MODERNISATION OF TRAFFIC SIGN AND MARKINGS (INDIA V/S OTHER COUNTRY) FOR EFFECTIVE TRAFFIC MANAGEMENT: STATE OF ART

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ABSTRACT - *Highly populous countries like India are facing problem of increase in demand of transport facilities which has lead to heavy motorization. Exponential increase in number of vehicles compared to snail pace improvement of road causes many problems like traffic congestion, high accident rate and insufficient facilities. Focus in this paper is on increase in number of accidents due to insufficient provision of signs and road markings at any intersection. For safe and efficient traffic management, signs and markings must be designed and implemented in a way that the messages they convey are clear, unambiguous, visible and legible and give sufficient time to respond safely. Also, the significant improvement and maintenance is required for proper utilization of signs and markings by its users. This study will help other researchers to bring change or adopt new improvements in signs and markings while practicing in order to ensure safety and maintain smooth flow of traffic at any intersection.*

KEY WORD: Intersection accident rate, traffic signs, road markings, reaction time of road users

1. INTRODUCTION

Clear and efficient signing and marking is an essential part of highway and traffic engineering. Signs and markings are used to control and guide traffic and to promote road safety. Micronesia is believed to have one of the safest road networks in the world according to the WHO report 2015 and the quality of its traffic signs and markings make a significant contribution to this.

Signage and carriageway markings should comply with the Traffic Signs Regulations and General Directions (TSRGD). Any signs that are not prescribed in the TSRGD must be authorised by the Secretary of State, Great Britain (England, Scotland and Wales).

To be effective, signs and markings must be designed and implemented in a way that the messages they convey are clear, unambiguous, visible and legible. At the same time these should give warning to drivers and road users with sufficient time to respond safely. Maintenance of signs and markings is important.

Distraction can also be caused by looking for a sign that may be missing. Therefore, continuity of directional signing is important. Young (aged 17-21) drivers are particularly prone to external-to-vehicle driver distraction caused by signs. The risk factor associated with sign clutter is also shown to be highest at junctions and on long monotonous roads (such as motorways).

There is increasing interest and research into traffic management schemes aimed at simplifying the road environment, through methods such as the removal of unnecessary signs to reduce complexity and driver confusion. However, too few signs and markings can cause driver confusion, poor traffic management and inappropriate speeding. Conversely, too many signs and markings are known to cause cluttering and mental overload. Poorly designed and placed signs and their over-provision detract from the environment, and affect road safety by distracting the road user.

1.1. History of traffic signs till end of 20th century

Traffic signs or road signs are signs erected at the side of or above roads to give instructions or provide information to road users. The earliest signs were simple wooden or stone milestones as shown in Fig. 1 (a). Later, signs with directional arms were introduced, for example, the fingerposts in the United Kingdom and their wooden counterpart in Saxony shown as in Fig. 1 (b).

(a) Milestone Sign (b) Wooden Post

Fig. 1

With traffic volumes increasing since the 1930s, many countries have adopted pictorial signs or otherwise simplified and standardized their signs to overcome language barriers, and enhance traffic safety. Such pictorial signs use symbols in place of words and are usually based on international protocols. Such signs were first developed in Europe in 1968 and have been adopted by most countries to varying degrees.

The first modern road signs erected on a wide scale were designed for riders of high or "ordinary" bicycles in the late 1870s and early 1880s. These machines were fast, silent and their nature made them difficult to control, moreover their riders travelled considerable distances and often preferred to tour on unfamiliar roads. For such riders, cycling organizations began to erect signs that warned of potential hazards ahead (particularly steep hills), rather than merely giving distance or directions to places, thereby heralding the sign type that defines "modern" traffic signs.

Over the years, change was gradual. Pre-industrial signs were stone or wood, but with the development of Darby's method of smelting iron using coke, painted cast iron became favoured in the late 18th and 19th centuries. Cast iron continued to be used until the mid-20th century, but it was gradually displaced by aluminium or other materials and processes, such as vitreous enamelled and/or pressed malleable iron, or (later) steel. Since 1945 most signs have been made from sheet aluminium with adhesive plastic coatings; these are normally retro reflective for night time and low-light visibility. Before the development of reflective plastics, reflectivity was provided by glass reflectors set into the lettering and symbols.

1.2 21thcentury: modern signs and information dissemination techniques

New generations of traffic signs based on electronic displays can also change their text (or, in some countries, symbols) to provide for "intelligent control" linked to automated traffic sensors or remote manual input. In over 20 countries, real-time Traffic Message Channel incident warnings are conveyed directly to vehicle navigation systems using inaudible signals carried via FM radio, 3G cellular data and satellite broadcasts. Finally, cars can pay tolls and trucks pass safety screening checks using video number plate scanning, or RFID transponders in windshields linked to antennae over the road, in support of on-board signalling, toll collection and travel time monitoring.

Yet another "medium" for transferring information ordinarily associated with visible signs is RIAS (Remote Infrared Audible Signage), e.g., "talking signs" for print-handicapped (including blind/low-vision/illiterate) people. These are infra-red transmitters serving the same purpose as the usual graphic signs when received by an appropriate device such as a hand-held receiver or one built into a cell phone.

1.3 ROAD SIGNS IN INDIA

Road signs in the Republic of India are similar to those used in some parts of the United Kingdom, except that they are multilingual.

In 2012, the Tourism department of Kerala announced plans to upgrade road signs in the state to include maps of nearby hospitals. The Noida Authority announced plans to replace older signboards with new fluorescent signage.

Some of the road signs, in different categories of regulation used in India are shown in Fig. 2, 3 & 4.

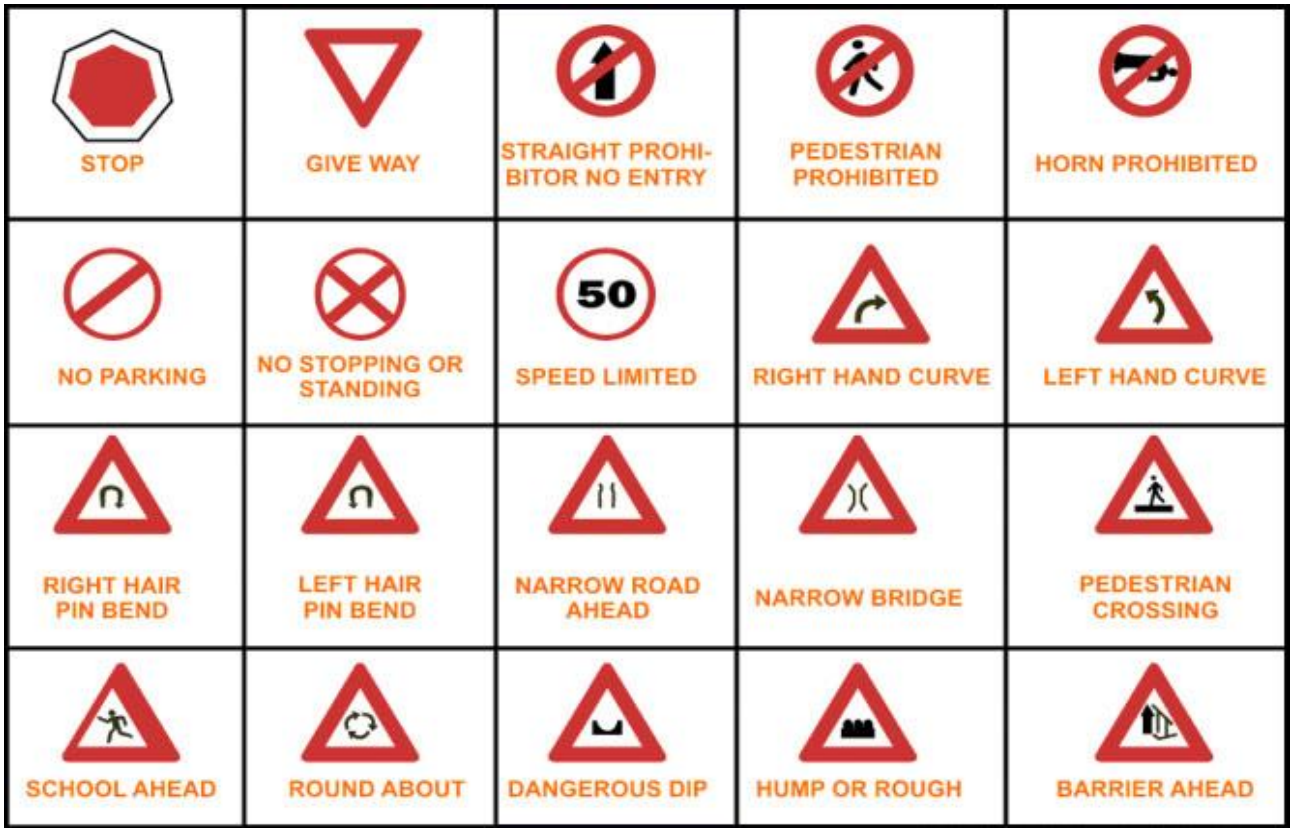

Fig. 2 Mandatory Signs

(Indian Traffic Rules and Signals)

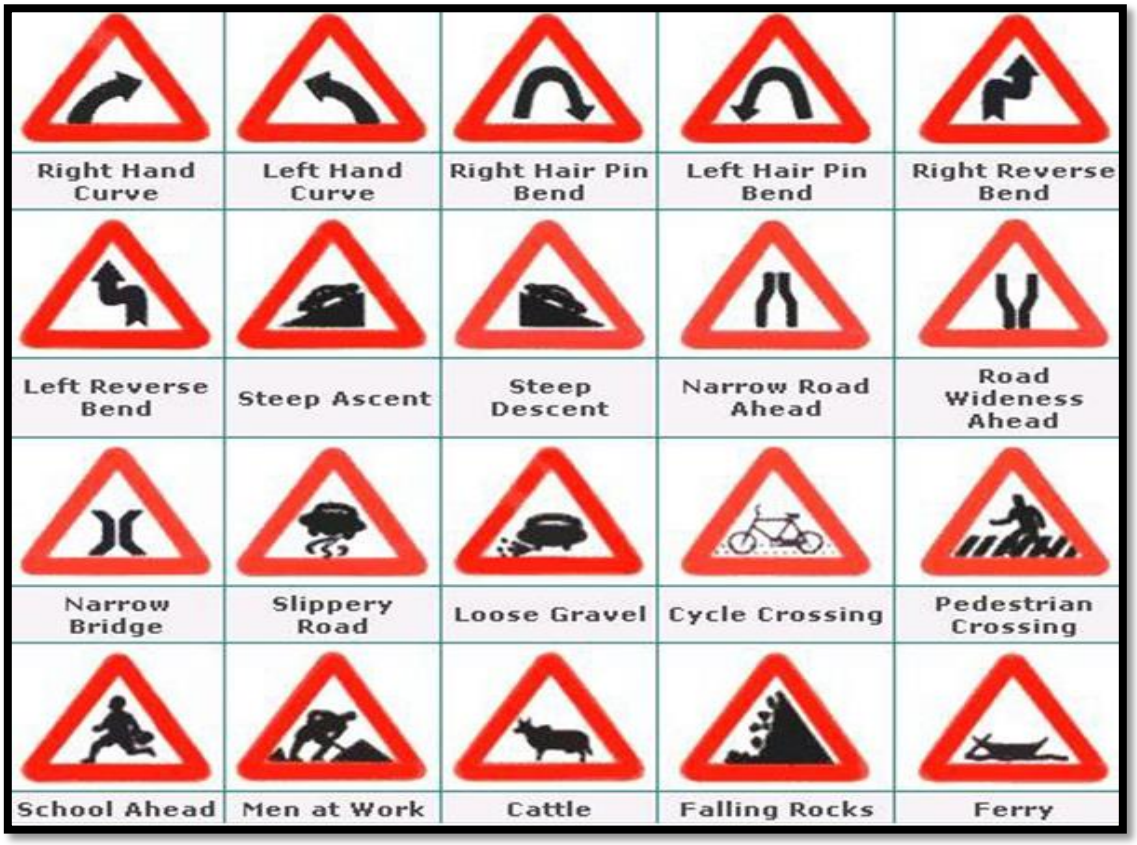

Fig. 3 Cautionary Signs

(Indian Traffic Rules and Signals)

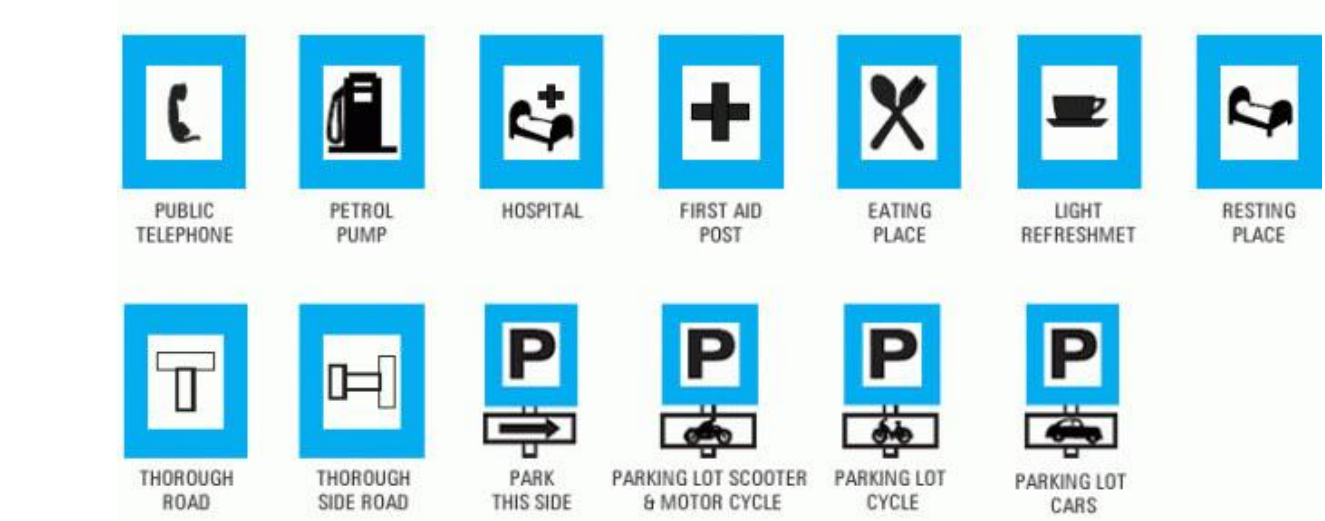

Fig. 4 Infomatary Signs

(Indian Traffic Rules and Signals)

1.4 ROAD SIGNS IN DEVELOPED COUNTRY

Until now, the use of acrylic light boxes in super-large signs has been impossible, essentially because of wind resistance and other external issues. Now, KMC (part of Lucite International in Taiwan) has led a project to successfully develop an ultra slim, extra large 5 m x 5 m traffic sign, based on an acrylic light box with an internal frame that is able to withstand winds up to scale 16 (51-56 m/sec). It has also developed a light homogenizing technique to overcome the uneven illumination problem commonly seen in traditional light boxes. It has taken two years since the initial concept and countless experiments involving a seamless adhesive method and calculated light arrangements to achieve the new traffic signs, which offer a number of advantages. For instance, when combined with a LED light source, the acrylic sheet can help overcome the problems of eye discomfort and fragmented characters associated with intercalated LED traffic signs. And with the addition of a solar panel, the traffic sign instantly becomes a zero carbon emissions, power-saving device. The signs also provide clear directions both day and night, greatly reducing drivers' 'eyes-off-the-road time', which can significantly improve road safety. In terms of installation and maintenance, its modular design makes the signs very easy to handle. (Lucite International- A Group Company of MITSUBISHI CHEMICAL)

Fig. 5 acrylic light box

(www.luciteinternational.com)

In the Netherlands, transport planner Hans Monderman has pioneered a new method which involves removing traffic signs, lights and in some cases, road markings. This concept has successfully been tested in the small Dutch town of Drachten, which has had traffic lights removed. Other changes included the installation of a children's playground in the middle of one of the roads to force drivers to slow down.

A number of European cities have begun to successfully implement the system developed by the Mondernmen, which reportedly has decreased congestion and reduced accidents, according to police statistics.

The German town of Bohmte have signed up for the new traffic concept from the Netherlands. The removal of road signs across Germany has been supported by the German transport ministry, where officials argue that the amount of signs is confusing drivers.

CHINA

(Article: Road signs in China)

- Warning signs in China are triangular with a black border, yellow background and black symbol.
- Mandatory signs generally follow European conventions (circular with red border/blue circle) with some local variations.

Direction signs are:

- Green for expressways
- Brown for tourist attractions
- And blue for other roads.
- Occasionally black on white is used for directions to local facilities.

Some of the signs used in china are shown in Fig. 6.

Fig. 6 Road Signs In China

NETHERLANDS

(Article: Road signs in the Netherlands)

Road signs in the Netherlands follow the Vienna Convention (1961). Directional signs (which have not been harmonized under the Convention) always use blue as the background colour. The destinations on the sign are printed in white. If the destination is not a town (but an area within town or some other kind of attraction), that destination will be printed in black on a separate white background within the otherwise blue sign.

The Netherlands always signposts European road numbers where applicable (i.e., on the advance directional signs, the interchange direction signs and on the reassurance signs). Dutch national road numbers are placed on a

rectangle, with motorways being signposted in white on a red rectangle (as an A*xx*) and primary roads in black on a yellow rectangle (as N*xx*). When a motorway changes to a primary road, its number remains the same, but the A is replaced by the N. So at a certain point the A2 becomes N2, and when it changes to a motorway again, it becomes A2 again. A series of signs is shown in Fig. 7.

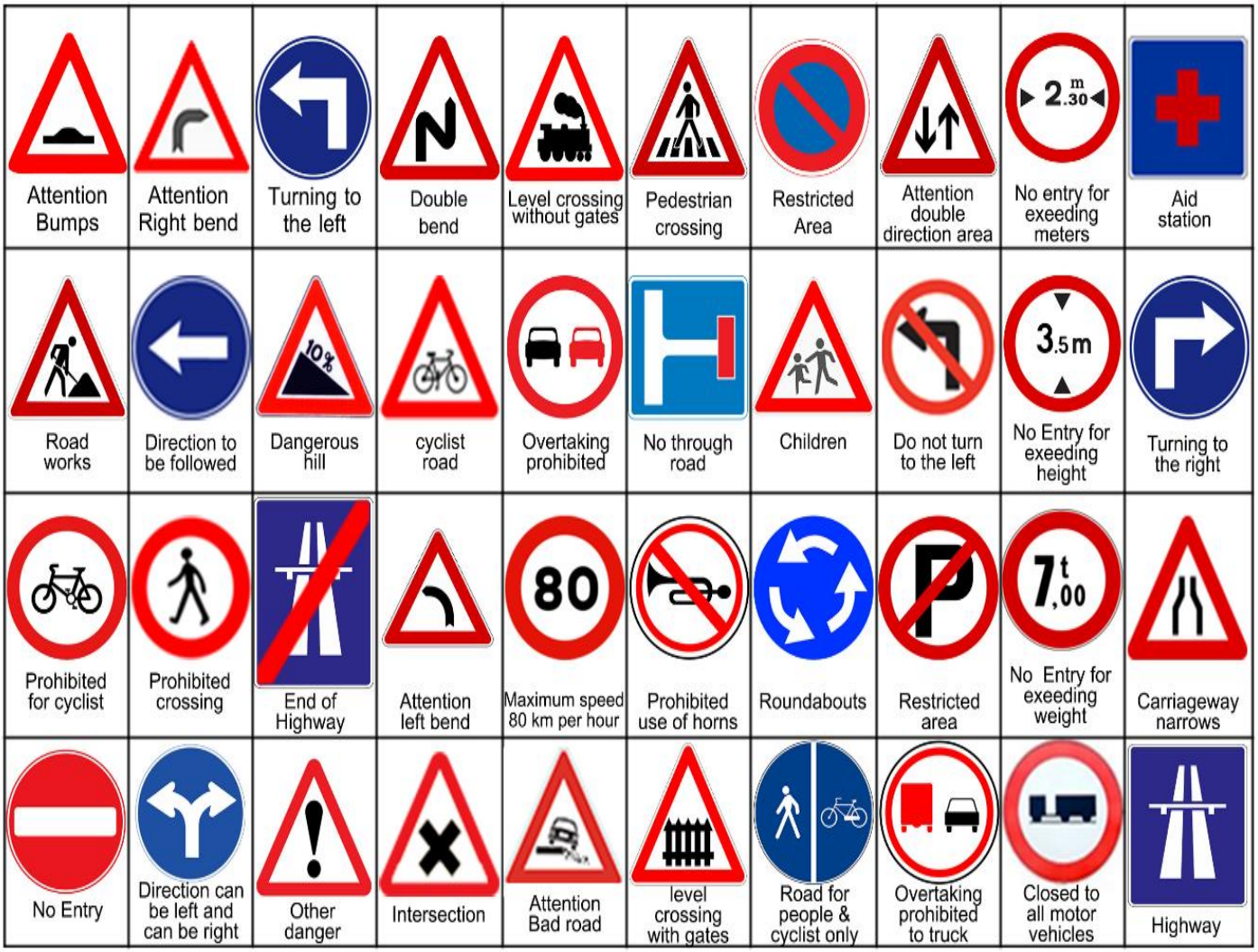

Fig. 7 Road Signs In Netherland

JAPAN

(Article: Road signs in Japan)

Road signs in Japan are either controlled by local police authorities under Road Traffic Law or by other road-controlling entities including Ministry of Land, Infrastructure, Transport and Tourism, local municipalities, NEXCO (companies controlling expressways), under Road Law. Most of the design of the road signs in Japan is similar to the signs on the Vienna Convention, except for some significant variances, such as stop sign with a red downward triangle. The main signs are categorized into four meaning types:

- Guidance (white characters on blue in general – on green in expressways),
- Warning (black characters and symbols on yellow diamond),
- Regulation (red or blue circle, depending on prohibition or regulation),
- And instruction (mostly white characters or symbols on blue square).

A sample of signs used in Japan is shown in Fig. 8.

Fig. 8 Road Signs In Japan

UNITED KINGDOM

(Article: Road signs in the United Kingdom)

Traffic signing in the UK conforms broadly to European norms, though a number of signs are unique to Britain and direction signs omit European route numbers. The current sign system, introduced on 1 January 1965, was developed in the late 1950s and early 1960s by the Anderson Committee, which established the motorway signing system, and by the Worboys Committee, which reformed signing for existing all-purpose roads.

The UK remains the only European Union member nation and the only Commonwealth country to use non-metric (Imperial) measurements for distance and speed, although "authorised weight" signs have been in metric tonnes since 1981 and there is currently a dual-unit (metric first) option for height and width restriction signage, intended for use on safety grounds. On motorways kilometre signs are visible at intervals of 500 metres (1,600 ft) indicating the distance from the start of the motorway.

Three colour schemes exist for direction signs:

- On motorways they are blue with white lettering
- On primary routes they are green with white lettering and yellow route numbers
- A non-primary route has white signs with black lettering
- A fourth colour scheme, black on yellow, is seen on temporary signs, for example marking a diversionary route avoiding a road closure.

Two typefaces are specified for British road signs. Transport "Medium" or Transport "Heavy" are used for all text on fixed permanent signs and most temporary signage, depending on the colour of the sign and associated text colour; dark text on a white background is normally set in "Heavy" so that it stands out better. However route numbers on motorway signs use a taller limited character set typeface called "Motorway".

All signs and their associated regulations can be found in the Traffic Signs Regulations and General Directions, as updated by the TSRGD 2008, TSRGD 2011 and TSRGD 2016 and complemented by the various chapters of the "Traffic Signs Manual".

Some of the commonly used signs in UK are given in Fig. 9.

Fig. 9 Road Signs In UK

ROAD MARKINGS IN INDIA

Types of Road Markings

- Carriageway Road Markings
- Longitudinal Markings
- Intersection Markings
- Hazardous Location Markings
- Parking
- Word Messages
- Object Markings

Colours employed

- White: Generally to all markings
- Yellow: No overtaking zones Obstructions to Approaches Parking restrictions
- Black: Alternate with white for kerb markings

Materials

- Thermo plastic paints
- Reflectorized paint
- Prefabricated sheets

Longitudinal Marking

- Centre Line Marking

- Traffic Lane Markings
- Border or Edge lines
- Warning Lines
- No Passing Zones
- Bus Lane Markings

Longitudinal pavement markings are lines placed along the direction of traffic to indicate a driver, his proper position on the roadway.

- Centre Line Markings: They are either continuous or broken lines dividing road into two equal halves. They indicate that the traffic of one side should not move onto the another side (except in case of broken line).

- Traffic Lane Markings:Lane markings are usually broken lines white in colour dividing the road into lanes, each of 3.5 metres.

- Border or Edge Lines: These are drawn at the road shoulders with solid lines usually in white or yellow colours. They indicate the edge of the road carriageway.

- Bus Lane Markings: The right most lanes on the carriageway is allotted for heavy vehicles such as Buses, Trucks, etc.

Centre line marking for two lane road

On roads with less than four lanes or on those roads having four lanes and on which parking is permitted thus reducing the operational width, the centre lines shall consist of single broken line 150mm wide of 3 m long segments with 4.5 m gaps. On curves and approaches to intersections, the gap shall be 3 meters as shown in Fig. 10. The colour of the centre line shall be yellow.

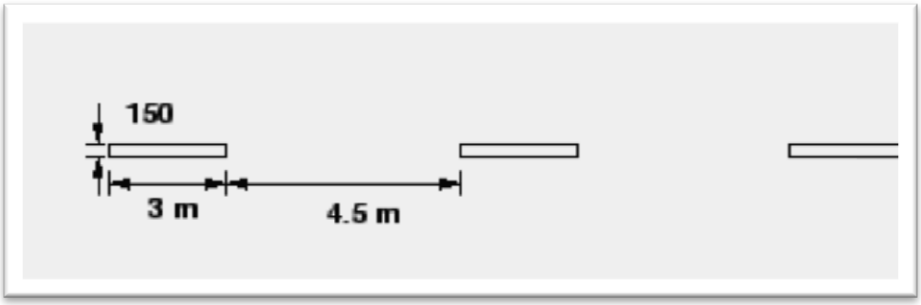

Fig. 10 Centre line marking for a two lane road

(IRC 35-1997 Code of Practice for Road Markings)

Centre line marking for four lane road

On undivided roads with at least two traffic lanes in each direction, the centre line marking shall consist of a single solid continuous line of 150 mm wide with lane markings of 1.5m segments and 3 m gaps as shown in Fig. 11. and gaps on curved reaches and approaches intersection shall be 1.5 m long. The colour of the centre line shall be yellow.

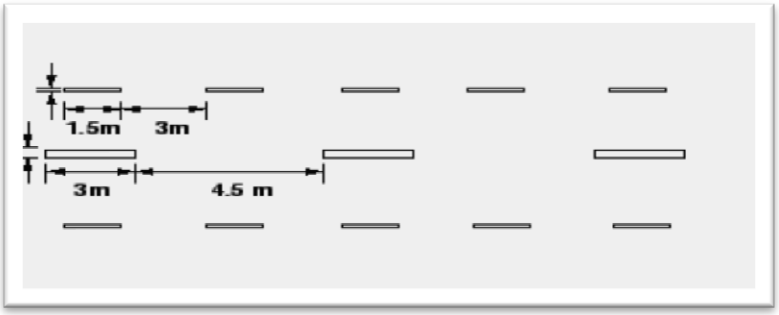

Fig. 11 Centre line and lane marking for a four lane road

(IRC 35-1997 Code of Practice for Road Markings)

Centre line marking for six lane road

On undivided roads with at least three traffic lanes in each direction, the centre line marking shall consist of a double solid continuous line of 150 mm wide separated by a space of 100 mm with lane markings of 1.5 m and 3 m gaps as shown in Fig. 12 and gaps on curved reaches and approaches to intersection shall be 1.5 m long. The colour of the centre line shall be yellow.

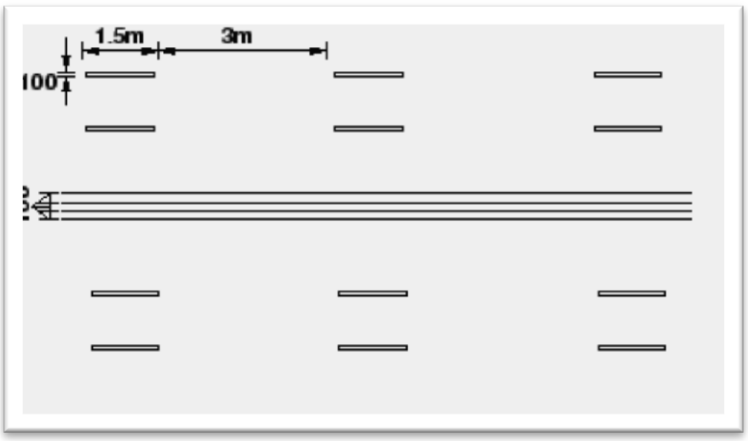

Fig. 12 Double solid line for a two lane road

(IRC 35-1997 Code of Practice for Road Markings)

Stop line indicates the position beyond which the vehicles should not proceed when required to stop by traffic police, traffic signals or other traffic control devices. Stop lines should either be parallel.

WARNING LINE MARKINGS

Warning lines are broken lines with segments and gaps of same length. These are marked on horizontal curves and vertical curves to make drivers more cautious. Warning lines can also be used at other hazardous locations such as approaches to intersections, obstruction approaches and sharp curves etc. Warning lines are always single lines with a minimum of 7 segments at any location. Width of warning line is same as a centre line or traffic lane line immediately preceding it.

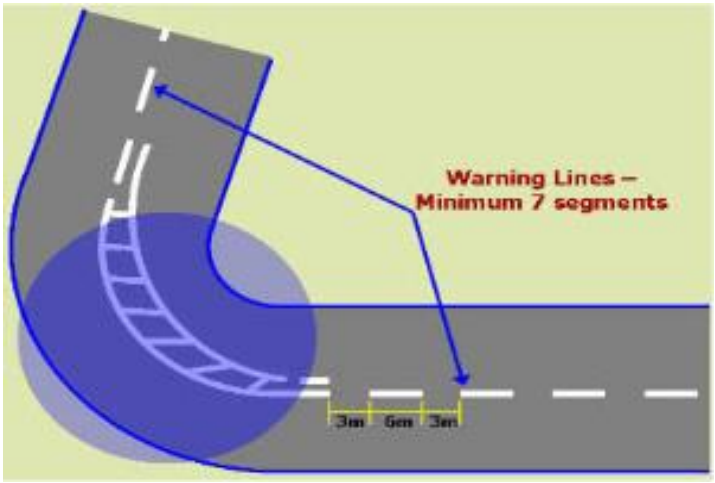

Fig. 13 Warning Line Marking

(http://www.ctp.gov.in/RoadMarkings.htm)

INTERSECION MARKING

STOP LINE MARKINGS

Two patterns are normally prescribed namely Single Stop Line or Double Stop Line. Single stop line shall be solid white transverse line of 200 mm wide on urban roads and 300 mm wide on rural roads to the intersecting roadway or at right angles to the approaching vehicle.

Double stop lines shall consist of two continuous lines of each 200 mm width spaced 300 mm apart and supplemented by a STOP SIGN and a word message STOP on the carriageway. The single stop line shall ordinarily be located not less than 2 meters nor more than 3 meters in advance and parallel to the nearest boundary of the pedestrian crossing marking. Where there is no pedestrian crossing, the single line shall be placed not less than 1.25 meters and not more than 9 meters from the nearest carriageway edge of the intersecting road. The double line is used exclusively at junctions controlled by STOP signs and in no circumstances should be used merely to give warning of the approach to a major road, for which purpose GIVE WAY marking is appropriate.

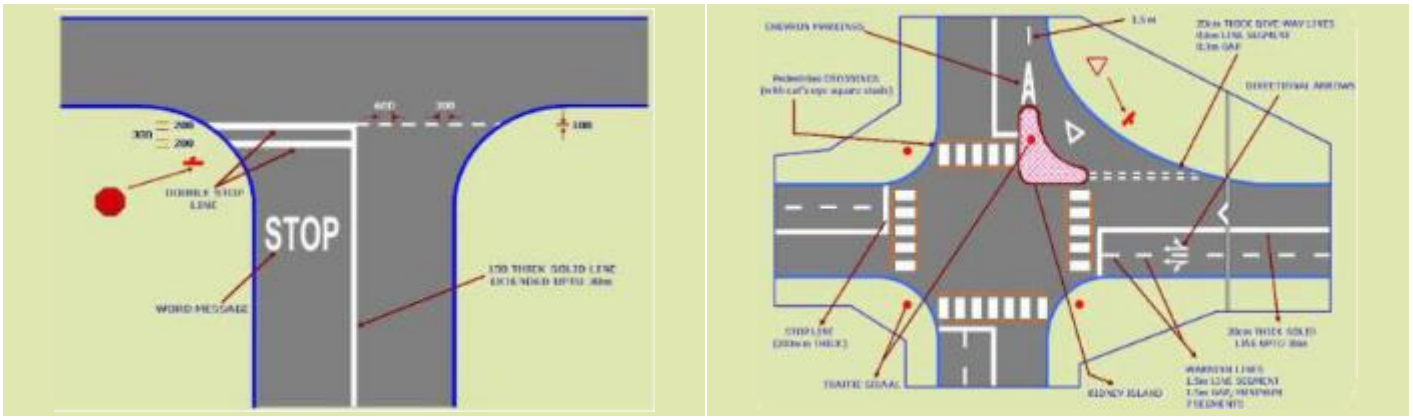

Fig. 14 Stop Line Marking

(http://www.ctp.gov.in/RoadMarkings.htm)

PEDESTRIAN CROSSINGS

Crossing of the carriage way by Pedestrians only at the authorised places minimises confusion and improves safety. The Pedestrian crossings shall be provided at important intersections where conflict exists between vehicular traffic and pedestrian movements. The site should be so selected that the pedestrians are subjected to minimum inconvenience and the vehicular traffic is not interrupted very often.

The location of pedestrian crossing at an intersection should fulfil the following conditions to ensure safety:
Adequate visibility so that the driver of approaching vehicle has clear view of the persons on the pedestrian crossing and on the foot path. Sufficient space is available on the foot path for pedestrians to wait. Freedom from obstructions such as trees, sign posts, lamp posts etc. in the path of pedestrians at either end.

PEDESTRIAN CROSSING AT AN INTERSECTION

At intersections, the pedestrian crossings should invariably be preceded by a STOP line at a distance of 2 to 3 m for unsignalised intersection and at 1 m for signalised intersection. The width of the pedestrian crossing is governed by the pedestrian volumes crossing the road and by local requirements and in no case it shall be less than the width of foot path subject to a minimum of 1.5 m. The width of the crossing generally lies between 2 m to 4 m. Marking for Pedestrian crossing mostly used is the Zebra Pattern consisting of equally spaced white stripes generally 500 mm wide in accordance with IRC:103 – 1988. A warning sign to indicate that the pedestrian crossing is ahead should also be installed. At mid-block pedestrian crossing in urban areas, it may be advantageous to install flashing signals along with markings.

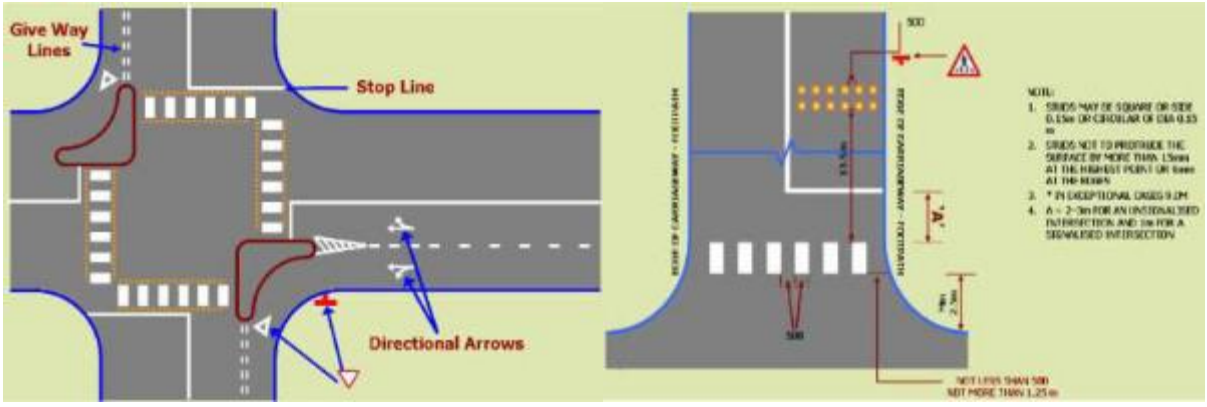

Fig. 15 Markings for Pedestrian Crossing

(http://www.ctp.gov.in/RoadMarkings.htm)

ROAD MARKINGS IN UNITED KINGDOM

In England, the idea of painting a centre white line was first experimented in 1921 in Sutton Coldfield, Birmingham. Following complaints by residents over reckless driving and several collisions, the Sutton Coldfield Corporation decided to paint the line on Maney Corner in the area of Maney. In 1971, a correspondent for the Sutton Coldfield, News wrote an article in the newspaper recalling the event.

The line was put down as an experiment as there were a lot of accidents there, even in the early days of the motor car. The experiment proved to be so successful that the whole country adopted it as a standard road safety device, and later foreign countries paint lines on their roads, as well.

During the World War II the Pedestrians Association lobbied for the government to make it safer for pedestrians to walk during the black out. As a result, white lines were painted on the sides of the road and pedestrians were allowed to use a small torch.

In the UK, the first "white line" road markings appeared on a number of dangerous bends on the London-Folkestone road at Ashford, Kent, in 1914, and during the 1920s the rise of painted lines on UK roads grew dramatically. In 1926 official guidelines were issued by the Ministry of Transport that defined where and how white lines on roads should be used. A broken white line in the direction of travel, where the gaps are longer than the painted lines, indicates the centre of the road and that there are no hazards specific to the design and layout of the road, i.e. no turnings, sharp bends ahead etc. A broken white line in which the gaps are shorter than the painted lines indicates an upcoming hazard, the proportion of white to black indicates the degree of hazard i.e. more white means more hazard.

The Ministry of Transport experimented with double-line road markings for the first time on sections of the A20 and A3 during Easter in 1957. The markings were cautionary, and had no legal status at that time, but motorists were advised that ignoring them could weigh heavily against someone involved in an accident in their vicinity. Further, "it is in order, if safe to do so, to cross the lines only when the broken one is on your side. It is not in order to cross when the solid line is on your side or to park there."

A double solid white line indicates that the line may not be crossed, overtaking is permitted if it can be performed safely without crossing the line. Solid lines can be crossed in certain specific conditions (entering premises, overtaking a stationary vehicle, overtaking a vehicle, pedal cycle or horse travelling at less than 10 mph, or when directed to do so by a police officer). A solid white line with a broken white line parallel to it indicates that crossing the line is allowed for traffic in one direction (the side closest to the broken line) and not the other.

Solid white lines are also used to mark the outer edges of a road.

A double yellow line (commonly known as just a "Double Yellow") next to the kerb means that no parking is allowed at any time, whilst a single yellow line is used in conjunction with signs to denote that parking is restricted at certain times. Double and single red lines mean that stopping is not allowed at any time or between certain times respectively.

On many roads in the UK, retro-reflective road studs, including those known as "cat's eyes" when referring to the Halifax type road stud, are placed in the road. These devices reflect the light from a car's headlights back towards the driver in order to highlight features of the road in poor visibility or at night. The colour of road studs differs according to their location. Those defining the division between lanes are white, red road studs are placed along the hard shoulder of motorways, dual carriageways and other roads to mark the left-hand edge of a running lane; and orange road studs are placed along the edge of the central reservation. Green road studs denote slip roads at grade-separated junctions and also road-side lay-bys.

Comprehensive information about highway markings in the UK can be found in the Highway Code and on the gov.uk website

In the UK, there are many roadway lines that drivers need to pay attention to while traveling in their cars:

- **Broken white centre line:** this dashed line down the centre of the carriageway divides traffic travelling in opposite directions. The dashes and the gaps between them are roughly the same size.
- **Broken white lane line:** this dashed line divides the lanes of traffic traveling in the same direction. The dashes are shorter and the gaps between them are longer than the centre line.
- **Broken white hazard warning line:** this dashed line warns drivers of an upcoming hazard such as the approach to a junction or a bend in the road. The dashes are longer than the ones used for the centre line and the gaps are much smaller between them.
- **Double solid white lines:** these lines are not to be crossed unless the driver is turning into a side road or property. They can also be crossed if the driver is trying to pass around a cyclist, horseback rider, or road work vehicle.
- **Single solid white line:** this line is painted on the left sides of the carriageway. They usually exist on private driveways and lay-bys.
- **Double solid yellow lines:** these lines show drivers where there is absolutely no waiting at any time.
- **Single solid yellow line:** this line shows drivers that there are part-time parking restrictions enforced in the area.
- **Double and single red lines:** these lines show drivers that there are stopping, loading, and parking restrictions enforced in the area.
- **Yellow zigzagged lines:** these lines are generally used to mark police and fire stations, schools, and hospitals. Generally speaking, there is no parking in these areas.

There are a number of road markings in the UK that drivers need to be aware of when using the roads. Here are some of the most common:

- **Triangular give way markings**: they are found before junctions in the road and represent “give way”. Drivers need to yield to cross traffic.
- **Stop markings**: in addition to a white line that stops traffic, the word “stop” can also be found on the roadways to mark the location where cars need to stop for cross traffic. By law, drivers must come to a full and complete stop whether or not they see cars approaching.
- **Hatched markings**: diagonal hatched markings are used on the roadway to show drivers where opposing traffic is separated. These hatched markings are usually bordered with a solid or dashed line. These areas can also be used to show lane additions and reductions as the carriageways progress.
- **Chevron markings**: the chevron shape is used to show drivers where the lane is divided into two. They can be used to divide two lanes of traffic flowing in the same or opposite directions.
- **Directional arrow markings**: the carriageways are filled with directional arrows to show drivers which way traffic is flowing. These are keys to safety, preventing cars from travelling the wrong way in traffic.
- **Cycle markings**: lanes and boxes are marked for cyclists. These are important to keep distance between cyclists and drivers and provide safety to all.
- **Keep clear markings**: There are “keep clear” boxes in the carriageways to mark areas where cars are not allowed to idle. These areas are usually in junctions where it is crucial for traffic to pass in case of emergencies. These tend to also help increase smooth traffic flow and prevent congestion and gridlock. Sometimes, areas that need to be kept clear are also marked with a yellow, criss-crossed set of lines within a solid yellow border.

(a) (b)

(c) (d)

Fig. 16

(https://www.riggott.co.uk/the-importance-of-road-markings/)

CONCLUSIONS

In other developing countries road signs are briefly classified like tourist signs, additional signs, vehicle mounted signs, retired signs at which are not used in India. As Netherlands adopts removal of a traffic signs and with proved success, we can test and adopt it. Guidelines for the road marking and traffic signs need to improvise for effective management of traffic flow.

The country like China direction signs are of different colour like Green for expressway, Brown for tourist attraction and Blue for other roads and occasionally Black on White is used for directions to local facilities.

In Netherland, background colour of directional signs is Blue. The destinations on the sign are printed in White. If the destination is not a town that destination will be printed in Black on a separate White background in the Blue sign.

In Japan, Guidance is shown in white characters on blue in general and on green in expressways, Warning is shown in black characters and symbols on yellow diamond, Regulation is shown in red or blue circle, depending on prohibition or regulation and instruction mostly white characters or symbols on blue square.

In UK, On motorways they are blue with white lettering, On primary routes they are green with white lettering and yellow route numbers, A non-primary route has white signs with black lettering, A fourth colour scheme, black on yellow, is seen on temporary signs, for example marking a diversionary route avoiding a road closure.

Warning traffic sign are usually in shape of an equilateral triangle with a White background and Red thick border. In Sweden, Serbia, Bosnia and Herzegovina, Greece, Finland, Iceland, the Republic of Macadamia and Poland they have Red border with an Amber background. Some warning signs have flashing lights to alert driver of conditions ahead or remind to slow down. In Britain they are called warning light.

The current situation of road safety signs, symbols and road markings are insufficient in most areas in terms of pedestrian safety. When it comes to adjacent highway the situation aggravates. Many zebra-crossings are found on the roadways but the physical condition and visibility of them are very poor due to poor or no markings at all. The situation

fails the attention of the motor driver for safer pedestrian crossing. In order to minimize delay the motor driver have tendency to cross the junction quickly. The overall safety requirements are inadequate in terms of public safety in planned residential neighbourhood and the adjacent highways. There are many scopes for road and neighbourhood environment to improve in terms of safety signs, symbols and road markings reduce the possibilities of pedestrian accidents. If proper steps are not taken with a view to the safety of pedestrians and also for the drivers road accidents would be unfortunate outcome.

New regulatory road signs must be design using ergonomics principles of design. Ergonomic concept in comprehension plays an important role in the improvement of road design.

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