







### Horizontal Alignment Signing

Implementing low-cost safety measures for rural roads is vital to reduce roadway crashes and deaths. One of the largest proven countermeasures for reducing fatal crashes is to address single vehicle crashes near horizontal curves. Twenty percent of all crashes occur at curves, and these crashes account for 40 percent of all fatal crashes. Furthermore, inadequate or improper signage is the leading reason for payouts related to collision or departure claims.

Horizontal alignment signing is used to advise motorists of changes in the roadway alignment consisting of advance warning signs, guidance through curve, and advisory speed plaques.

# of curves	Less than or equal to 30 mph	Greater than 30 mph
1	 W 1-1	 W 1-2
2	 W 1-3	 W 1-4
3 or more	 W 1-5	 W 1-5

MUTCD Chapter 2C provides guidance on the use of Horizontal Alignment signing and establishes standards for roadways having an Average Daily Traffic (ADT) of over 1,000 vehicles. While not required on roadways with lesser traffic volumes, improved signing can address high crash locations or be used to proactively reduce crashes on horizontal curves. MUTCD guidance is summarized below.

**Advanced warning signs**, such as the W1-1, W1-3 and W1-5, and advisory speed plaques (W13-1) are recommended on curves where the posted or 85<sup>th</sup> percentile speed is 5 mph or greater than the advisory speed and required when 10 mph or greater than the advisory speed. The specific type of advanced warning sign to be used is shown in the figure to the right. Advanced warning signs should be placed far enough in advance of the hazard to allow the sign to be seen and for a driver to decelerate to the appropriate speed. The table summarizes how far in advance signs should be placed before a horizontal curve based on the approach speed and advisory speed.

Speed	Advisory Speed (mph)				
	10	20	30	40	50
20 mph	100 ft	—	—	—	—
25 mph	100 ft	100 ft	—	—	—
30 mph	100 ft	100 ft	—	—	—
35 mph	100 ft	100 ft	100 ft	—	—
40 mph	100 ft	100 ft	100 ft	—	—
45 mph	125 ft	100 ft	100 ft	100 ft	—
50 mph	200 ft	175 ft	125 ft	100 ft	—
55 mph	275 ft	225 ft	200 ft	125 ft	100 ft
60 mph	350 ft	325 ft	275 ft	200 ft	100 ft
65 mph	450 ft	400 ft	350 ft	275 ft	200 ft
70 mph	525 ft	500 ft	450 ft	375 ft	275 ft
75 mph	625 ft	600 ft	550 ft	475 ft	375 ft



**Guidance signing**, including chevrons (W1-8) and/or One-Direction Large Arrows (W1-6), are recommended when the posted speed limit is 10 mph or greater than the advisory speed and required when 15 mph or greater. Guide signs should be oriented toward approaching traffic and spaced consistently so that two or more chevrons can be seen at one time. The table on the next

page provides a summary of chevron spacing requirements, based on the posted advisory speed.

Advisory Speed	Chevron Spacing
15 mph or less	40 feet
20 to 30 mph	80 feet
35 to 45 mph	120 feet
50 to 60 mph	160 feet
More than 60 mph	200 feet

The first figure below shows a standard signing layout for a roadway with a posted speed of 55 mph and a curve advisory speed of 35 mph. In this example, advanced warning signs (W1-2) are placed 200 feet in advance of the horizontal curve. Chevrons are then used to provide additional guidance through the curve and are placed with a spacing of 120 feet apart. The second figure shows enhanced signing, which provides dual mounted advanced warning signs and adds dual-mounted supplemented signs at the point of curvature. Note that the supplemental signs (W1-2a) which show alignment and posted speed can only be used at the point of curvature and NOT as an advanced warning sign.



For more information on setting advisory speeds for horizontal curves, see the “Setting Advisory Speeds” TapIT! Sheet.