Chapter 2C
Warning Signs and Object Markers

• Function of warning signs
• Application and design
• Placement
• Engineering study recommended for many warning signs
• Advice against overuse
2009 Revisions to
Warning Signs and
Object Markers
Some word message signs are deleted

Also – STOP AHEAD, YIELD AHEAD, SIGNAL AHEAD
Fluorescent yellow-green color

**Required** for school and school bus signs

**Optional** for pedestrian, bike, and playground signs
36” x 36” minimum size for multi-lane conventional roads
Guidelines for advance placement of warning signs – Table 2C-4

- Change to 20/40 visual acuity
- Assumption of legibility distance of 180 feet for Condition A (speed reduction and lane change)
- Assumption of minimum legend size of 6” lettering; if less, add 100 feet
- Assumption of legibility distance of 250 feet for Condition B (stop and deceleration)
New Application of horizontal alignment signs based upon curve differential speed

Table 2C-5. Horizontal Alignment Sign Selection

<table>
<thead>
<tr>
<th>Type of Horizontal Alignment Sign</th>
<th>Difference Between Speed Limit and Advisory Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 mph</td>
</tr>
<tr>
<td>Turn (W1-1), Curve (W1-2), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), and Combination Horizontal Alignment/Intersection (W10-1) (see Section 2C.07 to determine which sign to use)</td>
<td>Recommended</td>
</tr>
<tr>
<td>Advisory Speed Plaque (W13-1P)</td>
<td>Recommended</td>
</tr>
<tr>
<td>Chevrons (W1-8) and/or One Direction Large Arrow (W1-6)</td>
<td>Optional</td>
</tr>
<tr>
<td>Exit Speed (W13-2) and Ramp Speed (W13-3) on exit ramp</td>
<td>Optional</td>
</tr>
</tbody>
</table>
Section 2C.07
Horizontal Alignment Signs

• Excellent new requirements and options
• Required for freeways, expressways, arterials and collectors with traffic volumes of 1000 vpd and over
• Optional for lower classified roadways and lesser volumes (higher crash locations ??)
New criteria for the determination of advisory speeds

Support: Among the established engineering practices that are appropriate for the determination of the recommended advisory speed for a horizontal curve are the following:

A. An accelerometer that provides a direct determination of side friction factors
B. A design speed equation
C. A traditional ball-bank indicator using the following criteria:
   - 16 degrees of ball-bank for speeds of 20 mph or less
   - 14 degrees of ball-bank for speeds of 25 to 30 mph
   - 12 degrees of ball-bank for speeds of 35 mph and higher
Sections 2C.06 thru 2C.14 Horizontal Alignment Signs

• NO CHANGE in COMPLIANCE DATE

• December 31, 2019 (2009 MUTCD)
New variations of combination horizontal alignment-intersection warning signs
Chevron signs may be mounted at 4-foot height
Section 2C.09
New Table 2C-6 for recommended spacing of Chevron signs

<table>
<thead>
<tr>
<th>Advisory Speed (mph)</th>
<th>Curve Radius (feet)</th>
<th>Sign Spacing (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 or less</td>
<td>Less than 200</td>
<td>40</td>
</tr>
<tr>
<td>20 to 30</td>
<td>200 to 400</td>
<td>80</td>
</tr>
<tr>
<td>35 to 45</td>
<td>401 to 700</td>
<td>120</td>
</tr>
<tr>
<td>50 to 60</td>
<td>701 to 1,250</td>
<td>160</td>
</tr>
<tr>
<td>More than 60</td>
<td>More than 1,250</td>
<td>200</td>
</tr>
</tbody>
</table>
Advisory Curve Speed sign is deleted
New shoulder signs and plaques

- Shoulder Ends
- Low Shoulder
- Soft Shoulder
- No Shoulder
- Shoulder Drop-Off
New Surface Condition signs
New signs and plaque to warn of conditions that primarily affect motorcyclists

- Grooved Pavement
- Metal Bridge Deck
NEW No Center Line sign
New warning signs for adverse weather conditions
New warning signs for road flooding
Section 2C.38
Speed limit reductions of more than 10 mph

Reduced Speed Limit Ahead (W3-5) sign recommended
No Merge Area plaque
New Roundabout plaque for circular intersection warning
Offset side roads and double side roads
Section 2C.49
New sign and plaque for combined pedestrian/bicycle crossing
New symbol signs to warn of possible presence of large animals
New sign to warn of a traffic pattern revision
Order of names and use of arrows when two street names appear on an advance street name plaque
Plaques for use when STOP signs control all but one approach to the intersection
Share the Road plaque cannot be used alone; can ONLY be used to supplement another sign
“New” plaque for mounting above a regulatory or advance warning sign to warn road users about a new regulation or condition
Object markers have been relocated from Part 3 since primary function is as a warning sign
Object Markers for Approach Ends of Guardrails

- Where Type 3 object markers are applied to the approach ends of guardrail and other roadside appurtenances, sheeting without a substrate shall be directly affixed to the approach end of the guardrail in a rectangular shape conforming to the size of the approach end of the guardrail, with alternating black and retroreflective yellow stripes sloping downward at a angle of 45 degrees toward the side of the obstruction on which traffic is to pass.
QUESTIONS & COMMENTS?