Introduction
• Signs, markings, and delineations are as important as civil works (geometric design, pavement quality, structures, etc.) when it comes to road safety.

• Traffic signs and markings provide vital guidance, warnings, and regulations, enhancing road safety, facilitating traffic flow, and promoting efficient transportation.
  — Quicker and correct decisions

Source: https://mothership.sg/2018/10/taiwan-toilet-elephant-giraffe-sign/
Vital Guidance

Source: https://ms-my.facebook.com/thenortheasternchronicle/photos/a.2149199991832941/5360931747326400/?type=3&theater

NHAI Blackspot Analysis – Short Term Measures

Frequently used short-term measures
- Signboard
- Rumble strip
- Solar Blinker
- Junction
- Road markings
- Pedestrian crossing
- Road studs/cat-eye
- Bar marking
- Speed limit
- Speed breaker
**International Compliance**

- Signs & Markings codes to be in harmony with Protocols on:
  - Road Signs and Signals of United Nations Conference on Road and Motor Transport, 1949
  - Vienna Convention on Road Signs and Signals, 1968.
    - Vienna Convention on Road Signs and Signals, is a multilateral treaty designed to increase road safety and aid international road traffic by standardising the signing system for road traffic (road signs, traffic lights and road markings) in use internationally.
    - India is an acceding party to the Vienna convention

**Wearing the Right Hat**

- Client
- Auditor
- Designer
### Perception & Reaction Time

**Perception distance**  
**Reaction distance**  
**Braking distance**  
**TOTAL STOPPING DISTANCE**

### Speed & Distance Traveled

<table>
<thead>
<tr>
<th>Speed (kmph)</th>
<th>Time (1 sec)</th>
<th>Time (2 sec)</th>
<th>Time (3 sec)</th>
<th>Time (4 sec)</th>
<th>Time (5 sec)</th>
<th>Time (6 sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Distance</td>
<td>m/s</td>
<td>m/s</td>
<td>m/s</td>
<td>m/s</td>
<td>m/s</td>
</tr>
<tr>
<td></td>
<td>meters</td>
<td>feet</td>
<td>meters</td>
<td>feet</td>
<td>meters</td>
<td>feet</td>
</tr>
<tr>
<td>30</td>
<td>8</td>
<td>27</td>
<td>2</td>
<td>55</td>
<td>2</td>
<td>82</td>
</tr>
<tr>
<td>40</td>
<td>11</td>
<td>36</td>
<td>36</td>
<td>73</td>
<td>36</td>
<td>109</td>
</tr>
<tr>
<td>50</td>
<td>14</td>
<td>46</td>
<td>45</td>
<td>91</td>
<td>45</td>
<td>137</td>
</tr>
<tr>
<td>60</td>
<td>17</td>
<td>55</td>
<td>54</td>
<td>109</td>
<td>54</td>
<td>164</td>
</tr>
<tr>
<td>70</td>
<td>19</td>
<td>64</td>
<td>63</td>
<td>128</td>
<td>63</td>
<td>191</td>
</tr>
<tr>
<td>80</td>
<td>22</td>
<td>73</td>
<td>72</td>
<td>146</td>
<td>72</td>
<td>219</td>
</tr>
<tr>
<td>90</td>
<td>25</td>
<td>82</td>
<td>81</td>
<td>164</td>
<td>81</td>
<td>246</td>
</tr>
<tr>
<td>100</td>
<td>28</td>
<td>91</td>
<td>90</td>
<td>182</td>
<td>90</td>
<td>273</td>
</tr>
<tr>
<td>110</td>
<td>31</td>
<td>100</td>
<td>99</td>
<td>200</td>
<td>99</td>
<td>301</td>
</tr>
<tr>
<td>120</td>
<td>33</td>
<td>109</td>
<td>108</td>
<td>219</td>
<td>108</td>
<td>328</td>
</tr>
</tbody>
</table>
## Road Provisions & Furniture Codes

### Road Provisions Codes
- IRC 67 – Road Signs
- IRC 35 – Road Markings
- IRC 79 - Road Delineators
- IRC SP 85 - VMS
- IRC 46 - Advertisement & Hoardings

### Road Scenario Codes
- IRC SP 48 - Hill Roads
- IRC SP 55 - Work Zone
- IRC SP 91 – Tunnel Road
- IRC SP 73 – Two Lane
- IRC SP 84 – Four Lane
- IRC SP 87 – Six Lane
- IRC SP 98 – Expressway

### Other Specifications
- MoRTH Circulars & Specifications
- MoRD Circulars & Specifications
- IRC 103 Pedestrian Facilities
- IRC 99 – Traffic Calming Measures
- IRC SP 88 – Road Safety Audit

---

### Which one is correct?

![Image of road sign](image)
Testing-3

Testing-4
# Traffic Sign Attributes

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Attribute</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Understandability</td>
<td>The ease with which the symbol can be understood</td>
</tr>
<tr>
<td>2</td>
<td>Reaction Time</td>
<td>How quickly the meaning of the sign can be identified</td>
</tr>
<tr>
<td>3</td>
<td>Legibility Distance</td>
<td>Greatest distance at which the symbol can be clearly “read”</td>
</tr>
<tr>
<td>4</td>
<td>Glance Legibility</td>
<td>The ease with which the symbol can be read if the symbol is seen for only a fraction of a second</td>
</tr>
<tr>
<td>5</td>
<td>Conspicuity</td>
<td>The extent to which a sign can be easily detected in visually complex environment</td>
</tr>
<tr>
<td>6</td>
<td>Learnability</td>
<td>The extent to which the meaning of a symbol can be learned and remembered</td>
</tr>
</tbody>
</table>

# Signing Principles - the 6 Cs

- **Conspicuous** easily seen
- **Clear** legible, able to be read in time
- **Comprehensible** understood
- **Credible** believed
- **Consistent** same symbols, and placements, across the network
- **Correct** the sign must be correct
IRC 67 - 2022
Code of Practice for Road Signs

<table>
<thead>
<tr>
<th>Publication</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Published</td>
<td>March 1978</td>
</tr>
<tr>
<td>First Revision</td>
<td>July 2001</td>
</tr>
<tr>
<td>Second Revision</td>
<td>May 2010</td>
</tr>
<tr>
<td>Third Revision</td>
<td>July 2012</td>
</tr>
<tr>
<td>Fourth Revision</td>
<td>December, 2022</td>
</tr>
</tbody>
</table>

Overview

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td>Purpose, Principles, Placement &amp; Operations, Maintenance, and Uniformity</td>
</tr>
<tr>
<td>Why</td>
<td>Safe, uniform &amp; efficient operation</td>
</tr>
<tr>
<td>How</td>
<td>Orderly movement through notifying road user</td>
</tr>
<tr>
<td>What</td>
<td>Regulatory, warning &amp; information</td>
</tr>
<tr>
<td>Where</td>
<td>Expressways, National Highways, State Highways, Major District Roads, Other Rural Roads, Urban City Roads</td>
</tr>
</tbody>
</table>
| Basic requirements               | 1. Fulfill a need  
2. Command attention  
3. Convey a clear and simple meaning  
4. Command respect from road user  
5. Give adequate time for response |
| Power to erect traffic signs      | Section 116 of MV Act                                                                                                                        |
| Duty to obey traffic signs        | Section 119 of MV Act                                                                                                                        |
Placement & Operations

- Placement & Operations
  - Decision to install through traffic engineering study
  - Should be within the road user’s view
  - Conveying proper meaning
  - Provide adequate response time to road users to read and take action at the operating speed
  - Unnecessary road signs should be removed

- Uniformity
  - A standard sign, used where it is not appropriate, is as objectionable as a nonstandard sign.
  - Uniformity assists road users, traffic police and highway agencies by giving everyone the same interpretation message.
  - Uniformity also promotes efficiency in the manufacture, installation, and maintenance
Classification of Road Signs

- **Mandatory/Regulatory signs**: give notice of traffic laws or regulations*.
- **Cautionary/Warning signs**: give notice of a situation that might not be readily apparent*.
- **Informatory/Guide signs**: show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information*.

*Definitions provided are from MUTCD 2009

---

A. Mandatory/Regulatory Signs

- **Shape**: Mostly Circular
- **Prohibitions** on vehicle maneuver or vehicle type

- **Positive guidance**

- **Other**

<table>
<thead>
<tr>
<th>Type</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prohibitory</td>
<td>Red Ring</td>
</tr>
<tr>
<td></td>
<td>White background</td>
</tr>
<tr>
<td></td>
<td>Black symbols or arrows</td>
</tr>
<tr>
<td></td>
<td>Diagonal red bar</td>
</tr>
<tr>
<td>Positive guidance</td>
<td>Blue background</td>
</tr>
<tr>
<td></td>
<td>White symbol</td>
</tr>
</tbody>
</table>

---
Consistency

Conspicuous easily seen | Clear legible, able to be read in time | Comprehensible understood | Credible believed | Consistent same symbols, and placements, across the network | Correct the sign must be correct

Fulfill a need | Command attention | Convey a clear and simple meaning | Command respect from road user | Give adequate time for response
Consistency

GIVE WAY

YIELD

RIGHT OF WAY

Australia

Laos

Qatar

UK

Israel

Japan
### A. Mandatory/Regulatory Signs

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Sign Name</th>
<th>Purpose</th>
<th>Shape, size &amp; colour</th>
<th>Remarks</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stop Sign</td>
<td>For indication priority of ROW</td>
<td>Shape - Octagonal, Colour - Red</td>
<td>located such that it does not impair major road visibility</td>
<td><img src="image" alt="Stop Sign" /></td>
</tr>
<tr>
<td>2</td>
<td>Give Way Sign</td>
<td>Assign ROW at intersection</td>
<td>Equilateral triangle with apex downward Colour - white with red borders</td>
<td>location at way ahead where vehicle required to slow or stop, say 1.5 m to 12 m</td>
<td><img src="image" alt="Give Way Sign" /></td>
</tr>
<tr>
<td>3</td>
<td>Prohibitory Sign</td>
<td>Indicates prohibited maneuver</td>
<td>Circular shape, red border, white background, black text</td>
<td>Two wheeler prohibited, bullock cart prohibited etc.</td>
<td><img src="image" alt="Prohibitory Sign" /></td>
</tr>
<tr>
<td>4</td>
<td>No Parking Sign</td>
<td>To guide for no stop and no parking</td>
<td>Circular with red border and blue background</td>
<td>No stopping/No standing</td>
<td><img src="image" alt="No Parking Sign" /></td>
</tr>
<tr>
<td>5</td>
<td>Speed limit Sign</td>
<td>To guide for speed limit</td>
<td>Circular shape, white background, red border, black text and numerals</td>
<td>Signs erected for length and height restricted vehicle advance to the restricted zone</td>
<td><img src="image" alt="Speed limit Sign" /></td>
</tr>
<tr>
<td>6</td>
<td>Compulsory Sign</td>
<td>To guide direction to the vehicle</td>
<td>Circular shape, blue background, white border of 2 mm having symbols in white</td>
<td>Cyclist only, pedestrians only etc.</td>
<td><img src="image" alt="Compulsory Sign" /></td>
</tr>
</tbody>
</table>

Source: TRL 701 Student Project – Alok Kumar Jha & Saurabh Singh

### B. Cautionary/Warning Signs

- **Shape Size & Colour**
  - Equilateral triangle with apex upwards
  - Red border, black border, and white background
- **Location and mounting**
  - Should not be mounted on the same post of the Stop/Give-way sign
  - Warning signs should be based on 85th percentile speed
- **Examples**
B. Cautionary/Warning Signs

<table>
<thead>
<tr>
<th>Design speed</th>
<th>Size</th>
<th>Side (mm)</th>
<th>Border (mm)</th>
<th>Clear Visibility Distances (m)</th>
<th>Distance of sign from hazard (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 50 kmph</td>
<td>Small</td>
<td>600</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>51 - 65 kmph</td>
<td>Medium</td>
<td>750</td>
<td>60</td>
<td>60</td>
<td>45 - 110</td>
</tr>
<tr>
<td>66 - 80 kmph</td>
<td>Normal</td>
<td>900</td>
<td>70</td>
<td>60</td>
<td>110 - 180</td>
</tr>
<tr>
<td>&gt; 80 kmph</td>
<td>Large</td>
<td>1200</td>
<td>90</td>
<td>90</td>
<td>180 - 245</td>
</tr>
</tbody>
</table>

C. Informatory/Guide Signs

- Objective: Provide information to road users to help them along the route in the simplest and direct
- Shape: Rectangular
- Use
  - Facility directions
  - Destination names
C. Informatory/Guide Signs

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Sign Name</th>
<th>Purpose</th>
<th>Shape, size &amp; colour</th>
<th>Remarks</th>
<th>Images</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Direction and Place Identification signs</td>
<td>Give driver advance information for approach, type of junction and identify route within it's network</td>
<td>Rectangular in shape</td>
<td>Types – Advance direction Signs, Destination signs, truck layby, toll booth head etc.</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>2</td>
<td>Facility Information Sign</td>
<td>Information regarding facility and service available in the vicinity</td>
<td>Shape Rectangular Blue Background, White symbol in rectangular block</td>
<td>Types- eating place, resting place, first aid post, toilet, hospital, public telephone, U turn ahead, industrial area</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>3</td>
<td>Other Useful Information Signs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-a</td>
<td>Parking Sign</td>
<td>Display of parking information</td>
<td>Shape Rectangular Blue Background, White symbol in rectangular block</td>
<td>Types – Auto rikshaw parking, cycle parking, scooter and motorcycle parking</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td>3-b</td>
<td>Flood Gauge</td>
<td>To display height of flood level above road level</td>
<td></td>
<td>Installed at causeway and submersible bridges/culvert</td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
</tbody>
</table>

Source: TRL 701 Student Project – Alok Kumar Jha & Saurabh Singh

Example (Option-1)

Conspicuous easily seen | Clear legible, able to be read in time | Comprehensible understood | Credible believed | Consistent same symbols, and placements, across the network | Correct the sign must be correct

Fulfill a need | Command attention | Convey a clear and simple meaning | Command respect from road user | Give adequate time for response
Example (Option-2)

Conspicuous easily seen | Clear legible, able to be read in time | Comprehensible understood | Credible believed | Consistent same symbols, and placements, across the network | Correct the sign must be correct

Fulfill a need | Command attention | Convey a clear and simple meaning | Command respect from road user | Give adequate time for response
Sign Siting

- Usually, signs are provided on the left side of the road.
- In the case of hill roads usually provided on the valley side unless traffic and road conditions warrant these to be placed on the hillside.
- Gantry-mounted signs should be mounted on columns preferably 7 m or more from the nearest traffic lane unless otherwise specified. If not, provide crash barriers.

Source: TRL 701 Student Project – Mehraab, Abhishek, Piyush

Sign Siting

- Roads with shoulder (with or without kerb)
  - 600 mm to 3 m
- Roads without shoulder
  - Min 1 m away
- For roads with kerbs
  - Min 300 mm away
  - Should not hinder pedestrian movement
- Overhead signs may be considered, if:
  - Traffic volume at or near capacity
  - Complex interchange design
  - Three or more lanes in each direction
  - Restricted visibility
  - High speed traffic
  - Insufficient space for ground mounted signs
  - Large percentage of commercial vehicles
  - Closely spaced intersections

Source: TRL 701 Student Project – Mehraab, Abhishek, Piyush
Sign Siting – Height & Clearance

Table 4.1 Height and Clearance Required for Sign Placement

<table>
<thead>
<tr>
<th></th>
<th>Minimum (mm)</th>
<th>Desirable (mm)</th>
<th>Maximum (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>600</td>
<td>1000</td>
<td>2500</td>
</tr>
<tr>
<td>B</td>
<td>1000</td>
<td>2000</td>
<td>3000</td>
</tr>
<tr>
<td>C</td>
<td>300</td>
<td>600</td>
<td>1000</td>
</tr>
<tr>
<td>D</td>
<td>2000</td>
<td>2000</td>
<td>2500</td>
</tr>
<tr>
<td>E</td>
<td>2100</td>
<td>2100</td>
<td>2500</td>
</tr>
<tr>
<td>F</td>
<td>5500</td>
<td>6000</td>
<td>6500</td>
</tr>
<tr>
<td>G</td>
<td>750</td>
<td></td>
<td>5000</td>
</tr>
<tr>
<td>H</td>
<td>9000</td>
<td>7000</td>
<td>9000</td>
</tr>
<tr>
<td>J</td>
<td>1600</td>
<td>2000</td>
<td>2500</td>
</tr>
</tbody>
</table>

Fig. 4.1 Typical Siting of Signs with respect to Carriageway (Heights and Clearances) (Refer: Table 4.1 for values)

Sign Orientation

- Most signs: Perpendicular to travel direction
- Parking signs: 15° to carriageway for better visibility
- If light reflection: sign to be turned to 95°
- Horizontal curves
  - Fixed normal to carriageway
  - Angle of placement to determined with regard to the course of the approaching traffic
- Vertical curves
  - Signs could be tilted to improve viewing angle

Fig. 5.1 Sign Orientation with respect to Carriageway
Sign Material

- **Concrete**: Concrete shall be of M25 grade.
- **Reinforcing Steel**: Reinforcing steel shall conform to the requirements of **IS 1786** unless otherwise specified.
- **Bolts, Nuts and Washers**: High strength bolts shall conform to **IS 1367** whereas precision bolts, nuts, etc. shall conform to **IS 1364**.
- **Plates and Supports**: Plates and support sections for the signposts shall conform to **IS 226** and **IS 2062** or any other stated IS specification.
- **Substrate**: The substrate shall be either Aluminum sheeting or Aluminum Composite Material (ACM) conforming to TABLE 6.1

### Table 6.1 Specifications for Aluminum Composite Material (ACM)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Description</th>
<th>Specification for 4 mm</th>
<th>Specification for 3 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard Test</td>
<td>Acceptable Value</td>
<td>Acceptable Value</td>
</tr>
<tr>
<td>A</td>
<td>Mechanical Properties of ACM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Peel off strength with retro</td>
<td>ASTM D903</td>
<td>Min. 4 N/mm²</td>
</tr>
<tr>
<td></td>
<td>reflective sheeting. (Drum Test)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Tensile strength</td>
<td>ASTM E638</td>
<td>Min. 40 N/mm²</td>
</tr>
<tr>
<td>3</td>
<td>0.2% Proof Stress</td>
<td>ASTM E638</td>
<td>Min. 34 N/mm²</td>
</tr>
<tr>
<td>4</td>
<td>Elongation</td>
<td>ASTM E638</td>
<td>Min. 6 %</td>
</tr>
<tr>
<td>5</td>
<td>Flexural strength</td>
<td>ASTM C393</td>
<td>Min. 130 N/mm²</td>
</tr>
<tr>
<td>6</td>
<td>Shear strength with punch shear test</td>
<td>ASTM D732</td>
<td>Min. 18 N/mm²</td>
</tr>
<tr>
<td>B</td>
<td>Properties of Aluminium Skin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Tensile strength (Rm)</td>
<td>ASTM E8</td>
<td>Min. 150 N/mm²</td>
</tr>
<tr>
<td>2</td>
<td>Modulus of elasticity</td>
<td>ASTM E8</td>
<td>Min. 70,000 N/mm²</td>
</tr>
<tr>
<td>3</td>
<td>Elongation</td>
<td>ASTM E8</td>
<td>A₀, Min. 2%</td>
</tr>
<tr>
<td>4</td>
<td>0.2 % Proof Stress</td>
<td>ASTM E8</td>
<td>Min. 110 N/mm²</td>
</tr>
</tbody>
</table>
Night Driving

- Reduced visibility and field of vision
- Glare from oncoming headlights
- Blindspots
- Fatigue
- Impaired vision

Source: NRDA Training Program, Road Furniture and Signage Including Night-Time Safety
Retro Reflectivity Impact

Day vs. Night

Because what you see during the day

Is not always what you get at night!
Retro Reflectivity Impact

Source: Relative visual comparison of stop signs with different grades of retroreflective sheeting (Persaud et al. 2008)

Signs - Retroreflectivity

CLASS A Sheet: Engineering and Super Engineering Grade Sheet as per ASTM D 4956 Type I and II.

CLASS B Sheet: High Intensity and High Intensity Prismatic Grade Sheet as per ASTM D 4956 Type III and IV.

CLASS C Sheet: All Micro Prismatic Grade Sheet as per ASTM D 4956 Type VIII, IX and XI.
Signs shall be provided with retro-reflective sheeting and/or overlay film. The reverse side of all signs shall be painted grey. Except in the case of railway level crossing signs, the signposts shall be painted in 250 mm wide bands, alternately black and white. The lowest band next to the ground shall be in black. For more details refer Tables 8.1 and 8.2.

**Signs – Road Type: Colours & Fonts**

**Colours**

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Background</th>
<th>Arrows/Border/Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressway</td>
<td>Blue</td>
<td>White</td>
</tr>
<tr>
<td>National Highway (NH)</td>
<td>Green</td>
<td>White</td>
</tr>
<tr>
<td>State Highway (SH)</td>
<td>Green</td>
<td>White</td>
</tr>
<tr>
<td>Major District Road (MDR)</td>
<td>Green</td>
<td>White</td>
</tr>
<tr>
<td>Village Road (ODR &amp; VR)</td>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>Urban/City Road</td>
<td>Blue</td>
<td>White</td>
</tr>
<tr>
<td>Tourism Related Signs</td>
<td>Brown</td>
<td>White</td>
</tr>
<tr>
<td>Temporary/Work zone Signs</td>
<td>Yellow</td>
<td>Black</td>
</tr>
</tbody>
</table>

**Fonts**

<table>
<thead>
<tr>
<th>Sr No.</th>
<th>Language</th>
<th>Font Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hindi</td>
<td>Hindi7/Narad Bold</td>
</tr>
<tr>
<td>2</td>
<td>English</td>
<td>Transport Medium</td>
</tr>
<tr>
<td>3</td>
<td>Regional Language</td>
<td>As per local practice</td>
</tr>
</tbody>
</table>
Signs – Road Type: Colours & Fonts

• Four sizes
  • 600 mm
  • 750 mm
  • 900 mm
  • 1200 mm

• Exceptions
  • Expressways (>120kmph): 1500 mm for cautionary and regulatory signs
  • Conjunction with traffic signals or on-bollards on traffic island: 300 mm for mandatory/regulatory signs
Signs - Size

Fig. 14.38 Maximum Speed Limit (Vehicle Type)

Signs - Visibility

• Backing board for Pedestrian Signal
  – Use with discretion (only when other measures to improve visibility fail)
  – The backing board fluorescence can be a distraction in itself
Signs – Letter Size and Siting of Information Signs

<table>
<thead>
<tr>
<th>Design Speed (Kmph)</th>
<th>Advance Direction Signs (Shoulder Mounted)</th>
<th>Flag Type Direction Signs</th>
<th>Overhead Direction Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;x&quot; height (mm) lower case</td>
<td>&quot;x&quot; height (mm) upper case</td>
<td>Minimum clear visibility to the sign (m)</td>
</tr>
<tr>
<td>Up to 30</td>
<td>70</td>
<td>100</td>
<td>55</td>
</tr>
<tr>
<td>31 - 50</td>
<td>100</td>
<td>140</td>
<td>75</td>
</tr>
<tr>
<td>51 - 65</td>
<td>125</td>
<td>175</td>
<td>95</td>
</tr>
<tr>
<td>66 - 80</td>
<td>175</td>
<td>245</td>
<td>130</td>
</tr>
<tr>
<td>81 - 100</td>
<td>215</td>
<td>300</td>
<td>160</td>
</tr>
<tr>
<td>101 - 120</td>
<td>305</td>
<td>425</td>
<td>230</td>
</tr>
<tr>
<td>121 - 150</td>
<td>340</td>
<td>475</td>
<td>255</td>
</tr>
</tbody>
</table>

Note: Where there are site/space constraints, 80 percent of the values shall be adopted for x height

Visibility Funnel

- Visibility funnel for STOP sign
Gateway Sign

- Approach to Town/Village

The Cyrus Mistry Crash

Source: https://www.cartoq.com/
The Cyrus Mistry Crash

Understandability
Understandability

Signs can:
• Regulate road use
• Warn of a hazard
• Inform the road user
• Help the road user navigate

but also:
• Distract the road user
• Be a hazard
• Provide incorrect/inconsistent information

Signs cannot:
• Educate the road user
• Physically prevent an action from occurring
• Be 100% effective
• Replace necessary civil works

Source: ADB/RSI "PRACTICAL ROAD SAFETY ENGINEERING" ONLINE WORKSHOP, 2020: Module 5 Signs, lines and delineation
IRC 35 - 2015
Code of Practice for Road Markings

<table>
<thead>
<tr>
<th>Publication</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Published</td>
<td>October 1970</td>
</tr>
<tr>
<td>First Revision</td>
<td>August 1997</td>
</tr>
<tr>
<td>Second Revision</td>
<td>January 2015</td>
</tr>
</tbody>
</table>

One-way or Two-way?
What does it mean?

What do these mean?

- Broken Yellow Line
- Double Solid Yellow Line
- Solid Yellow Line
- Broken White Line
- Double Solid White Line
- Solid White Line
- Dotted White Line
Definition

- Road markings are defined as **lines, patterns, words** except road signs which are applied or attached to the carriageway or kerbs or to objects within or adjacent to the carriageway for **controlling, warning, guiding and informing the road users**.
Material

Thermoplastic

- Most used
- Fast drying time
- Life of 2 to 3 years

Solvent-borne and Water-borne

- Used in temporary Work Zone
- Water based are eco-friendly

Cold Applied

- Audible
- Durable and better luminating

Adhesive Tapes

- ASTM D4592-12
- High initial cost
- Easy to apply
- Good for areas with high traffic

Source: TRL 701 Student Project – Mehraab, Abhishek, Piyush

Material

- Thermoplastic Markings
  - Mixture of plasticizer and resins that serves to hold all of the other ingredients together
  - Applied hot in molten state adheres to pavement and get solidified immediately at the ambient temperature.
  - Fast drying time, highly durable – 2 to 3 years depending on traffic volumes

- Solvent borne and Waterborne Road Marking Paints
  - Oldest form of pavement marking material
  - Short period – work zones, etc.

- Cold Applied Plastics
  - Best for coloured pavement marking
  - Audible raised pavement marking for edge lines
  - Retains original colour longer and higher luminance values

- Preformed Adhesive Tapes:
  - Confirmation to ASTM D4592-12
  - Service life of 3 to 6 months
Colours

- White
  - Because of the visibility and good contrast against the road surface, the white colour should be widely used for road markings.

- Yellow
  - The longitudinal marking in yellow colour should be used to convey message where it is not permitted to cross the markings. Yellow colour is also used to show parking restrictions and to impose other traffic control.

- Blue
  - The blue colour should be used to indicate new and special markings which are not conventional.

- Green
  - The green colour should be deployed to distinguish the bicycle and non-motorised transport facilities provided on the road.

- Red/Purple
  - Where multiple road users are sharing the road space on hazardous locations
Retro-reflectivity

- Use of glass beads for retro-reflectivity
- Quality of glass beads correlates with retro-reflectivity

Marking Performance

- Key Factors
  - Road Surface
  - Traffic
  - Environmental
- Material selection to consider local factors
- Durability & retro-reflectivity performance
  - material composition;
  - application procedure;
  - application machines;
  - roadway surface and
  - presence of immediate traffic.
Pavement Marking Classification

1. Longitudinal
   - Provided for guiding the traffic movements.
   - Broken lines, single/double continuous lines and continuous lines are longitudinal markings.
   - Broken longitudinal markings can be crossed, while continuous can’t be crossed
   - Provided to direct the forward movement and control the overtaking manoeuvring.

2. Transverse
   - The marking provided across the carriageway for traffic control
   - Broken lines, single/ double continuous lines such as Stop marking and Give way marking
   - Compliance is Vital, as they establish traffic control

3. Hazard
   - Facilitates traffic merging/diverging, prohibiting to cross-over and to deflect the traffic ahead of hazardous situations.
   - Generally done with chevron and diagonal marking, hatch marking and Prohibitory marking

4. Block

5. Arrow

6. Directional

7. Facility
Pavement Marking Classification

- Block Marking (BM)
  - The zebra crossing for pedestrians, triangular and checkered marking for speed breakers and Giveaway symbol which are painted in blocks on carriageway
- Arrow Marking (AM)
  - Direction for driver to take mandatorily are classified under Arrow Marking
- Directional Marking (DM)
  - The word message which are directional nature are classified under Directional Marking
- Facility Marking (FM)
  - The marking for parking, the word messages for buses, cyclists and disabled ones are classified under Facility Marking
Pavement Marking Classification

- Centre Line:
  - The longitudinal marking are generally provided along the traffic movement. The broken lines, single/double continuous lines and continuity. The center lines should be used only on single carriageway roads to separate the opposite streams of traffic and to facilitate their movements.
  - Center line is offset from center location if:
    - Carriageway width transition location
    - Additional turning lanes at junctions
    - Odd number of lanes on vertical and horizontal curves with limited sight distances
    - Urban roads with parking permitted on one side only
    - Urban roads with odd number of lanes with extra lanes allotted to the predominant direction of flow.
    - On curves with extra widening are classified under Longitudinal Marking and abbreviated as LM01, LM02, LM03 etc. for easy referencing.
The road studs to be placed on broken longitudinal markings and it shall always be placed at the centre of gap and shall never be upon the line segment or by the side of line segment.

In the case of the road studs to be placed on carriageway having a paved shoulder, it shall be placed outside the shoulder side edge line and shall be set back by 50 mm from the edge line.

In the case of the roads studs provided on median side edge, it is to be again ensured that it shall not be on the median line marking, but shall be in hard strip or kerb shyness width, keeping at least 50 mm set back distance from median side edge line by ensuring a minimum 100 mm clearance distance from the vertical face of the raised kerb.

White road studs are to indicate traffic lane line and center of carriageway.

Red road studs are to be used to indicate a line which should not be crossed, for road studs to be used on shoulder side edge line.

Used to delineate right side edge of carriageway i.e., median side edge line.

Green road studs are to be employed to indicate crossable edge line like the lay byes and acceleration/deceleration lanes on left hand side.
STOP and GIVEWAY Marking (Section 6)

- Stop line indicates the location on the ground beyond which the vehicles should not proceed where it is in laid such as at the vicinity of traffic signals, pedestrian zebra crossings and on minor road approaches merging with major roads it is provided in conjunction with the stop sign.

- Stop lines shall not be used unless traffic control by any one of these means exist.
  - Single Stop Lines
    - Single Stop Line shall be applied in traffic signal and ahead of pedestrian crossing.
    - Single Stop Lines shall ordinarily be located not less than 2 metres and not more than 3 metres in advance from the desired location.
  - Double Stop lines
    - The Double Line is used exclusively at junctions controlled by “STOP” signs.

- Giveaway markings are two broken lines and are generally provided on minor roads at intersection that are not controlled by any traffic controlling measures.
MARKING FOR TRANSITION AND LANE CHANGE (Section 7)

- Diagonal and Chevron marking
  - Channelizing markings like diagonal and chevron markings are utilized to demarcate the neutral area at the nose of a channelizing island which can help in reducing the incidence of collision with kerb nose.
  - These markings provide for proper and safe use of acceleration and deceleration lanes.
  - The basic function is to inform the driver about the area/lane(s) which is set aside for the exclusive use of traffic on the main highway and thus enable the driver to adequately distinguish between through traffic lanes and the acceleration and deceleration lanes.

Example (non-Indian)
Marking (Contd.)

- **Lane Changing and Diverging/Merging lines**
  - The lane change and merging/diverging marking are provided to separate the auxiliary/slip lane and through lanes.
  - The lane change and merging and diverging at multilane highways will be critical.

- **Hatch markings**
  - Where traffic has to be deflected in an unusual situation, mere edge line will not be effective, hatch marking should be considered.

- **Lane reduction / narrowing situations and transitions**
  - The reduction and transition of traffic lanes are frequent and generally carried out in the case of four lane divided carriageway getting reduced to 2-lane bi-directional carriageway condition.
  - In such situations, the drivers should be properly guided to transfer from 4-lane to 2-lane and vice versa. If one or more lanes are to be discontinued, the centre line and the lane lines should be merged in such a way that traffic safely merged on to the reduced number of lanes.

Marking (Contd.)

Lane Change Marking and Nose Length in Multilane Highways

Four Lane to Two Lane Transition (Concentric)
ARROWS AND WORD MESSAGES (Section 8)

• Directional Arrows
  • Directional arrows should be used in advance to guide drivers to correct lane when approaching busy intersections whether signal controlled or not.

• Mandatory Turn Arrows
  • Lane arrows supplemented with the legend “TURN LEFT”, “TURN RIGHT” and “AHEAD ONLY” is prescribed. These versions may be used only where they indicate the effect of a statutory prohibition.

• Guidance Arrows
  • These are marked in the junction area where some guidance to traffic is considered to be helpful.

• Deflection Arrows
  • Deflection arrows are used in advance to warn of the approaching restriction and to direct the traffic to the correct lane and also to warn of a hazard or change of direction and to indicate the side on which traffic should pass.

Arrows (contd.)

• Bifurcation arrows
  • The bifurcation arrow should be provided at the commencement of deceleration lanes on the approach to junctions to guide vehicles ensuring that the full length of the lane is used to slow down for the junction without impeding the through vehicles on the main carriageway.
Word Messages

Markings at At-Grade Intersection (Section 9)

Table 8.3 Size of Letterings

<table>
<thead>
<tr>
<th>Speed</th>
<th>Length of Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 50 kmph</td>
<td>1.25 m</td>
</tr>
<tr>
<td>51 - 100 kmph</td>
<td>2.5 m</td>
</tr>
<tr>
<td>&gt; 100 kmph &amp; Expressways</td>
<td>5 m</td>
</tr>
</tbody>
</table>
At-Grade (Contd.)

Fig. 9.12 Typical Marking for Signalized Junction (Urban Section)

At-Grade (Contd.)

Fig. 9.5 Hatch Marking and Ghost Island
Marking for Grade-Separated Intersection (Section 10)

Merging/Diverging (Without Lane Gain/Lane Drop)

Markings for Speed Reduction Measures, Pedestrian Crossing & Cyclists (Section 11)

NOTE:
- In an un-signalised crossing, pedestrian crossing marking shall be around 2 to 3 m from stop line.
- In a signalised crossing, pedestrian marking around 1 to 1.5 m in advance of a primary signal.

Fig. 11.3 Pedestrian Crossing
MARKINGS FOR BUSES, TRUCK LAY-BY AND TOLL PLAZA (Section 12)

Fig. 12.1 Bus Lane
MARKINGS FOR BUSES, TRUCK LAY-BY AND TOLL PLAZA (Contd.)

Fig. 12.3 Bus Bay

Fig. 12.4 Truck Lay-by

Parking and Restrictions (Section 13)

Fig. 13.1 On-Street Parking

111

112
### ANNEXURE: A
(Refer Section 3 Under Para 3.2)

**TABLE: A.2: TRANSVERSE MARKINGS (TM)**

<table>
<thead>
<tr>
<th>Marking Abbreviation</th>
<th>Type</th>
<th>Length of Line Segment (mm)</th>
<th>Length of Gap (mm)</th>
<th>Width (mm)</th>
<th>Colour</th>
<th>Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>TM01</td>
<td>Continuous</td>
<td>One Solid Line</td>
<td></td>
<td>200</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>TM02</td>
<td>Continuous</td>
<td>One Solid Line</td>
<td></td>
<td>300</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>TM03</td>
<td>Continuous</td>
<td>Two Solid Line</td>
<td>Each Solid Line of 200mm</td>
<td>White</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TM04</td>
<td>Broken</td>
<td>600</td>
<td>300</td>
<td>100</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>TM05</td>
<td>Broken</td>
<td>600</td>
<td>300</td>
<td>150</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>TM06</td>
<td>Broken</td>
<td>600</td>
<td>300</td>
<td>200</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>TM07</td>
<td>Broken</td>
<td>600</td>
<td>300</td>
<td>Each Broken Line of 200mm</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td>TM08</td>
<td>Bar Marking (One Set)</td>
<td>Across Full Carriageway</td>
<td>6 Strips of 300mm wide, 5mm high @ 600mm apart</td>
<td>Yellow</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Cyrus Mistry Crash

Source: https://www.cartoq.com/

Figure 2B-14. Examples of Applications of Lane-Reduction Transition Markings

Source: MUTCD
IRC SP 055 - 2014
Guidelines on Traffic Management in Work Zones

Publication
First Published: July 2001
First Revision: January 2014

Section 1 Introduction
1.1 Background
1.2 Purpose of Work Zone Traffic Management Plans (WTMPs)
1.3 Who Should Prepare WTMPs?
1.4 What Can Make WTMPs Effective?
1.5 Judicial Application of WTMPs
1.6 Legal Aspects of WTMPs

Section 2 Commonly Used Terms

Section 3 Principles of Work Zone Traffic Management Plans
3.1 Basic Principles of WTMP
3.2 Planning of WTMP
3.2.1 Provide safety for road users and workers
3.2.2 Minimize hindrance or delay to road users
3.2.3 Provide clear and positive guidance to road users
3.3 Ensure road safety
3.4 Ensure that planners and decision makers have the necessary knowledge
3.5 Provide good public relations
3.6 Primary Features of WTMP
3.7 Requirements of Work Zone Traffic Management Plan
3.8 WTMP in Urban Areas
3.9 WTMP in Rural Areas

Section 4 Temporary Traffic Control Zones
4.1 Introduction
4.2 Elements of Temporary Traffic Control Zone
4.2.1 Advance warning zone
4.2.2 Approach transition zone
4.2.3 Activity zone
4.2.4 Terminal transition zone
4.2.5 Work zone end

Section 5 Traffic Control Devices
5.1 Types of Devices
5.1.1 Road Signs
5.1.2 Reflective sign backing for road signs
5.1.3 Design of signs
5.1.4 Regulatory signs
5.1.5 Warning signs
5.1.6 Informational signs
5.2 Channelizing Devices
5.2.1 Traffic cones
5.2.2 Tactile markers
5.2.3 Hazard markers
5.2.4 Drums
5.2.5 Barriers
5.2.6 Driveway isolation barriers
5.2.7 New jersey barriers
5.2.8 Water-filled barriers
5.2.9 Detachable edging for pedestrian
5.2.10 Railheaders
5.3 Temporary Protective Markings & Road Studs
5.3.1 Road stud
5.4 Lighting Devices & Variable Message Signs
5.4.1 Lighting devices
5.4.2 Flashing warning beacons
5.4.3 Portable variable message signs
5.4.4 Flashing lights
5.4.5 Temporary traffic control signals
5.4.6 Portable variable message signs
5.4.7 Arrive boards

Section 6 Measures for Vulnerable Road Users (VRUs)
6.1 Measures for VRUs
6.2 Guidance
6.3 Barriers for Pedestrians & Cyclists

Section 7 Traffic Management Practices at Workzones
7.1 Introduction
7.2 Alternatives One Way Operations
7.2.1 Traffic control by private and taxi system
7.2.2 Traffic control by priority signs
7.2.3 Traffic control by on-ramp, off-ramp
7.2.4 Traffic control by portable traffic signals
7.2.5 Diversion
7.2.6exit
7.2.7 Traffic control by local traffic
7.2.8 Use of Shoulder or as a Travel Lane
7.2.9 High Construction
7.2.10 Advantages and Disadvantages of Work Zone Design Strategies

Section 8 Roles and Responsibilities
8.1 Introduction
8.2 Work Zones
8.2.1 Road authority
8.2.2 Road operator
8.2.3 Project director/In-charge
8.2.4 Designer
8.2.5 Road safety auditor
8.2.6 Contractor
8.2.7 Consultant
8.2.8 Supervision consultant/Independent Inspector
8.2.9 Local police
8.2.10 General public/Community
Work Zone Crashes

- Work zone accidents are caused by several factors such as:
  - frequently changing environment that occurs during road work whereby the driver is often surprised
  - insufficient warning signs for normal and construction traffic
  - lack of audible warning to workers
  - inadequate provisions of safety devices to protect workers

- Major contributing factors to work zone accidents are:
  - Drivers not paying sufficient attention
  - Going too fast for the prevailing conditions
  - Failure to yield the right-of-way
  - Following too close.

Work Zone Control Devices

- Three Types of Devices
  - Road Signs
  - Channelizing Devices
  - Lighting Devices & Variable Message Signs
Work Zone Definition

Traffic Control Zone

Work Zone Site Marking & Signage

Fig. 5.3 Signs Mounted on Barricades
### Work Zone – Shape and Color Pattern

<table>
<thead>
<tr>
<th>Category</th>
<th>Colour</th>
<th>Shape</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory/Mandatory</td>
<td>As given in IRC:67-2012</td>
<td>Circular</td>
<td>[Road Closed]</td>
</tr>
<tr>
<td>Work Zone Regulatory (WR) Signs</td>
<td>Red &amp; White</td>
<td>Rectangular</td>
<td>[Road Works Ahead]</td>
</tr>
<tr>
<td>Normal Warning (NW) Signs</td>
<td>As given in IRC:67-2012 but in yellow background</td>
<td>Triangular</td>
<td>[Cycle Track]</td>
</tr>
<tr>
<td>Work Zone Warning (WW) Signs</td>
<td>Black &amp; Yellow</td>
<td>Rectangular</td>
<td>Wear cycle Nearing Point</td>
</tr>
<tr>
<td>Work Zone Information Signs (IS)</td>
<td>Black &amp; Yellow</td>
<td>Rectangular</td>
<td>Fig. 5.1 Shape &amp; Color Pattern of Signs in WTMP</td>
</tr>
<tr>
<td>Work Zone Direction on Signs (DS)</td>
<td>Black &amp; Yellow</td>
<td>Rectangular</td>
<td></td>
</tr>
</tbody>
</table>

---

### Warning Signs

![Warning Signs](image)

**Fig. 5.6 Application of Normal Warning Sign**

- Fig. WZWN05/1: Sign to indicate change of direction to left in a work zone.
- Fig. WZWN05: Sign to indicate change of direction to right in a work zone.
- Fig. WZWN06: Sign in case of a relevant road closed or detour indefinitely in a work zone.
- Fig. WZWN07: Sign to indicate that traffic must follow detour route.
- Fig. WZWN08: Sign to indicate that traffic must follow detour route.
- Fig. WZWN09: Sign to indicate that traffic must follow detour route.
- Fig. WZWN10: Sign to indicate that traffic must follow detour route.
- Fig. WZWN11: Sign to indicate that traffic must follow detour route.
- Fig. WZWN12: Sign to indicate that traffic must follow detour route.
- Fig. WZWN13: Sign to indicate that traffic must follow detour route.
- Fig. WZWN14: Sign to indicate that traffic must follow detour route.
- Fig. WZWN15: Sign to indicate that traffic must follow detour route.
- Fig. WZWN16: Sign to indicate that traffic must follow detour route.
- Fig. WZWN17: Sign to indicate that traffic must follow detour route.
- Fig. WZWN18: Sign to indicate that traffic must follow detour route.
- Fig. WZWN19: Sign to indicate that traffic must follow detour route.
- Fig. WZWN20: Sign to indicate that traffic must follow detour route.
- Fig. WZWN21: Sign to indicate that traffic must follow detour route.
- Fig. WZWN22: Sign to indicate that traffic must follow detour route.

**Fig. 5.6 Application of Normal Warning Sign (Continued)**

- Fig. WZWN05: Sign to indicate that traffic must follow detour route.
- Fig. WZWN06: Sign to indicate that traffic must follow detour route.
- Fig. WZWN07: Sign to indicate that traffic must follow detour route.
- Fig. WZWN08: Sign to indicate that traffic must follow detour route.
- Fig. WZWN09: Sign to indicate that traffic must follow detour route.
- Fig. WZWN10: Sign to indicate that traffic must follow detour route.
- Fig. WZWN11: Sign to indicate that traffic must follow detour route.
- Fig. WZWN12: Sign to indicate that traffic must follow detour route.
- Fig. WZWN13: Sign to indicate that traffic must follow detour route.
- Fig. WZWN14: Sign to indicate that traffic must follow detour route.
- Fig. WZWN15: Sign to indicate that traffic must follow detour route.
- Fig. WZWN16: Sign to indicate that traffic must follow detour route.
- Fig. WZWN17: Sign to indicate that traffic must follow detour route.
- Fig. WZWN18: Sign to indicate that traffic must follow detour route.
- Fig. WZWN19: Sign to indicate that traffic must follow detour route.
- Fig. WZWN20: Sign to indicate that traffic must follow detour route.
- Fig. WZWN21: Sign to indicate that traffic must follow detour route.
- Fig. WZWN22: Sign to indicate that traffic must follow detour route.

---

**Fig. 5.7 Application of Normal Warning Sign**

- Fig. WZWN05/1: Sign to indicate change of direction to left in a work zone.
- Fig. WZWN05: Sign to indicate change of direction to right in a work zone.
- Fig. WZWN06: Sign in case of a relevant road closed or detour indefinitely in a work zone.
- Fig. WZWN07: Sign to indicate that traffic must follow detour route.
- Fig. WZWN08: Sign to indicate that traffic must follow detour route.
- Fig. WZWN09: Sign to indicate that traffic must follow detour route.
- Fig. WZWN10: Sign to indicate that traffic must follow detour route.
- Fig. WZWN11: Sign to indicate that traffic must follow detour route.
- Fig. WZWN12: Sign to indicate that traffic must follow detour route.
- Fig. WZWN13: Sign to indicate that traffic must follow detour route.
- Fig. WZWN14: Sign to indicate that traffic must follow detour route.
- Fig. WZWN15: Sign to indicate that traffic must follow detour route.
- Fig. WZWN16: Sign to indicate that traffic must follow detour route.
- Fig. WZWN17: Sign to indicate that traffic must follow detour route.
- Fig. WZWN18: Sign to indicate that traffic must follow detour route.
- Fig. WZWN19: Sign to indicate that traffic must follow detour route.
- Fig. WZWN20: Sign to indicate that traffic must follow detour route.
- Fig. WZWN21: Sign to indicate that traffic must follow detour route.
- Fig. WZWN22: Sign to indicate that traffic must follow detour route.

---

**Fig. 5.8 Application of Normal Warning Sign (Continued)**

- Fig. WZWN05: Sign to indicate that traffic must follow detour route.
- Fig. WZWN06: Sign to indicate that traffic must follow detour route.
- Fig. WZWN07: Sign to indicate that traffic must follow detour route.
- Fig. WZWN08: Sign to indicate that traffic must follow detour route.
- Fig. WZWN09: Sign to indicate that traffic must follow detour route.
- Fig. WZWN10: Sign to indicate that traffic must follow detour route.
- Fig. WZWN11: Sign to indicate that traffic must follow detour route.
- Fig. WZWN12: Sign to indicate that traffic must follow detour route.
- Fig. WZWN13: Sign to indicate that traffic must follow detour route.
- Fig. WZWN14: Sign to indicate that traffic must follow detour route.
- Fig. WZWN15: Sign to indicate that traffic must follow detour route.
- Fig. WZWN16: Sign to indicate that traffic must follow detour route.
- Fig. WZWN17: Sign to indicate that traffic must follow detour route.
- Fig. WZWN18: Sign to indicate that traffic must follow detour route.
- Fig. WZWN19: Sign to indicate that traffic must follow detour route.
- Fig. WZWN20: Sign to indicate that traffic must follow detour route.
- Fig. WZWN21: Sign to indicate that traffic must follow detour route.
- Fig. WZWN22: Sign to indicate that traffic must follow detour route.

---
Channelization

Fig. 5.10 Traffic Cones

Fig. 5.11 Tubular Markers

Fig. 5.12 Hazard Markers OHM (Left & Right) & THWM

Fig. 5.14 Drum

Fig. 5.15 Standard Barricades

Lighting Devices

Fig. 5.23 Types of Lighting Devices
Warning Signs in IRC SP055-2014

Incorrect Signage Example - 1

| 16+400 | Construction zone should have barricading as specified in IRC SP-55 Using flagman is good practice and it should be followed at all the diversions |
| Flag man present but the diversion is poorly maintained. Inadequate barricading. Poor diversion sign. | Diversion sign age as per IRC SP-55 should be used |
### Incorrect Signage Example - 2

<table>
<thead>
<tr>
<th>48+000 Package 2</th>
<th>Nonstandard Signages</th>
<th>Standard signages as per IRC SP 55 should be used</th>
</tr>
</thead>
</table>

There is not enough time to do all the nothing we want to do.

*Bill Watterson*