



SIGNS, MARKINGS & DELINEATION

Topics in this presentation:

- Types of road signs
- Signing principles – the 6 C's
- Placement of signs
- Delineation
- Pavement markings



Signs assist road users with their decision making (to make correct decisions, quicker)

Use

Use standard applications

- Follow your country's standards
- But always question whether "standards" are safe
- Judgment

Be

Be consistent across the road network

- Consistent use of signs and symbols
- Consistent level of signage: not too little or too much

Put

Put yourself in the shoes of the road user

- Help them in the driving task
- Consider the unfamiliar driver
- Do not forget pedestrians & cyclists

Types of road signs

1. Regulatory (compulsory, mandatory)
2. Warning (cautionary)
Temporary – such as road works
3. Guide (information)
 - Direction
 - Tourist
 - Services
 - Traffic instruction
 - Traffic information





ТУМЕН





What is road safety engineering?

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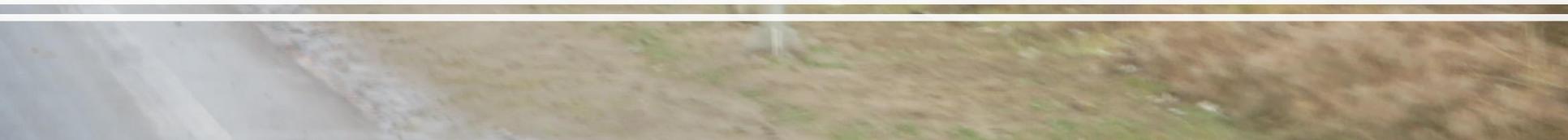
Warning Signs – two international standards

- 1 American
- 2 European

Colour: US: Black on yellow
Shape: US: Mostly diamond



China has another standard for warning signs





European
warning signs
– triangular,
red, black and
white



Temporary (Roadworks) Signs



Figure 9: Some Typical Road Work Signs Used in CAREC Countries



Source: 1968 United Nations Economic and Social Council Convention on Road Signs and Signals, commonly known as the Vienna Convention on Road Signs and Signals.

Guide (Direction) Signs

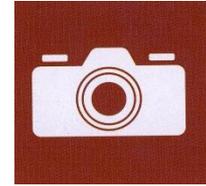


| | |
|----------|-----|
| QO'QON | 75 |
| NAMANGAN | 131 |
| ANDIJON | 199 |
| O'SH | 245 |
| QASHG'AR | 907 |

Guide (Confirmation) Signs

Guide Signs

Tourist signs - white on brown





Services Signs

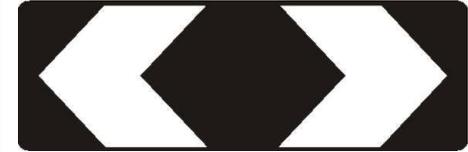
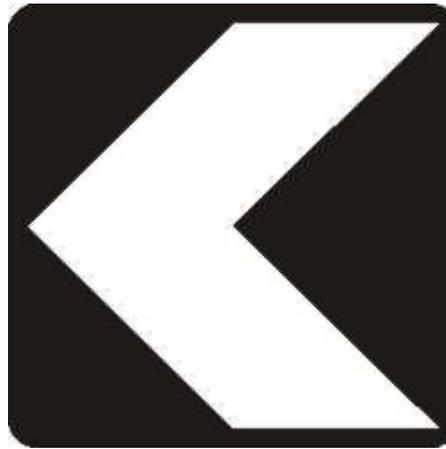
Colour: White on blue



Hazard Markers



Chevron alignment markers may be black on yellow, red on white, or a similar color combination. Having a good contrast between the two colors is an important safety requirement.



Hazard markers (of whichever pair of colors) are used to highlight curves and other hazards on the road ahead.





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ЗАМБЫН УГДААГУЙН СЭВЭГ
ЖО 5



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 or inconsistent information



Signs cannot:

- Educate the road user
- Physically prevent an action from occurring
- Be 100% effective
- Replace necessary civil works

Signing Principles – 6 C's

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





- **Conspicuous**
- **Clear**
- **Comprehensible**
- **Credible**
- **Consistent**
- **Correct**



- **Conspicuous**
- **Clear**
- **Comprehensible**
- **Credible**
- **Consistent**
- **Correct**

Too far from the curve!

Advance Sign Placement

Location of advance warning signs before the hazard or action point:

Urban areas, 50 km/h :
80 to 120 m

Rural areas, 80 km/h:
120 to 180 m

Freeways/highways, 100
km/h: 180 to 250 m





- **Conspicuous**
- **Clear**
- **Comprehensible**
- **Credible**
- **Consistent**
- **Correct**





- **Conspicuous**
- **Clear**
- **Comprehensible**
- **Credible**
- **Consistent**
- **Correct**

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2. THE CENTRAL AND STATE ARMED FORCES IN UNIFORM INCLUDING PARA - MILITARY FORCES AND POLICE
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GMR OSE HUNGUND HOSPET HIGHWAYS PVT. LTD.
CONTACT INFORMATION

CONTACT : GMR OSE HUNGUND HOSPET HIGHWAYS PVT. LTD.
 Address : Km.404.521 on NH-50, Survey No: 58,
 Shahapur (Village), Koppal (Taluk & Dist)
 Karnataka - 581401

Contact No : 08539 - 202 000

संपर्क : शिवाजी और एम.ए. हुनुगुंड रोडमार्ग कृषि इन्फो प्रोसेसिंग
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 शाहापुर (ग्राम) कोपल (तालुका और जिला)
 कर्नाटक - ५८१४०१

संकेत : ०८५३९-२०२ ०००

TOLL GATE AHEAD
 500m



- **Conspicuous**
- **Clear**
- **Comprehensible**
- **Credible**
- **Consistent**
- **Correct**



- **Conspicuous**
- **Clear**
- **Comprehensible**
- **Credible**
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- **Correct**



- **Conspicuous**
- **Clear**
- **Comprehensible**
- **Credible**
- **Consistent**
- **Correct**



Longitudinal separation – as a rule - separate signs by 2 seconds of travel time



Delineation

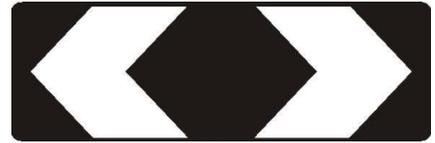
- Guide Posts & Delineators



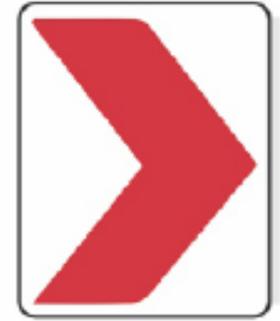
- Raised Reflective Pavement Markers (cats' eyes)



- Hazard Markers



- Chevron Alignment Markers (CAMs)



Guideposts

- White post 1 metre high, 100 mm wide
- Double sided on a two-way road
- Retro-reflective delineator
- Red on the drivers side (right)
- White on the opposite side (left)

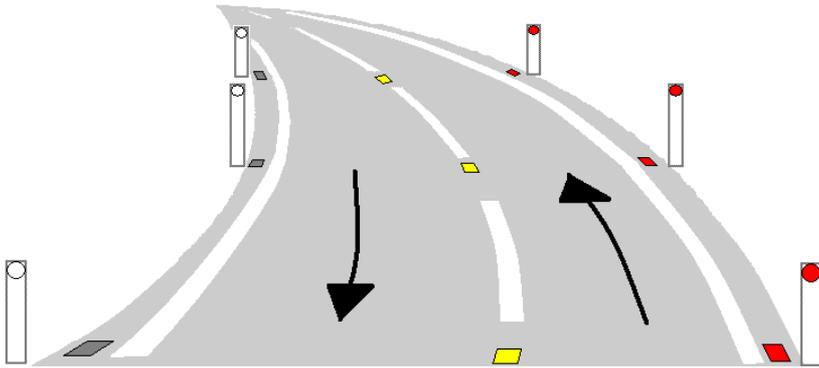
- Lateral placement:
 - 150 mm clear of outer edge of shoulder
 - 1.2 to 3.0 m from edge of traffic lane
 - Keep the lateral space consistent



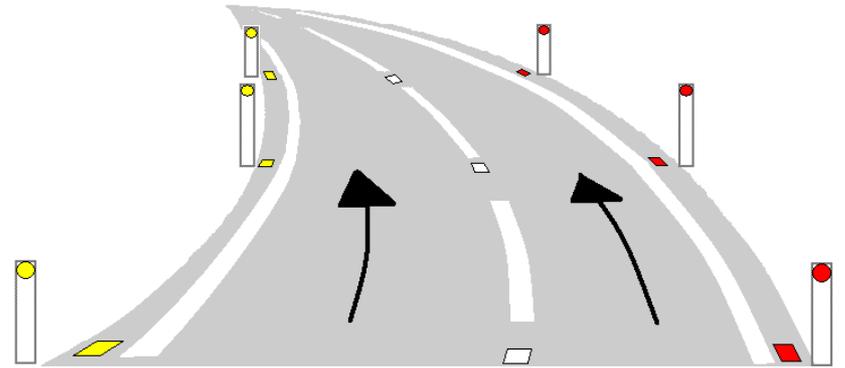




RRPM and guidepost delineator colours



Two-way roadway



One-way roadway

Guideposts

- Longitudinal spacing:

| | Spacing of Guideposts | |
|------------------------|-----------------------|-----------------|
| Curve radius | Outside of curve | Inside of curve |
| <100 m | 6 m | 12 m |
| 100 – 199 m | 10 m | 20 m |
| 200 – 299 m | 15 m | 30 m |
| 300 – 399 m | 20 m | 40 m |
| 400 – 599 m | 30 m | 60 m |
| 600 – 799 m | 40 m | 60 m |
| 800 – 1199 m | 60 m | 60 m |
| 1200 – 2000 m | 90 m | 90 m |
| > 2000 m and straights | 150 m | 150 m |





Chevron Alignment Markers

Reserve CAM's for substandard curves only

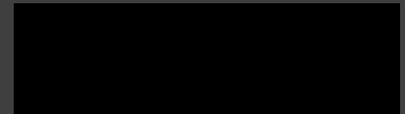
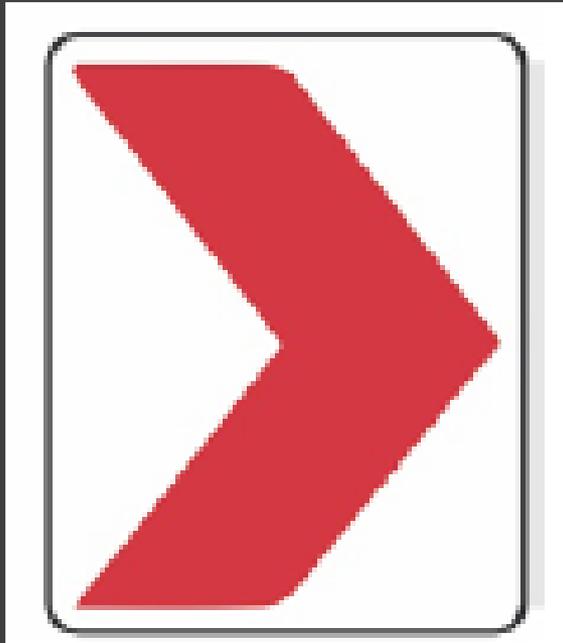
Only place on outside of curve

Always show CAM's for both directions

Minimum of 3 CAM's in each direction

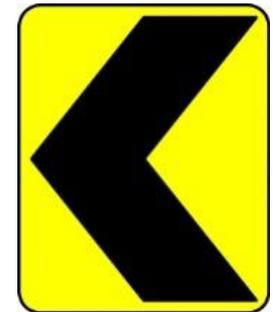
Drivers should be able to see 3 CAM's at all times

Space them evenly (but avoid driveways, lanes, other obstructions)



Chevron Alignment Markers

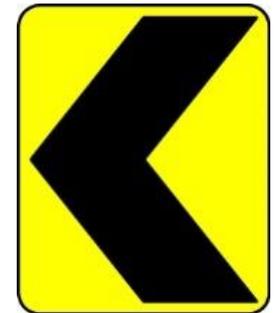
- Lateral placement:
 - min 600 mm clear of road shoulder
 - 2 m to 5 m from edge of traffic lane
- Height to bottom of sign:
 - 1.2 m to 1.5 m above road surface
 - Arrange height to give smooth appearance



Chevron Alignment Markers

- Longitudinal spacing on curves:

| Curve radius | CAM Spacing | |
|--------------|--------------------------|--------------------------|
| | Approach speed < 85 km/h | Approach speed ≥ 85 km/h |
| < 50 m | 10 m | 6 m |
| 50 – 99 m | 12 m | 8 m |
| 100 – 149 m | 18 m | 12 m |
| 150 – 199 m | 24 m | 16 m |
| 200 – 249 m | 30 m | 20 m |
| 250 – 299 m | 36 m | 24 m |
| > 300 m | 40 m | 26 m |



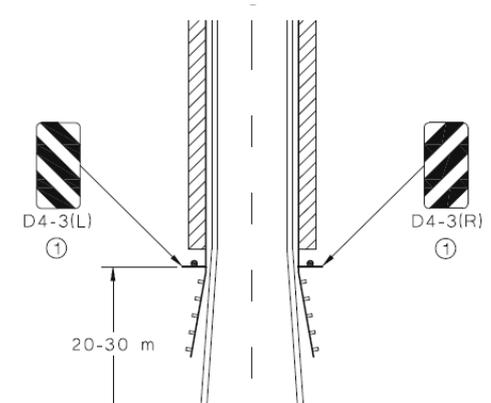
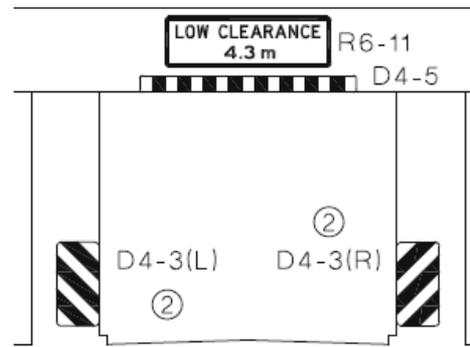






CAM's are for use around the outside of curves – not on inside!

Width Markers



- Culverts
- Bridge piers
- Bridge end posts
- Railway level crossings





LINE MARKING

- Provides longitudinal and also lateral guidance for drivers/riders
- Guides them along the road, guides them to turn, instructs them where to stop and where NOT to stop
- Usually thermoplastic
- Can also be tactile



Pavement Markings

- Dividing lines (centre lines)
- Lane lines
- Edge lines
- Pavement arrows
- Stripes and chevron markings
- Words
- Symbols

- Materials:
 - Paint
 - Thermoplastic
- Retro-reflective glass beads



Good line marking
is a valuable
safety tool!

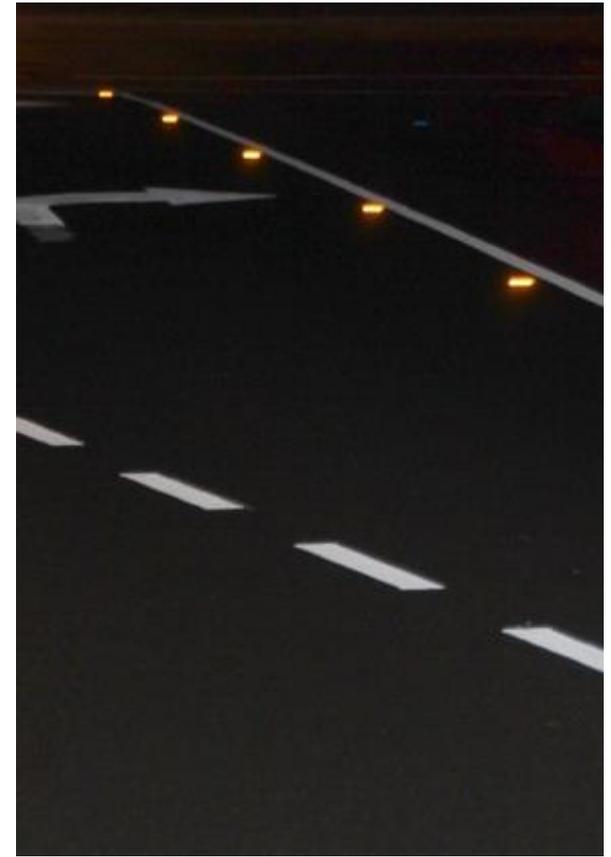


Faded (or no) line markings make it difficult for drivers to safely retain their location on high speed roads.



Tactile edge lines – can help to alert drivers when they start to drift off high speed roads.





Raised pavement markers





Raised
pavement
markers



Conclusion

- Signs and markings are important to regulate, warn and guide road users
- Remember the 6 C's:
Conspicuous, Comprehensible, Clear, Credible, Consistent and Correct
- The signs can be hazards in themselves – make them as forgiving as possible
- Bad signing leads to driver distraction, lack of warning, misunderstanding

THANK YOU –
QUESTIONS WELCOMED

