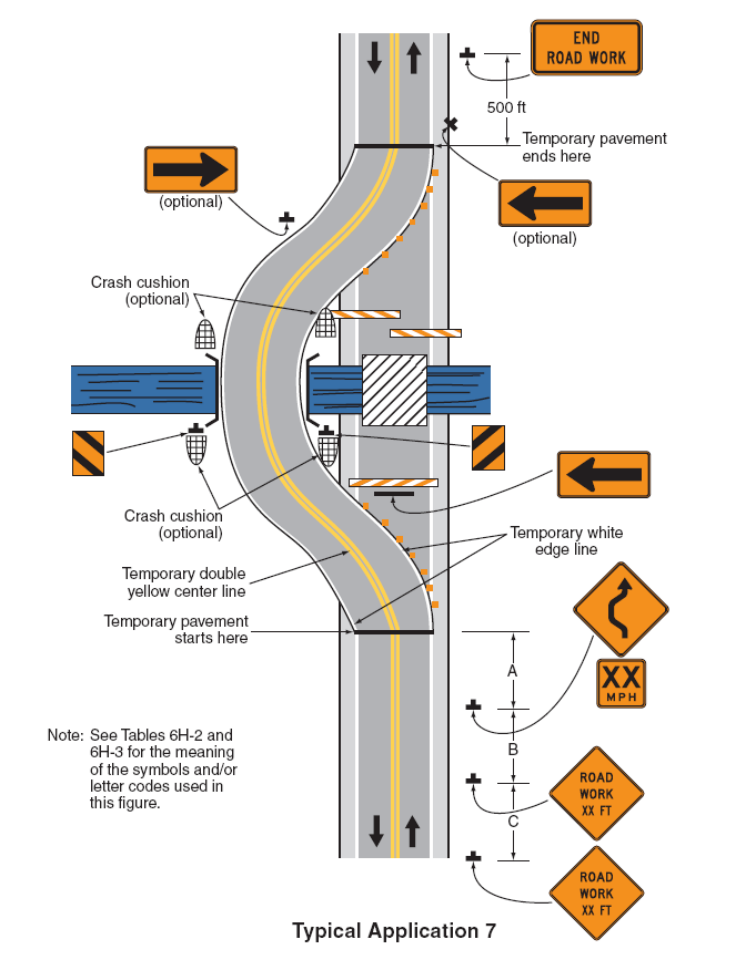
- December 31, 2011 compliance date

Section 6E.04 Automated Flagger Assistance Devices

- Two Types
  - STOP/SLOW
  - Red/Yellow Lens
- AFADs shall only be used in situations where there is only one lane of approaching traffic in the direction to be controlled
- AFADs are not traffic control signals, they shall not be used as a substitute for or a replacement for a continuously operating temporary traffic control signal
- Great for short projects, such as bridge cleaning, not meant to be left there

Section 6F.08 Road (Street) Closed Sign (R11-2)

- The ROAD (STREET) CLOSED sign shall <u>not</u> be used where road user flow is maintained through the TTC zone with a reduced number of lanes on the existing roadway or where the actual closure is some distance beyond the sign.



Section 6G.01
Typical Applications

Parade

Bike Race

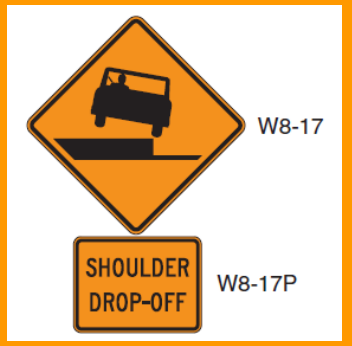
- A TTC plan should be developed for any planned special event that will have an impact on the traffic on any street or highway.

Other Topics in Part 6

- Automated Flagger Assistance Devices (AFAD)
  See sections 6E.04of the 2009 MUTCD

- New speed limit signs in TTC zone

- Signs for center lane closure, new traffic patterns , and shoulder drop-off



- Temporary delineators, RPM and their uses patterns, colors and spacing