



Roadway Safety Tips How to Sign a Curve

Curves and turns on rural roads are often tricky for drivers to negotiate, as the safe speed may be considerably lower than the safe speed on the straightaway approaching the curve. As a vehicle approaches a curve, we hope the driver will slow to an appropriate speed to negotiate the curve; however, this isn't always the case. The most frequently reported and the most serious crashes on rural roads occur at curves and turns. These are usually a single vehicle runoff-the-road crash involving a driver entering the curve at excessive speed and losing control.



Standardized, consistent signage can improve safety on these curves by improving driver expectations of what's coming ahead. If the same type of curves are always marked by the same signs, and if the advisory speeds are set in a consistent manner, then drivers know what lies ahead when they encounter those signs.

The official category of signs used to warn drivers of upcoming curves and turns is Horizontal Alignment Signs, which are informally called Curve and Turn Warning Signs. Like all warning signs, they are always black-on-yellow. Sections 2C.07 through 2C.12 in the Indiana Manual on Uniform Traffic Control Devices (MUTCD) cover the use of Horizontal Alignment Signs.

Determining if a roadway's change in direction needs to be signed should be completed through a ball bank study. This study uses a ball bank indicator to measure the overturning force (side friction, measured in degrees) on a vehicle negotiating a horizontal curve. The goal of a ball bank study is to determine the speed of travel where the overturning force stays below a defined maximum reading.

# 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

After the ball bank study is complete, reference Table 2C-5 in the Indiana MUTCD to determine whether a horizontal alignment sign is required, recommended or optional based on the difference between the approach speed (speed limit or 85th percentile speed, whichever is higher) and the advisory speed (recommended speed for the curve as determined by the ball bank study). Remember, an advisory speed is not a regulatory speed limit, therefore no ordinance is required.

Once the advisory speed is determined, it is important to install the correct curve or turn sign. The table shown here explains when each sign should be installed based on the advisory speed and the number of curves. The number of curves is determined by the changes in roadway alignment in opposite directions that are separated by a tangent distance of less than 600 feet.

Reference: Indiana LTAP Newsletter, Summer 2013

Horizontal Alignment Signs Guidelines