

Lecture 3.17

3.2 Traffic Signs

Classification of Traffic Signs (IRC:67)

Indian Roads Congress code IRC:67 classifies road traffic signs into three distinct categories based on their operational function and legal obligation.

Each category uses specific shapes, borders, background colors, and symbol formats so that drivers can instantly recognize the nature of the sign from a distance even before reading the message.

Category	Shape	Function
Mandatory	Circular	Legal obligations and prohibitions
Cautionary	Triangular (Apex up)	Warning of hazards ahead
Informational	Rectangular	Guidance, routes, facility info
Special Signs	Variable	Temporary work zone, variable messages

Mandatory and Regulatory Signs: Purpose and Features

Mandatory signs inform road users of specific laws, regulations, restrictions, and prohibitions. Violation of mandatory signs is a punishable traffic offense under the Motor Vehicles Act.

Except for two critical exceptions (STOP sign and GIVE WAY sign), all mandatory signs are circular in shape with a red border, white or blue background, and black symbols.

- Shape: Circular (standard radius/diameter based on approach speed)
- Color Code: Red circular ring/border, white background, black symbol
- Prohibition Slash: Red diagonal cross-bar indicating prohibited actions
- Legal Weight: Enforceable by law enforcement agencies with penal fines

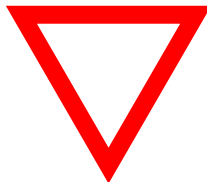
Special Mandatory Signs: STOP and GIVE WAY

The STOP sign and GIVE WAY sign are the two most critical priority control signs on road networks. Because of their supreme importance, they are assigned unique geometric shapes.

Their unique outlines allow drivers approaching from opposing or cross-traffic directions to recognize them even from the rear side, ensuring clear right-of-way awareness.



STOP Sign
Mandates complete halt



GIVE WAY Sign
Yield right-of-way

Key Categories of Mandatory Signs

Mandatory signs are subdivided into directional control signs, movement prohibition signs, speed limit signs, and parking/standing restriction signs.

Drivers must obey these signs continuously throughout the zone marked by the signs or up to the 'End of Restriction' sign.

- Prohibition Signs: No Entry, No Right Turn, No U-Turn, No Overtaking
- Vehicle Class Restrictions: No Heavy Vehicles, No Pedestrians, No Cyclists
- Speed Limit & Load Limit: Maximum Speed (e.g., 50 km/h), Axle Load Limit (e.g., 5t)
- Compulsory Direction Signs: Compulsory Ahead, Turn Left, Keep Left (Blue circle)

Cautionary and Warning Signs: Characteristics

Cautionary signs warn road users of existing or potential hazardous conditions on or near the roadway ahead. They advise drivers to reduce speed or exercise extra caution.

All cautionary signs are equilateral triangles with the apex pointing upwards, featuring a prominent red border, white background, and clear black warning pictogram.

- Shape: Equilateral Triangle with apex pointing vertically upward
- Color Code: Red border, white background, black symbol/pictogram
- Function: Early warning of alignment changes, physical hazards, or cross-traffic
- Advance Placement: Installed 50m to 120m ahead of hazard depending on speed

Common Cautionary Sign Symbols

Cautionary symbols are designed as intuitive pictograms that represent physical road conditions without requiring lengthy text reading.

Drivers must recognize these symbols instantaneously under daytime and nighttime driving conditions.

- Alignment Hazards: Sharp Curve (Left/Right), Hairpin Bend, Reverse Bend
- Road Geometry Changes: Narrow Road Ahead, Narrow Bridge, Gap in Median
- Intersection Warnings: Cross Road, Side Road Junction, T-Junction, Roundabout
- Traffic Hazards: Pedestrian Crossing, School Ahead, Railway Crossing (Guarded/Unguarded)

Informational and Direction Signs

Informational signs guide drivers along routes, inform them of upcoming destinations, distance to towns, route numbers, and location of roadside services and facilities.

These signs are rectangular in shape. Background colors are standardized to indicate the class of highway or type of facility.

Green Background NH / SH / Expressways	Blue Background Urban & Facilities
Yellow Background Rural (PMGSY)	White Background Local Info / Tourist

Directional, Advance Direction, and Re-assurance Signs

Directional signage systems guide drivers seamlessly through complex inter-city highway networks and urban interchanges.

They follow a logical sequence: Advance Direction Sign -> Intersection Direction Sign -> Re-assurance Sign after the junction.

- Advance Direction Sign: Placed 500m to 1km ahead of major highway interchange
- Flag Sign / Intersection Sign: Located at the actual point of turn at junction
- Re-assurance Sign: Confirms route number and distance (km) to upcoming towns
- Route Marker Signs: Shield signs displaying National Highway (NH) numbers

Retroreflective Sheeting Materials and Standards

Modern traffic signs must be visible at night without dedicated external lighting. This is achieved using retroreflective microprismatic sheeting applied to aluminum backing plates.

Retroreflectivity redirects light from vehicle headlights straight back to the driver's eye lens. IRC:67 specifies different ASTM sheeting types based on highway class.

- Type III (High Intensity Encapsulated Lens): Suitable for low-speed urban streets
- Type IV & VIII (Microprismatic): Standard for State Highways and National Highways
- Type XI (Ultra-High Intensity Microprismatic): Used for Expressways and overhead signs
- Substrate Material: Composite Aluminum Panel (ACP) or high-grade Aluminum sheet

Sign Installation and Placement Geometry

Improper placement compromises sign visibility, reduces reaction time, or creates physical obstacles for errant vehicles.

IRC:67 specifies exact mounting heights, lateral offsets from the carriageway edge, and tilt angles to eliminate headlight specular glare.

- Mounting Height: Minimum 2.0m (urban) and 1.5m (rural) from kerb/shoulder crown
- Lateral Offset: 0.6m to 3.0m clear distance from outer edge of paved shoulder
- Specular Glare Tilt: Sign face turned 3 degrees away from 90-degree road perpendicular
- Overhead Clearance: Minimum 5.5m vertical clearance for gantries across lanes

Summary of Traffic Signs

In this lecture, we thoroughly covered the classification, design features, color schemes, and installation specifications for traffic signs as per IRC:67.

Understanding sign geometry, retroreflective sheeting, and placement principles enables civil engineers to design effective roadside signage.

- Mandatory Signs: Circular, red border; STOP (octagon) and GIVE WAY (inverted triangle)
- Cautionary Signs: Triangular apex-up, red border, white background, black symbol
- Informational Signs: Rectangular; Green (NH/SH), Blue (Urban), Yellow (Rural)
- Retroreflectivity: Microprismatic sheeting (Type IV, VIII, XI) for night visibility
- Installation: Strict lateral offsets, mounting heights (1.5-2.0m), 3° anti-glare angle