

B.Sc - Road & Railway Design I.

Lecture 6.



ROAD SIGNS, SIGNALS & PAVEMENT MARKINGS

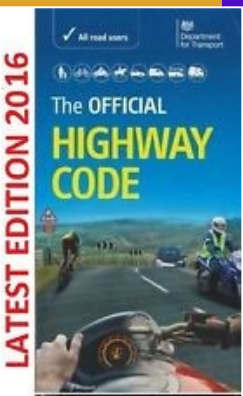
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Pécs, 2019

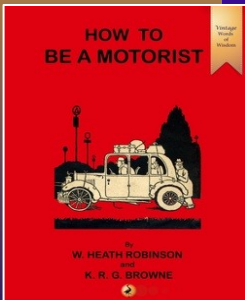
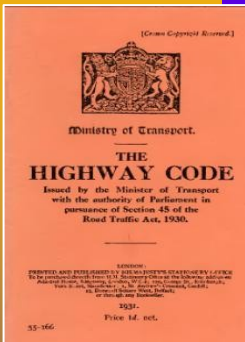
TRAFFIC SIGNS

- ❖ Traffic signs are devices placed along, beside, or above a roadway to guide, warn and regulate the traffic (motor vehicles, bicycles and pedestrians)
- ❖ They serve 3 different purposes:
 - ❖ Regulate traffic, movement or parking
 - ❖ To warn of potential dangers or changes in road and/or traffic condition
 - ❖ To provide information and guidance
- ❖ They are explained in the Road/Highway Code of each country
- ❖ Traffic signs have shapes that denote specific meaning, allowing to know if you are faced any of the purposes enumerated above



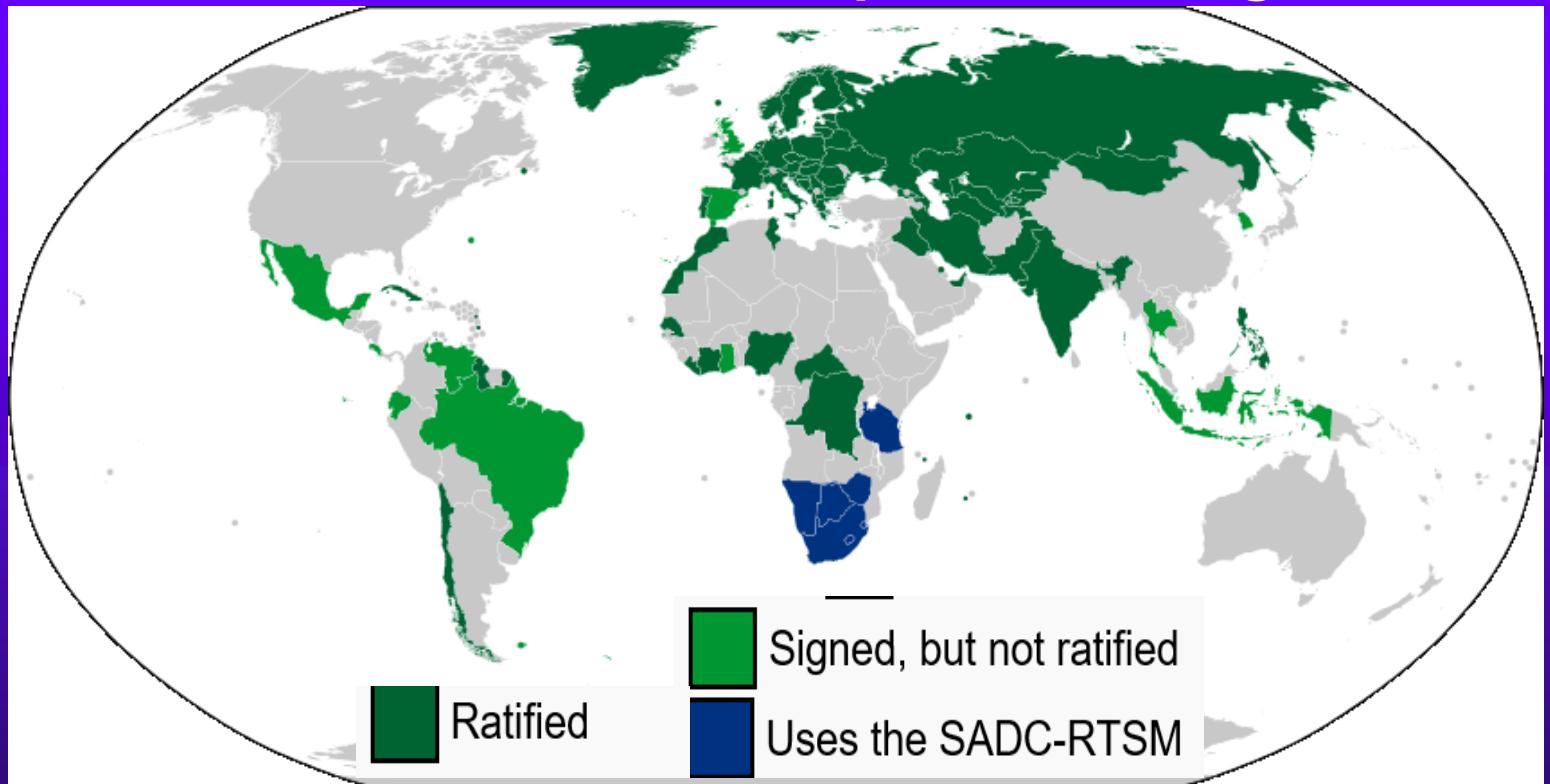
THE VIENNA CONVENTION 1

- ❖ The Convention on Road Signs and Signals, agreed upon by the UN Economic and Social Council in 1968 (the *Vienna Convention*), is a multilateral treaty designed to increase road safety and assist drivers by standardising the signing system for road traffic
- ❖ The convention revised and substantially extended the earlier 1949 Geneva Protocol on Road Signs and Signals
- ❖ Although it has been signed by 35 States, most jurisdictions outside Europe have not adopted either treaty and maintain their own systems of road traffic signs, road markings and signals



THE VIENNA CONVENTION 2

The Convention has 65 state parties at August 2016



A competing convention called the SADC-RTSM, is used by 7 countries in southern Africa; it follows many of the similar rules and principles as in the Vienna Convention



CLASSIFICATION OF SIGNS

❖ **The Convention classes all road signs as follows:**

A - Danger warning signs

B - Priority signs

C - Prohibitory or restrictive signs

D - Mandatory signs

F - Information, facilities, or service signs

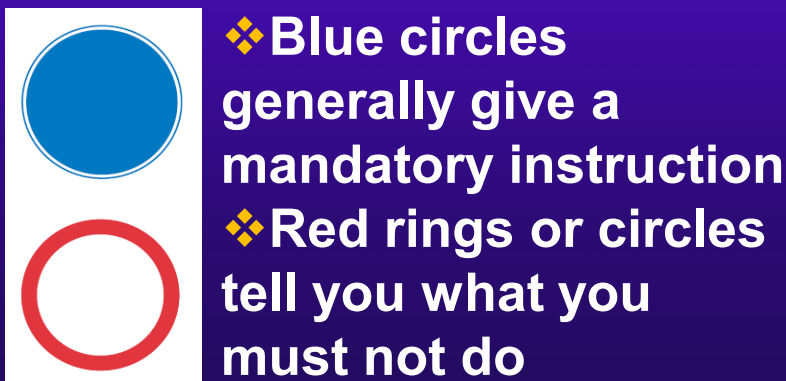
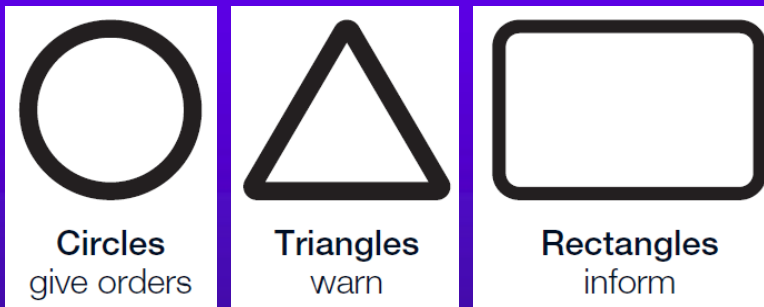
G - Direction, position or indication signs

H - Additional panels

❖ **The convention lays out precise colours, sizes and shapes for each of these signs**

SHAPE AND COLOUR OF ROAD SIGNS

- ❖ There are three basic types of traffic sign: signs that give orders, signs that warn and signs that give information - each type has a different shape:



- ❖ There are a few exceptions to the shape and colour rules, to give certain signs greater prominence.

DANGER WARNING SIGNS

Class of sign	Shape	Ground	Border	Size	Symbol	Examples
Danger warning sign	Equilateral triangle	White or yellow	Red	0.9 m (large), 0.6 m (small)	Black or dark blue	
	Diamond	Yellow	Black	0.6 m (large), 0.4 m (small)	Black or dark blue	



PRIORITY SIGNS

1

Class of sign	Shape	Ground	Border	Size	Symbol	Examples
Yield sign	Inverted equilateral triangle	White or yellow	Red	0.9 m (large), 0.6 m (small)	None	
Stop sign	Octagon	Red	White	0.9 m (large), 0.6 m (small)	Stop [†] written in white	
	Circular	White or yellow	Red	0.9 m (large), 0.6 m (small)	Stop [†] written in blue or black inside red inverted triangle	

PRIORITY SIGNS

2

Class of sign	Shape	Ground	Border	Size	Symbol	Examples
Priority road	Diamond	White	Black	0.5 m (large), 0.35 m (small)	Yellow square	
End priority	Diamond	White	Black	0.5 m (large), 0.35 m (small)	Yellow square and grey or black diagonal lines crossing the sign	

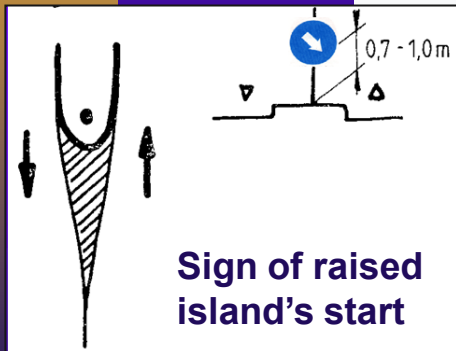
PRIORITY SIGNS

3



Class of sign	Shape	Ground	Border	Size	Symbol	Examples
Priority for oncoming traffic	Circular	White or yellow	Red	Unspecified	Black arrow indicating direction with priority, red arrow indicating direction without	
Priority over oncoming traffic	Rectangle	Blue	None	Unspecified	White arrow indicating direction with priority, red arrow indicating direction without	

MANDATORY SIGNS



Class of sign	Shape	Ground	Border	Size	Symbol	Examples
Mandatory signs						
Standard mandatory	Circular	Blue	None	0.6 m (large), 0.4 m (small), 0.3 m (very small)	Varies, white	
	Circular	White	Red	0.6 m (large), 0.4 m (small), 0.3 m (very small)	Varies, black	

PROHIBITORY SIGNS

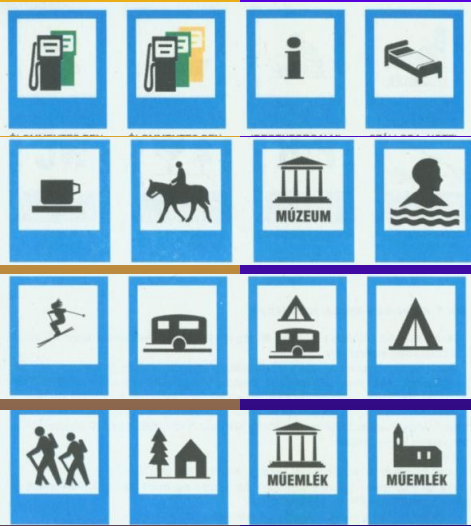
Class of sign	Shape	Ground	Border	Size	Symbol	Examples
Standard prohibitory	Circular	White or yellow	Red	0.6 m (large), 0.4 m (small)	Varies	
Parking prohibitory	Circular	Blue	Red	0.6 m (large), 0.2 m (small)	Varies	
End of prohibition	Circular	White or yellow	None	0.6 m (large), 0.4 m (small)	Black, blue or grey diagonal line	




SPECIAL REGULATION & INFORMATION SIGNS



Class of sign	Shape	Ground	Border	Size	Symbol	Examples
Special regulation signs						
All signs	Rectangular	Blue	Unspecified	Unspecified	Varies, white	
		Light	Unspecified	Unspecified	Varies, Black	
Information, facilities or service signs						
All signs	Unspecified	Blue or green	Unspecified	Unspecified	Varies, on white or yellow rectangle	



INDICATION SIGNS

Class of sign	Shape	Ground	Border	Size	Symbol	Examples
Direction, position or indication signs						
Informative signs	Rectangular, sometimes with arrowhead	Light	Unspecified	Unspecified	Varies, dark	 
		Dark	Unspecified	Unspecified	Varies, light	
Motorways	Rectangular	Blue or green	Unspecified	Unspecified	Varies, white	 
Temporary	Rectangular	Yellow or orange	Unspecified	Unspecified	Varies, black	

FUNNY ROAD SIGNS



WHERE TO PLACE ROAD SIGNS

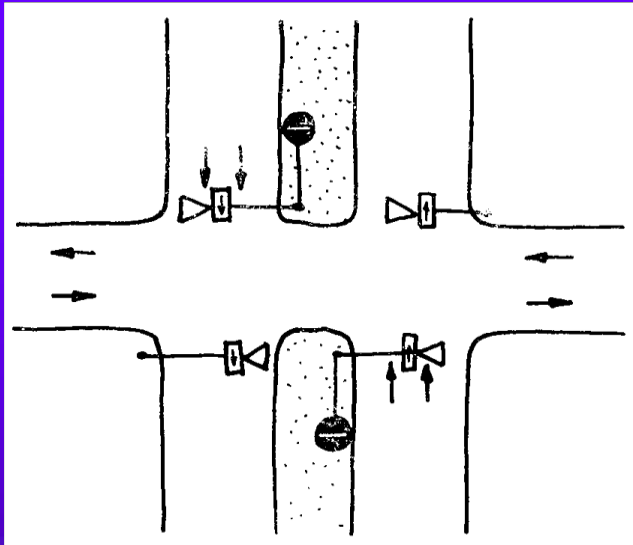
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- ❖ Road signs shall be placed generally on the right side of the roadway, but might be repeated on the opposite side and/or above the minimum clearance outline (4.5 m) as well
- ❖ Preliminary signs indicating distance to run up to the real sign itself, are to be placed below to the sign
- ❖ More than 3 signs should not be mounted on the same signpost
- ❖ Prohibitory signs shall be enhanced also by appropriate road markings (e. g. „*passing prohibited*” sign by *solid centerlane*)

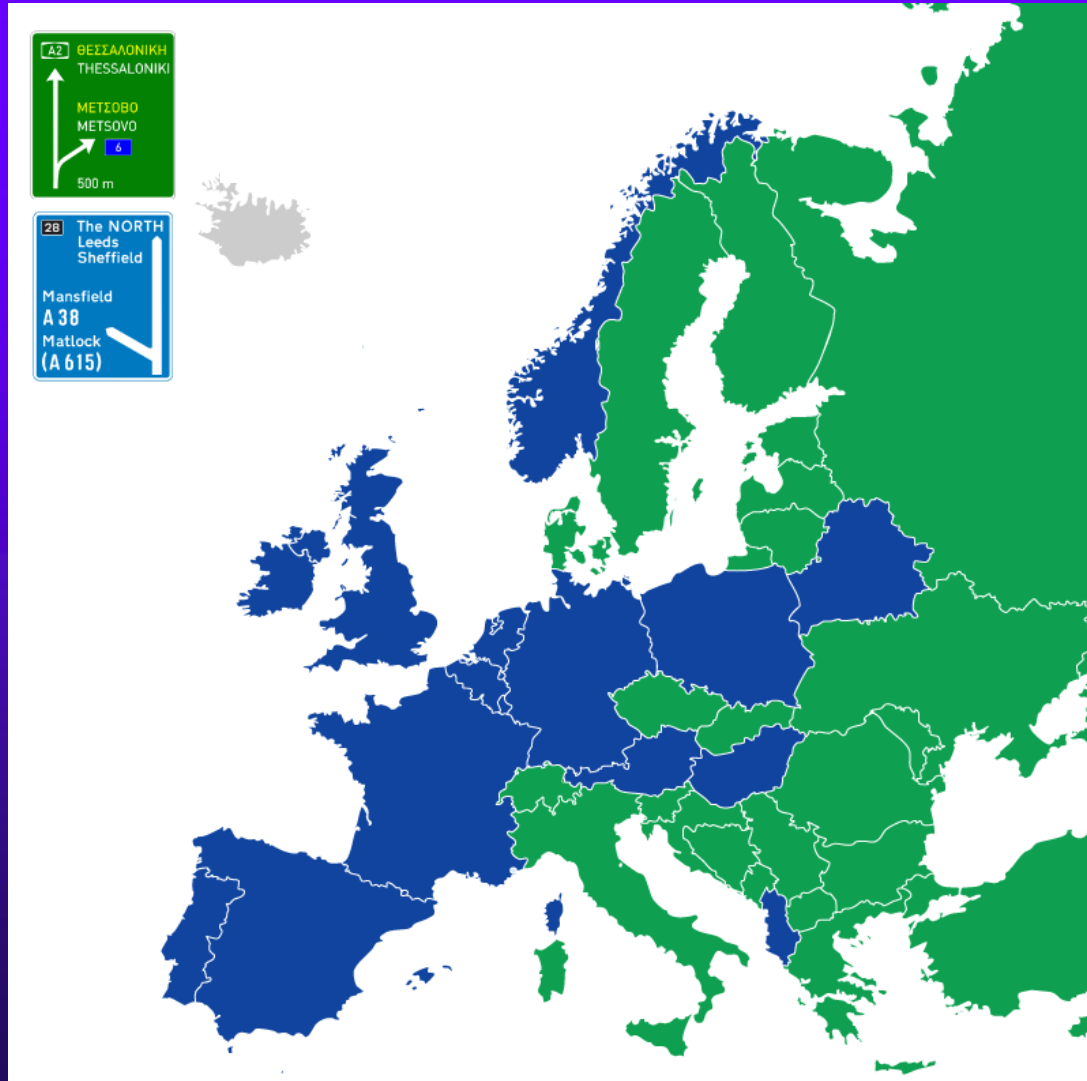


WHERE TO PLACE ROAD SIGNS

2



COLOURS OF MOTORWAY SIGNS IN EUROPE



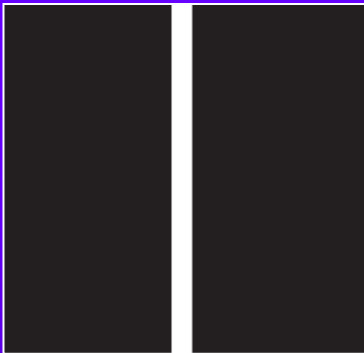
ROAD MARKINGS

1

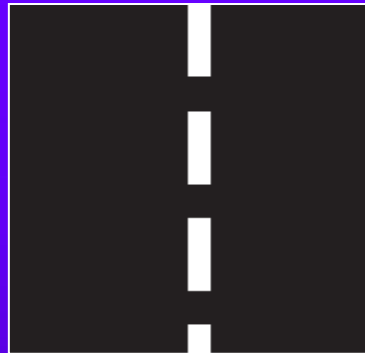
- ❖ The convention also specifies road markings: they shall be white or yellow, less than 6 mm high, with cat's eye reflectors no more than 15 mm above the road surface
- ❖ The length and width of markings varies according to purpose, although no exact figures for size are stated; roads in built up areas should use a broken line for lane division, while solid lines must only be used in special cases, such as reduced visibility or narrowed carriageways
- ❖ All words painted on the road surface should be either of place names, or of words recognisable in most languages, such as "Stop" or "Taxi"

ROAD MARKINGS

2



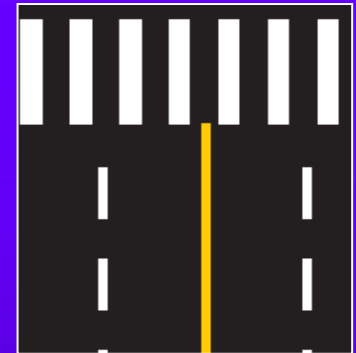
Single solid line - do not change lanes



Broken line - lane changing is allowed when safe



Stop line - stop before this line



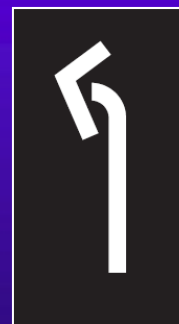
Pedestrian crosswalk - stop for pedestrians in the crosswalk



Broken line and solid line - you may pass only when it is safe and the broken line is on your side



Double solid line - no passing allowed



Vehicles in this lane must turn left



Vehicles in this lane must go straight or turn left



Painted island - keep to the right and do not drive on or over

ROAD MARKINGS

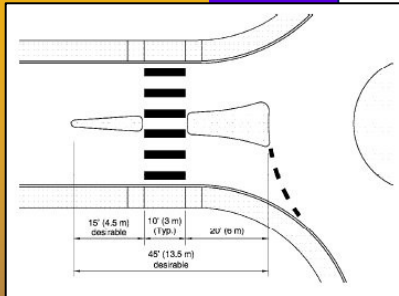
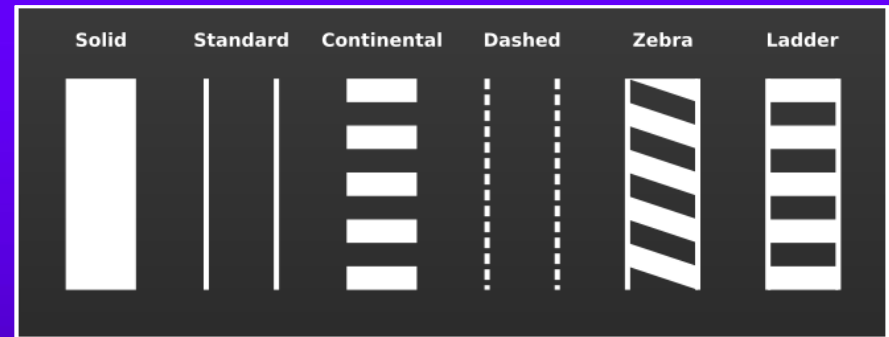
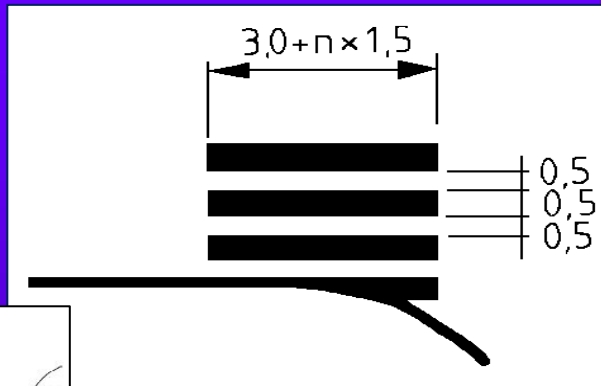
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- ❖ Width of lines varies between 0.05-0.25 m
- ❖ Length of *broken lines* marking
 - ❖ on expressways and motorways: 9-9 m
 - ❖ on main roads: 6-6 m
 - ❖ on secondary roads: 3-3 m
 - ❖ at intersections: 1,5-1,5 m
- ❖ Role of *broken lines* marking:
 - ❖ *centerline* (provided the pavement's width is 5.5 meter, or more and passing is allowed)
 - ❖ *borderline* of (parallel) traffic lanes
 - ❖ *outer borderline* of curved traffic lane serving left turning vehicles at intersections

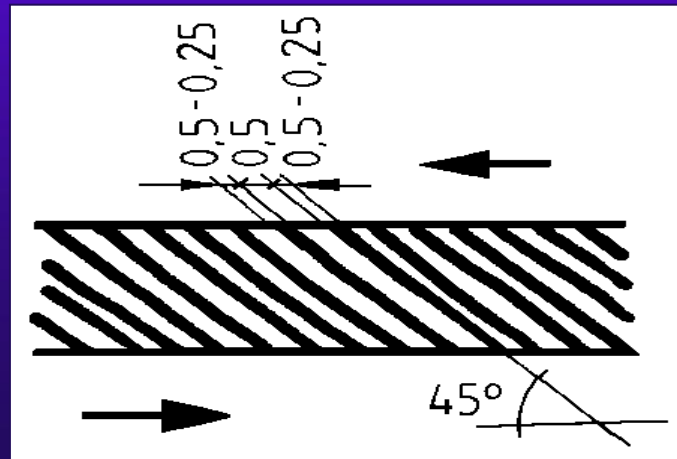
ROAD MARKINGS

4

❖ Pedestrian crosswalk (n is an integer) :



❖ Painted island:



SAFETY & COMFORT DEVICES

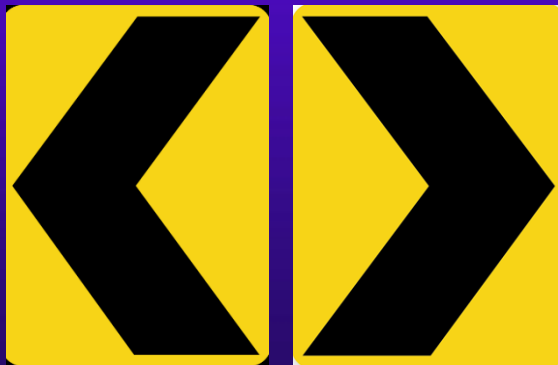
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❖ Devices safeguarding pedestrians

- guardrails and fences
- flower containers

❖ Devices related to traffic of motor vehicles

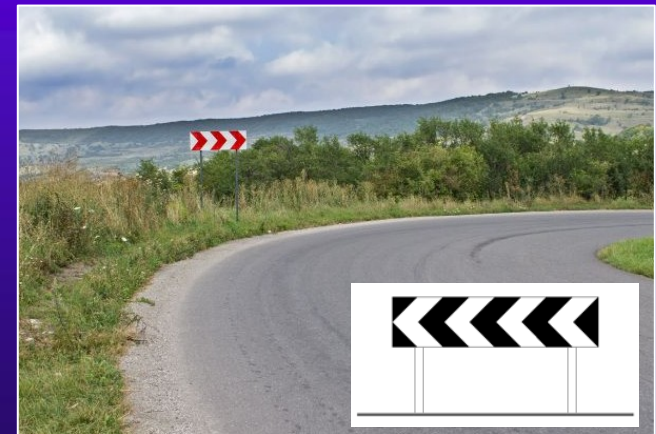
- safety barriers
- warn signs of dangerous curves
- markers for objects causing potential traffic troubles
- distance signs
- public lighting



Alignment Symbols (left/right)



Object Markers



Alignment Symbol: dangerous curve

SAFETY & COMFORT DEVICES

2

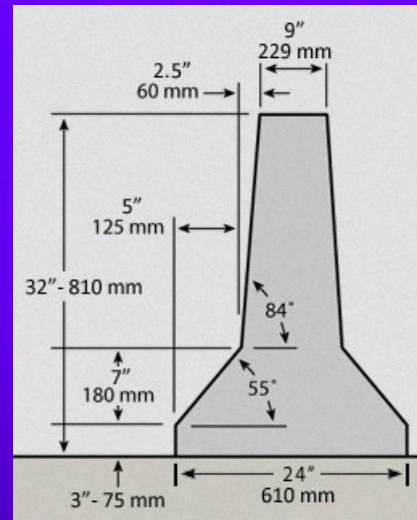


Metal Safety Barriers



Public Lighting

CONCRETE & TEMPORARY SAFETY BARRIERS



SAFETY & COMFORT DEVICES

3



Safety barrier; sign of roundabout; distance sign for ambulance helicopters and preliminary sign of end of expressway

Shoulder-edge markers with fluorescent prism (right: red; opposite side: white) and distance sign (km section from start of road)









NOISE BARRIER WALLS



TRAFFIC LIGHTS

❖ The Convention specifies the colours for traffic lights and their meanings, places and purposes lights may be used for

Shape	Colour	Position	Meaning
Plain	 Green	At intersection	Proceed
	 Amber	At intersection, level crossing, swing bridge, airport, fire station or ferry terminal	Stop if possible
	 Red	At intersection	Stop
	 Red and amber	At intersection	Signal is about to change (usually to green)
Arrow pointing left	Green	At intersection	Only traffic turning left may proceed
Arrow pointing right	Green	At intersection	Only traffic turning right may proceed
Arrow pointing upwards	Green	At intersection	Only traffic travelling straight ahead may proceed
Arrow pointing downwards	 Green	Above lane	Traffic may continue in lane
Cross (x)	 Red	Above lane	Traffic may not enter lane (lane closed)



TRAFFIC LIGHT CONTROL AND COORDINATION

1

❖ Basic configurations:

- ❖ *Fixed time control* - once for all programmed traffic lights
- ❖ *Dynamic control* - the controller processor uses input from *detectors*, (sensors) that inform it, whether vehicles or other road users are present, to adjust signal timing and phasing within the limits set by the controller's programming)
- ❖ *Coordinated control* - traffic signals on a coordinated system are programmed so that drivers encounter a green wave, a long string of green lights (the technical term is *progression*)
- ❖ *Systemic control* - traffic lights are centrally controlled by monitors or by computers to allow them to be coordinated in real time to deal with changing traffic patterns

TRAFFIC LIGHT CONTROL AND COORDINATION

2

