LISBOA 2010
MAY 25/28

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Modern Technologies in Road Traffic Signs

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www.irf2010.com

Modern Technologies in Road Traffic Signs

Overview

1. Traffic Sign Requirements
2. Retroreflective Technology
3. Environmental Aspects
4. Driver's Needs - Effectiveness

1. Traffic Sign Requirements (CIE No. 74)

- Conspicuity
- Legibility (at all conditions and relevant distances)
- Comprehensibility (ease of understanding)
- Credibility (driver to act upon sign)

Traffic Sign Requirements (CIE No. 74)

Traffic Signs & Traffic Safety

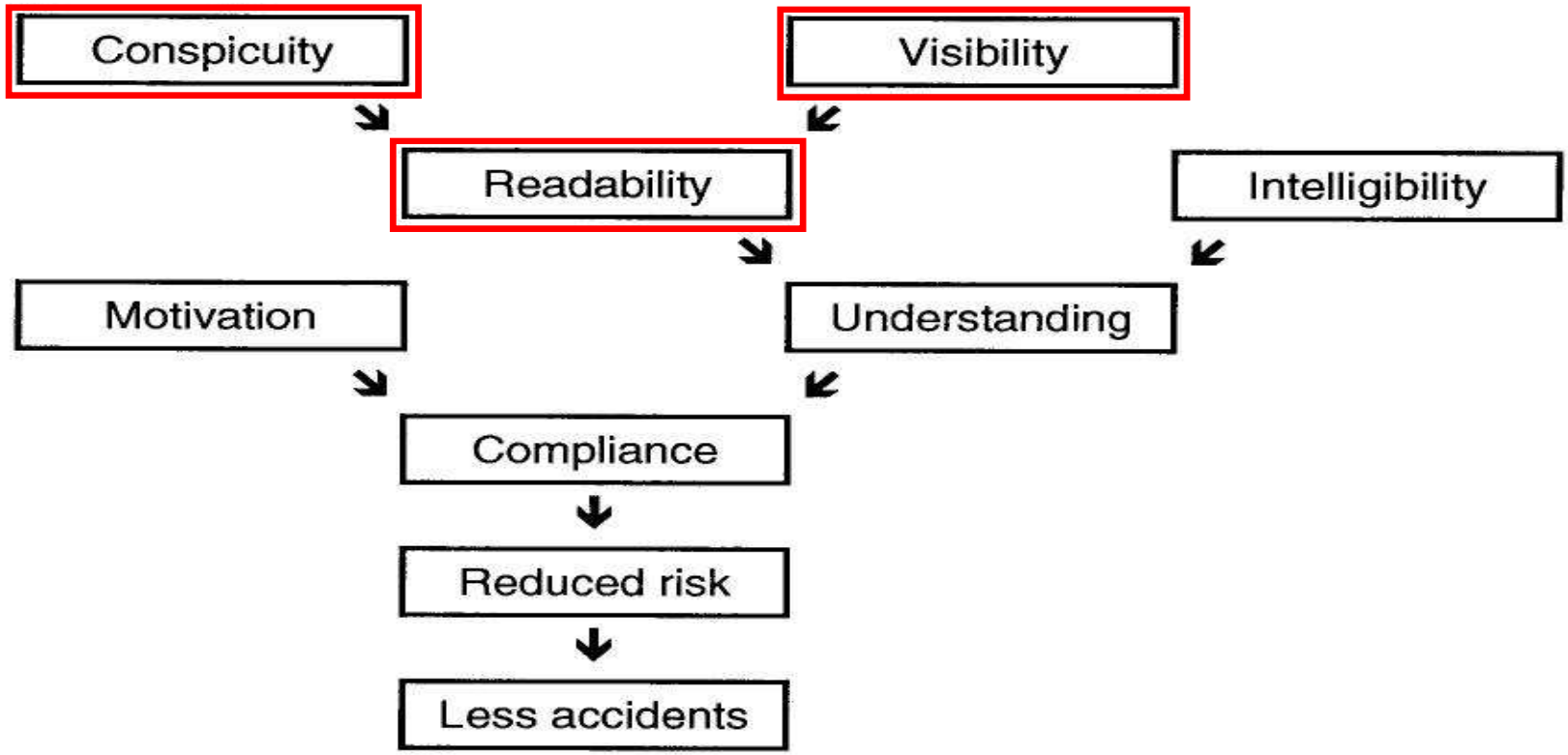
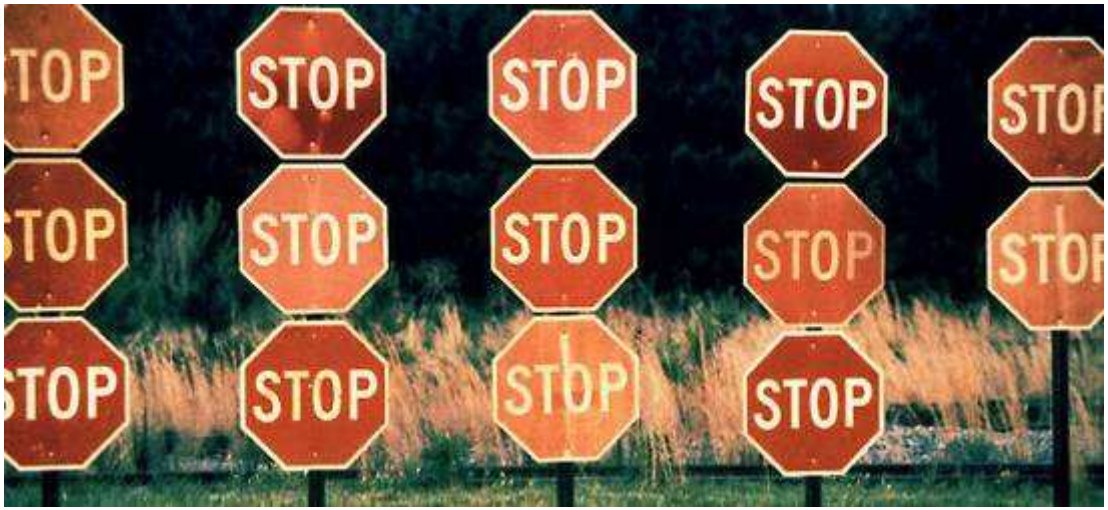


Figure 24: A general model of factors that affect the effects of traffic signs on road safety

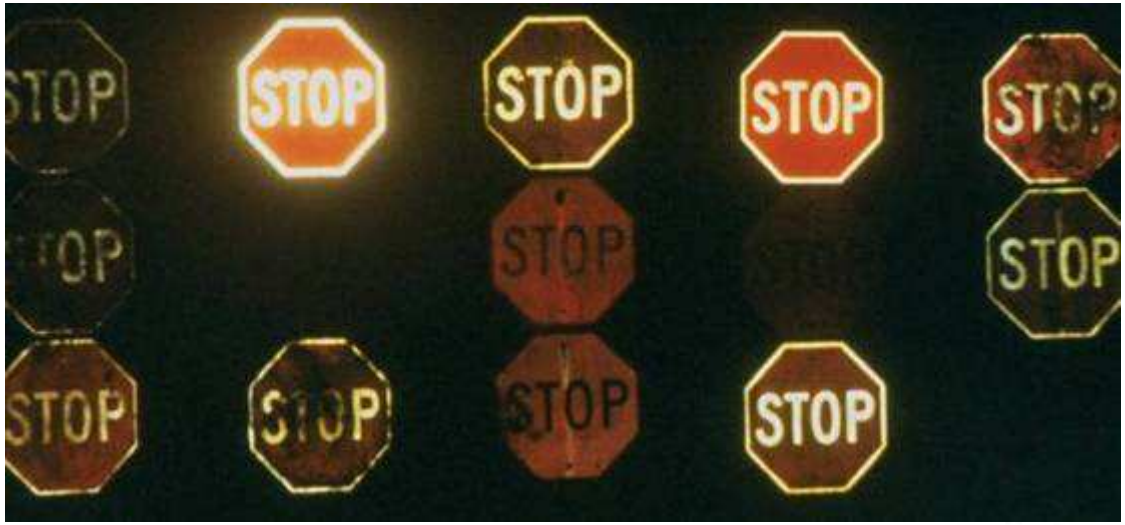
Source: *"General Overview on Road Safety," Lecture Notes, Dr. Rune Elvik, Institute of Transport Economics, Norway, Sept.1999.*

Conspicuity and Legibility

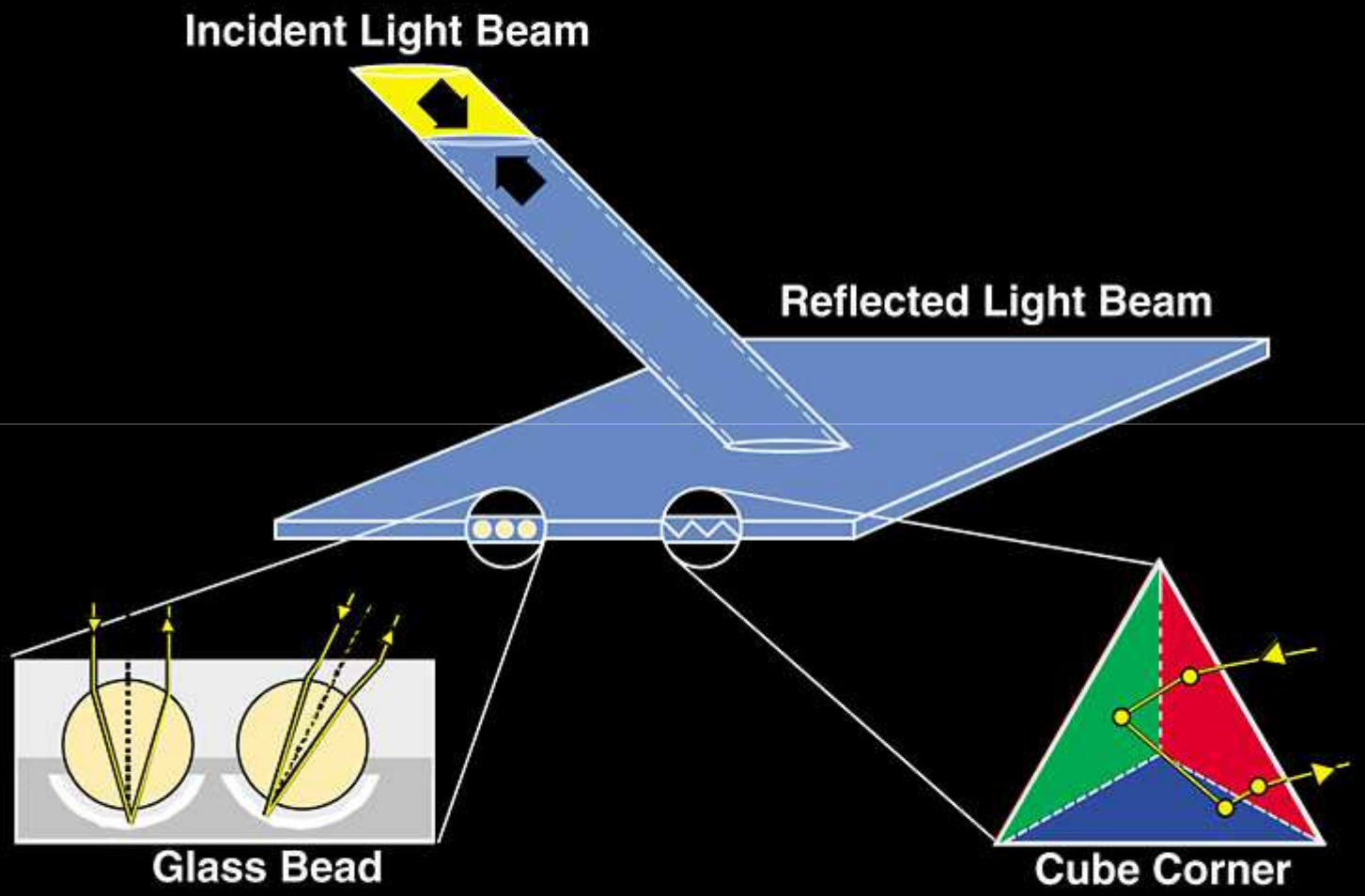


What you see during the day

Is not always what you get at night

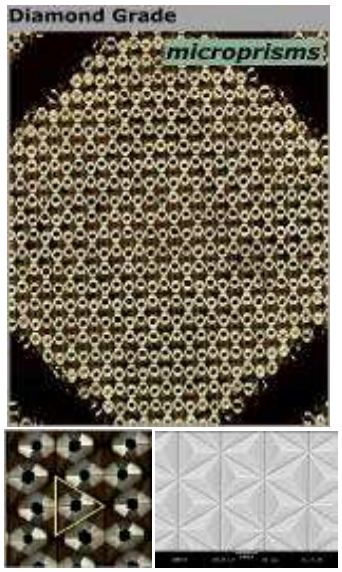


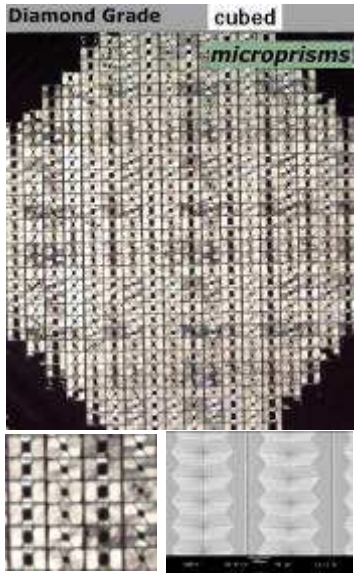
RETROREFLECTION



Two Systems of Retroreflection

Retroreflective Sign Sheeting History





1939 : Birth of the first Scotchlite product

1948 : Development of Engineer Grade sheeting

1949 : Introduction of retroreflective fabrics

1965 : Introduction of Scotchlane marking tapes

1971 : Introduction of High Intensity Sheeting

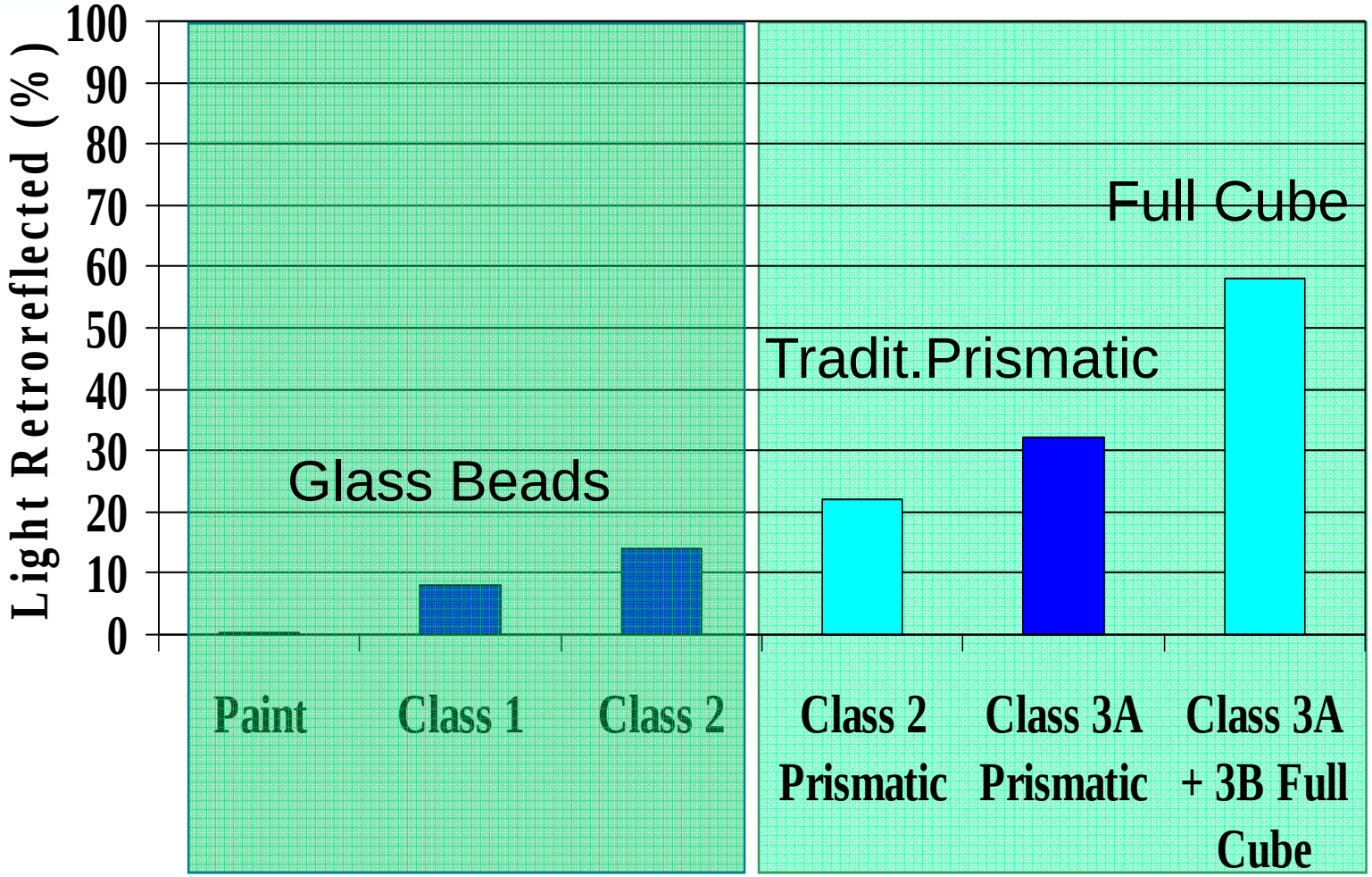
1976 : Introduction of Stamark marking tapes

1988 : Introduction of Diamond Grade sheeting

2005: Introduction of Diamond Grade Cubed sheeting

1940 1950 1960 1970 1980 1990 2000

Light Return Efficiency



‘Use Table’ Spain

TABLE 701.3
CRITERIA FOR SELECTING THE MINIMUM LEVEL OF RETROREFLECTION

TYPE OF SIGN OR NOTICE	LOCATION OF SIGN OR NOTICE		
	URBAN FRINGE AREA (side streets, ring roads)	MOTORWAY, DUAL CARRIAGEWAY AND FAST LANE	CONVENTIONAL ROAD
POLICE SIGNS	Level 2 (**)	Level 2	Level 1 (*)
GUIDE SIGNS	Level 3	Level 3	Level 2 (**)

(*) “Level 2” must be used for signs indicating danger warnings, priority and no entry.
(**) The suitability of “Level 3” must be studied whenever the surrounding lighting hinders visibility where it is thought necessary to increase road signs and in areas where large traffic flows converge or diverge, intersections, junctions etc.

Performance Classes

prEN 12899-6 'Visual Performance'

- Guideline for the Selection of Performance Classes

  ≈ Class 1 'Inadequate Performance…'

  ≈ Class 3 'Much better performance, but still reduced compared to daylight'

3. Environmental Aspects

(Prismatic Reflective Sheeting Production compared to Glass Bead ‚Class 2')

Saving in VOC emission

- 97%

Reduction of Solid Waste

- 46%

Saving in Energy Consumption

- 77%

Traffic Signs & Traffic Safety

Is it effective ?

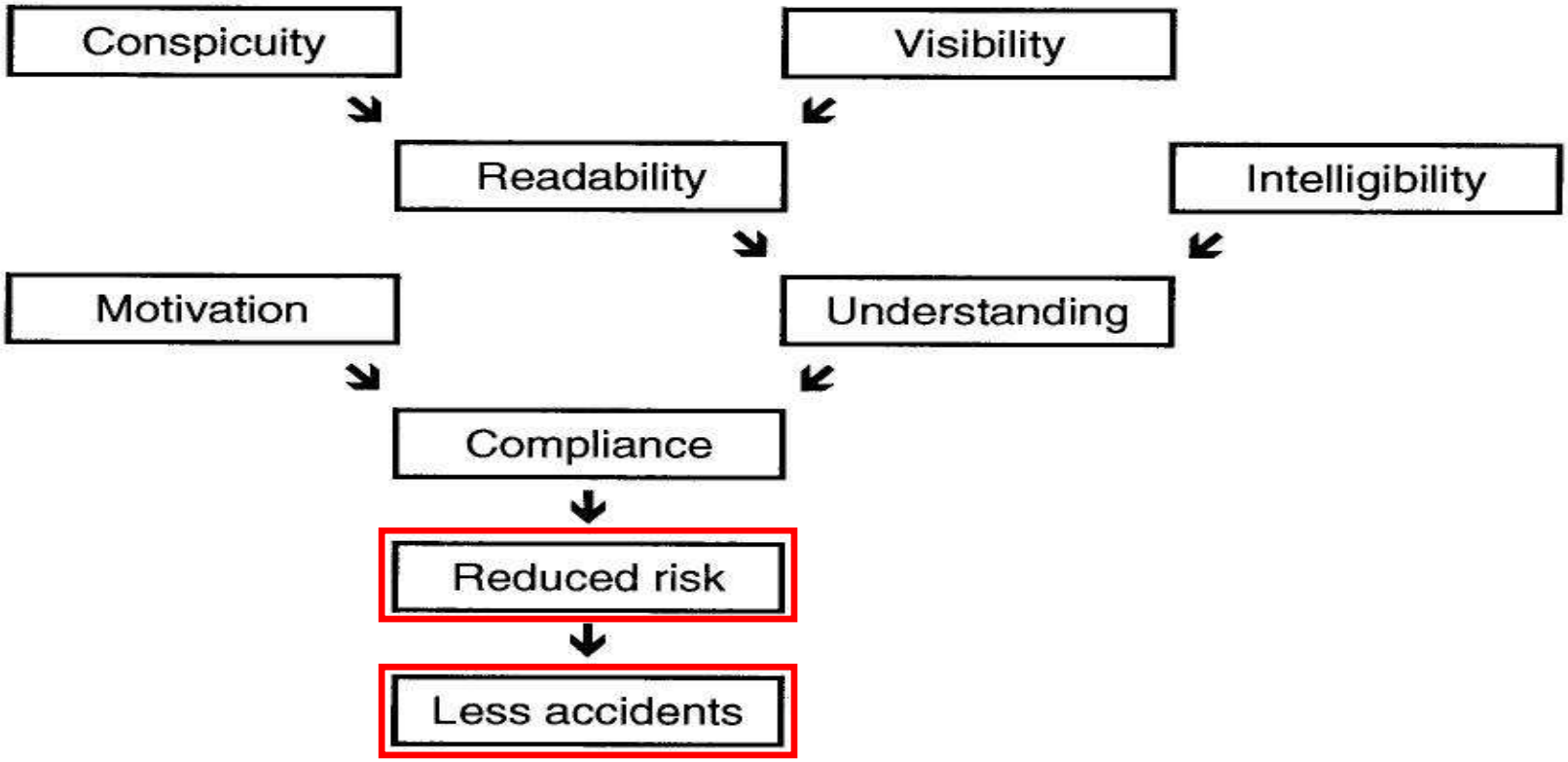


Figure 24: A general model of factors that affect the effects of traffic signs on road safety

Source: *"General Overview on Road Safety," Lecture Notes, Dr. Rune Elvik, Institute of Transport Economics, Norway, Sept.1999.*

4. Driver's Needs - Effectiveness

Review of latest research

1. Subjective Rating
2. eye tracking study
3. % drivers served concept

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On-Road Test
‘Traffic Sign Performance’
Glass Bead vs. Microprismatic Technology

Kuratorium für Verkehrsicherheit KfV, Vienna, 2005

Authors:

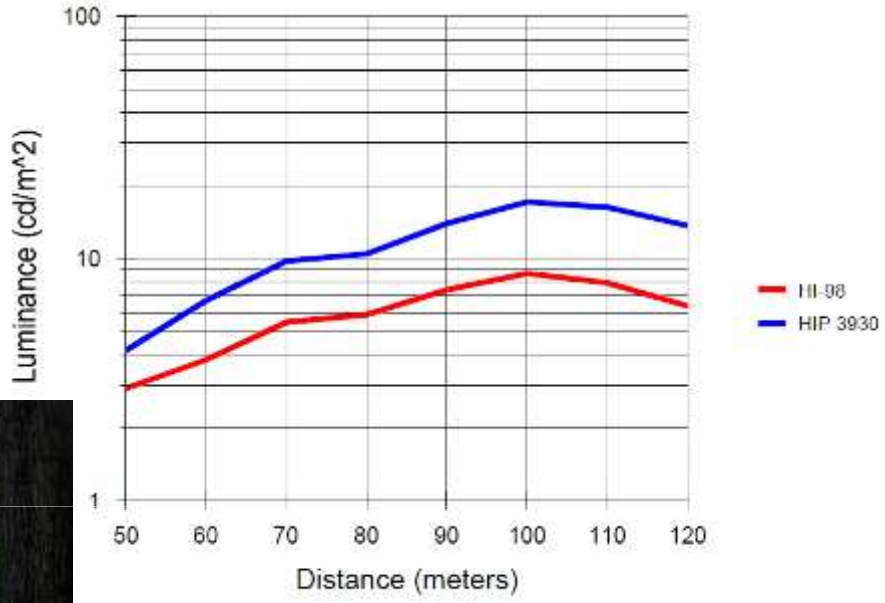
Dr. Michael Gatscha

Sandra Reichenauer

On-Road Test

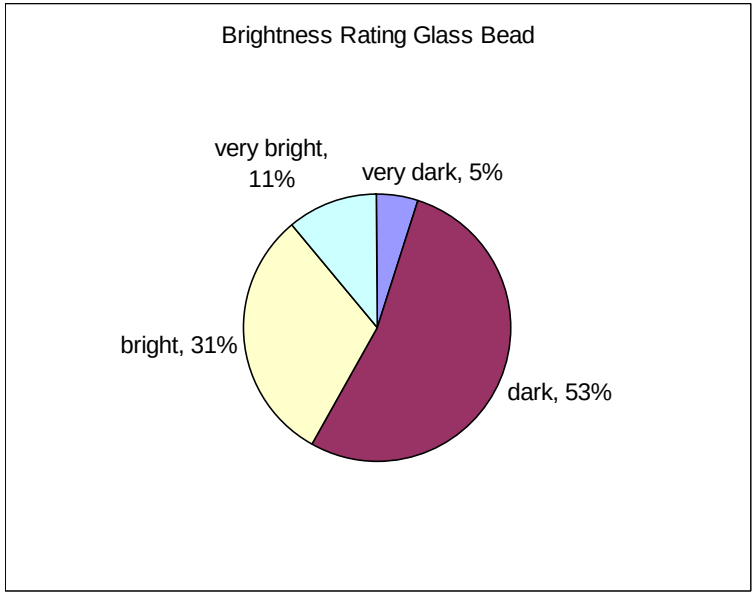
Glass Bead vs. Prismatic

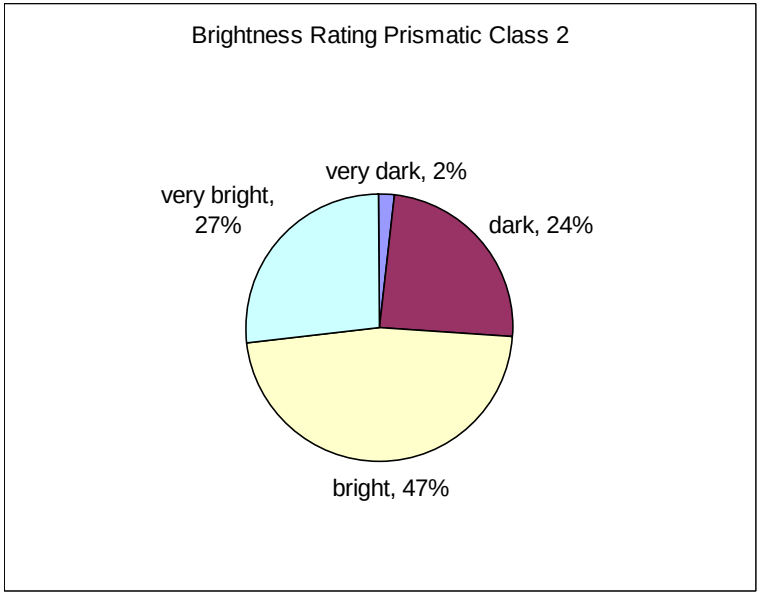
Class RA 2 according EN 12899-1



On-Road Test

subjective brightness rating





- Prismatic Class 2 Technology is ‘bright enough’ for 74%
- Glass Bead only ‘bright’ for 42%

Perceived brightness often correlates with age

Analysis of eye movement characteristics for different performance classes of retro-reflective traffic signs

Kuratorium für Verkehrsicherheit KfV, Vienna, 2006

Authors:

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Günther Schreder

Sandra Reichenauer

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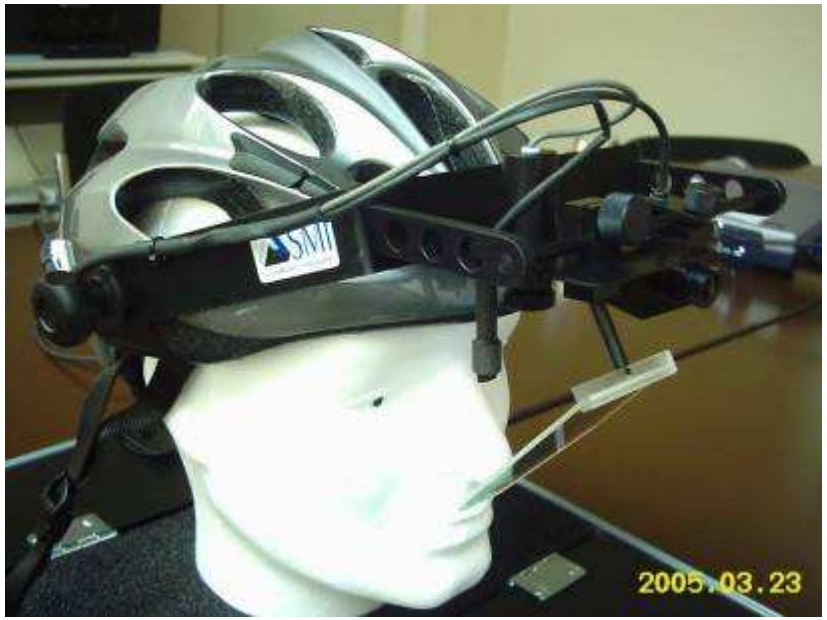
Eye Tracking study Vienna

Eye tracking equipment:

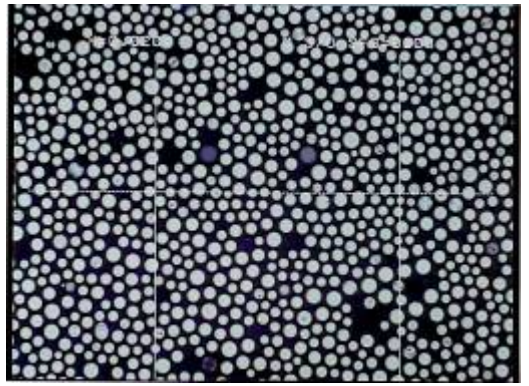
monitors and records eye movements



On-Road scene and viewing direction

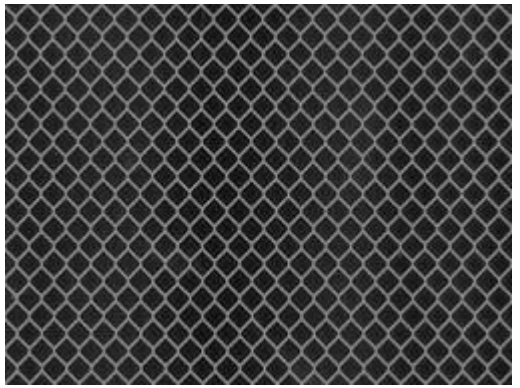
Objective

Two different classes of retro-reflective traffic signs



- **Class 2 EN 12899-1**

„current“ (~ 80% use of glass bead technology in Europe)

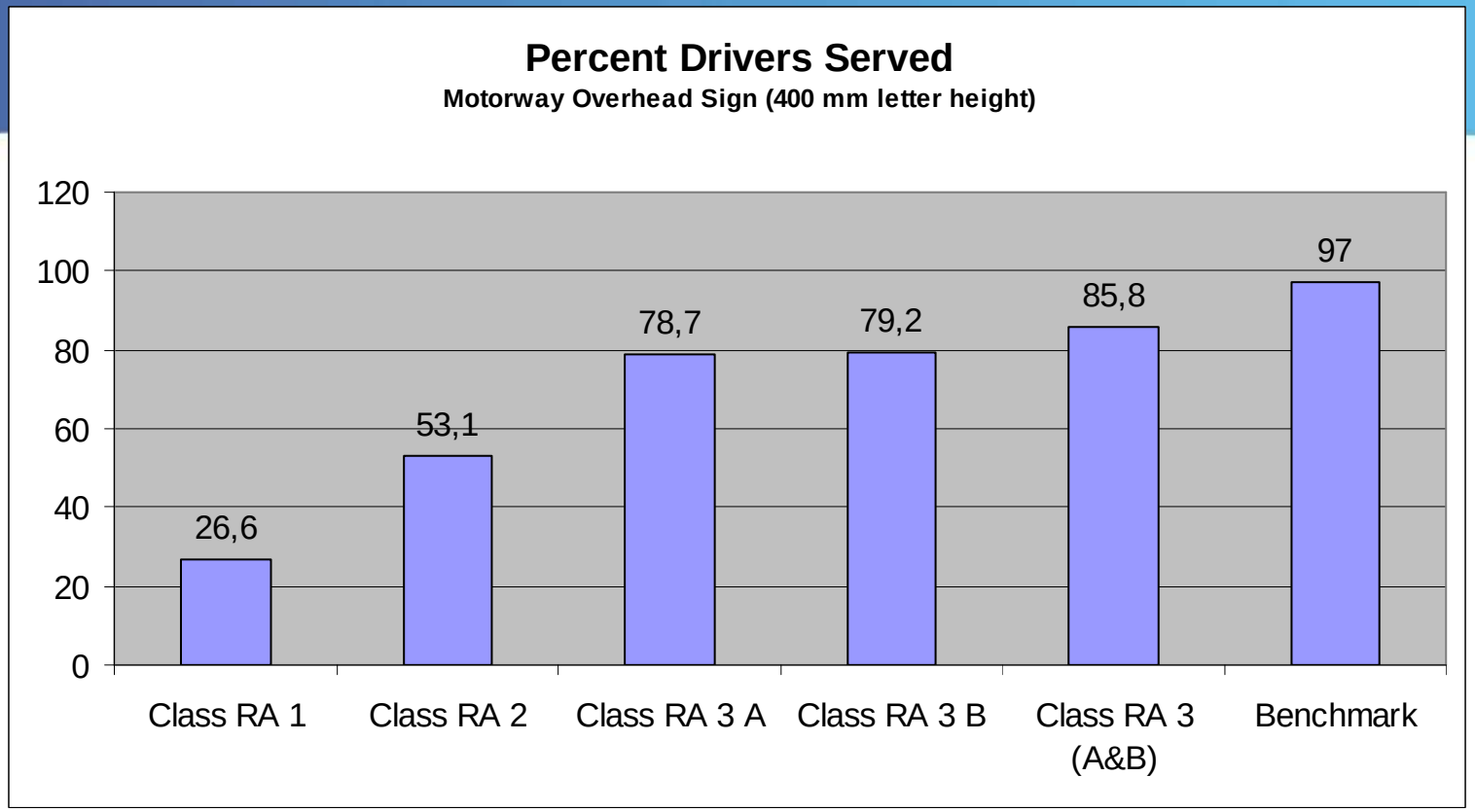


- **Class 3 DIN 67520**

„state of the art“ (full cube microprismatic, „DG³“)

Conclusion

- **Information on Class 3 traffic signs was perceived faster**
- **Class 3 traffic signs have a positive impact on observation behaviour and on traffic safety itself**
- **Drivers have potentially more time to concentrate on other essential stimuli in traffic (e.g. pedestrians, cars, obstacles…)**



- Calculated 'Percent Drivers Served' level for an overhead sign with large letters (representative of motorways).

- Glass bead technology (Class RA 1 and RA 2) can only satisfy the performance expectations of a small percentage of drivers

- Microprismatic materials give much better service levels, closer to the benchmark performance.

Questions?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Traffic Safety Systems Division
Thank You
YOUR SPEED
25
IMPULSE