

“End-Of-Bar” Study
Evaluation and Proposals
for improvement

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“End-Of”-Bar: Introduction

The following presentation explores the possibilities for harmonisation and improvement of the oblique End-Of-Bar (“Bar”) in the 1968 Convention on Road Signs and Signals.

The current 6 Bar possibilities, paired with options, such as superimposition on or use behind a symbol etc. , as well as inconsistencies in the Convention itself multiply variants of signs allowed for use which not always produces optimum results (visual discrimination, pattern recognition, understanding). In addition, the current situation does not allow for a coherent expansion of the Convention’s sign system.

“End-Of”-Bar: Goal

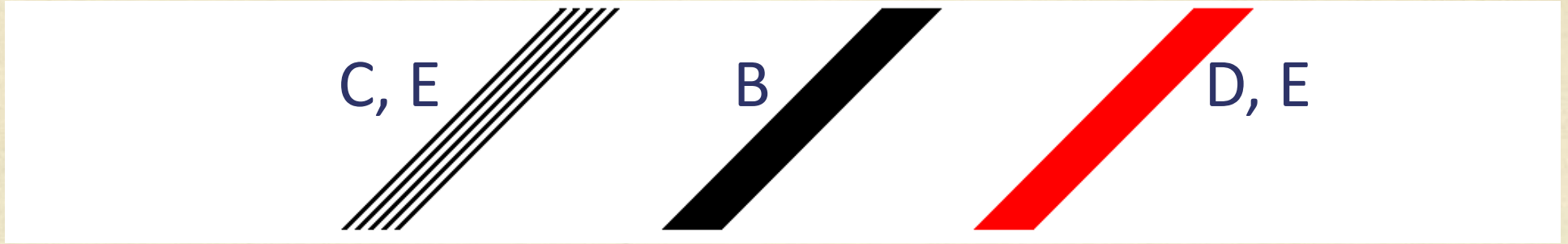
It is aimed at preventing inadequate use of the Bar on signs by reducing possibilities of use in the Convention to those appropriate, arriving at more precise instructions and recommendations.

This is done whilst focussing

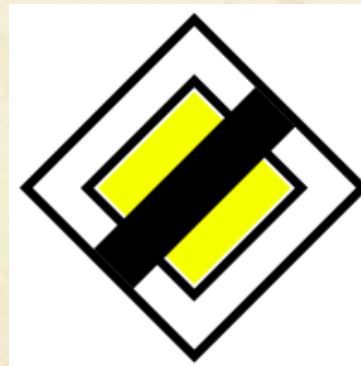
- on visual criteria of a signal aspect to support drivers understanding, and
- on choices to allow for the Convention’s signs system to become coherently expandable and maintainable.

“End-Of”-Bar: Current status

Shown in the Convention’s sections:



Etc.



Etc.

“End-Of”-Bar: Current status

Described (allowed) by the Convention:

B, C, E:



D, E:

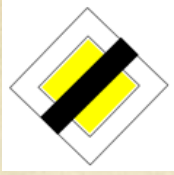


E, 8abcd:



Number of lines forming a bar:
Not specified by the Convention

B



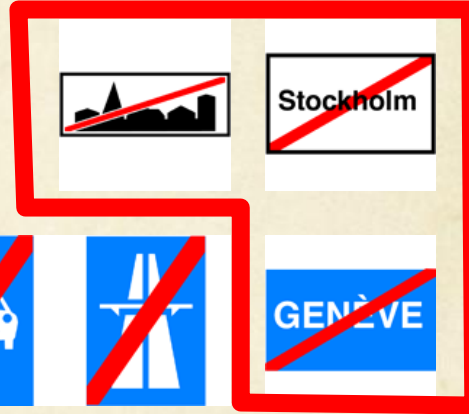
C



E



D

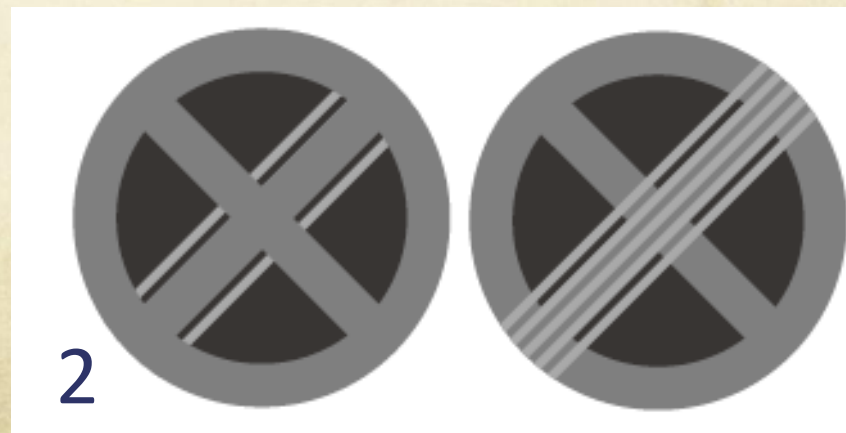
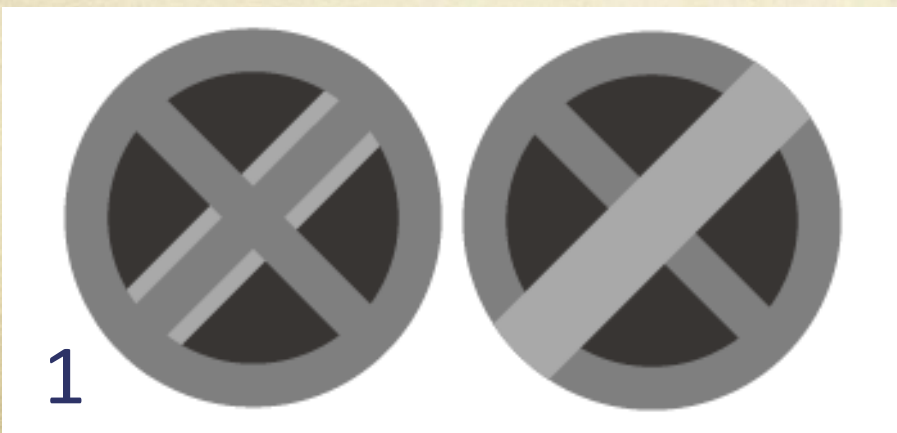


Convention allowing for bar of parallel lines:
■ of **black** or grey colour / ■ of **red** colour

“End-Of”-Bar: In front or behind a signal aspect?

If behind, it should be solid (1), not to obstruct the symbol, but remain visible. Bars formed of lines only make sense when in front of a symbol (2).

Conclusion: Adequate visibility of signal aspect and bar, to form a visible and comprehensible “End-Of” message is only given through frontal use of a bar of parallel lines.



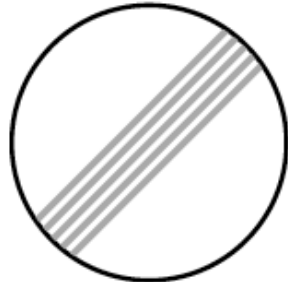
“End-Of”-Bar colour: Black or grey



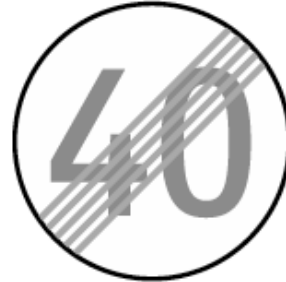
E, 10a/b



E, 9c



C, 17a



C, 17b
E, 10d



C, 17c



C, 17d

Colours precisely as in Convention, grey of Bar not specified there. Bar needs to be of visibly lighter grey due to required contrast in E, 10a/b and E, 9c – leading to a too low contrasted signal aspect in C, 17, as well as in the areas of white surrounding “Zones”-background in E, 10a/b & E, 9c.

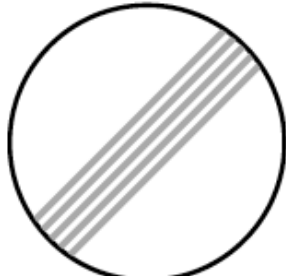
“End-Of”-Bar colour: Black or grey



E, 10a/b



E, 9c



C, 17a



C, 17b
E, 10d

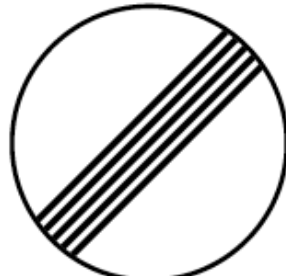


C, 17c



C, 17d

Due to low contrast, a grey Bar is hard to discriminate, resulting in a less discriminable signal aspect of signs.



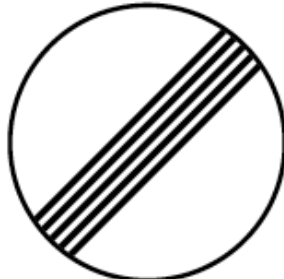
“End-Of”-Bar colour: Black or grey



E, 10a/b



E, 9c



C, 17a



C, 17b
E, 10d



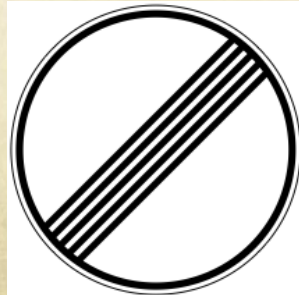
C, 17c



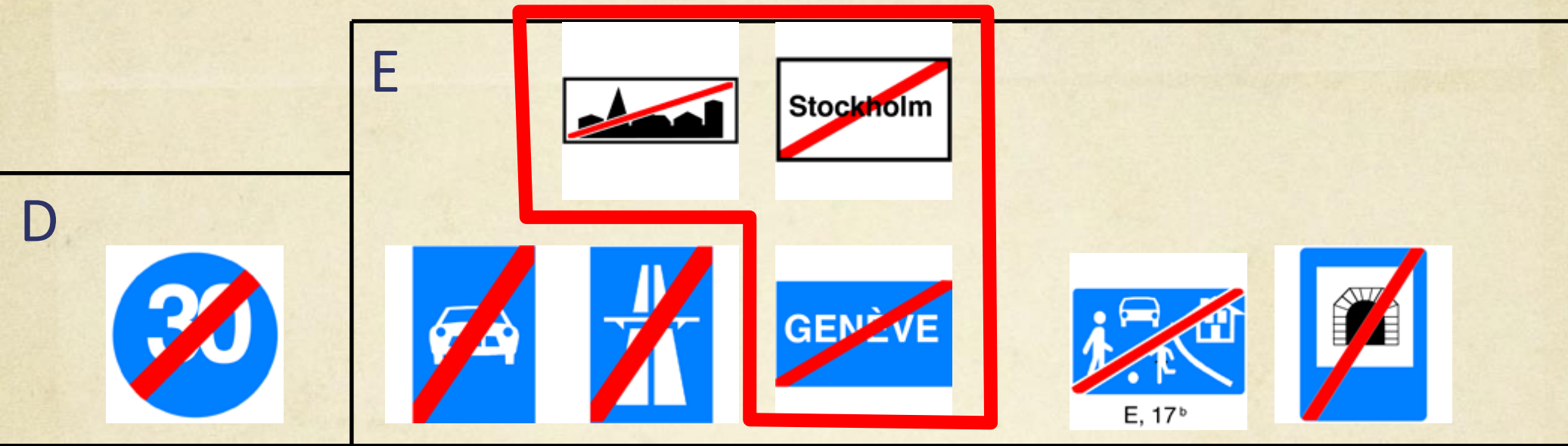
C, 17d

Conclusion: Use black for End-Of-Bar for adequate contrast in the effected signs.

Germany's use of the Bar supports above conclusions:



“End-Of”-Bar colour: Red

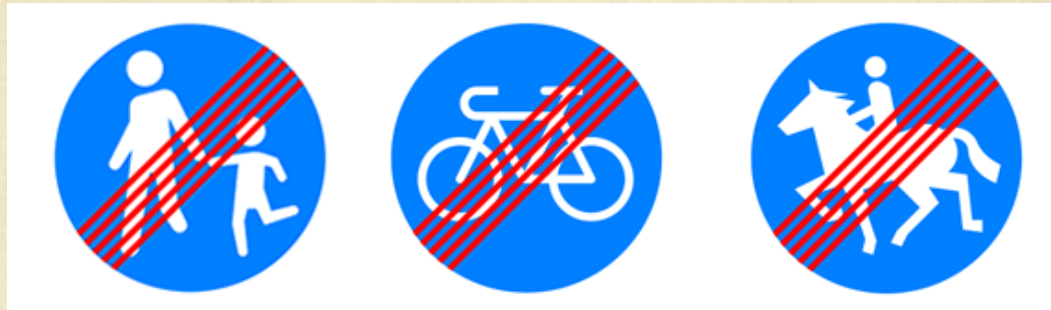


Previous conclusions – recommended frontal use of a bar formed by parallel lines – are valid also for signs where a red End-Of-Bar is to be used. Yet, the Convention currently allows for red End-Of-Bars made of lines only in E, 8abcd (End of built-up area).

“End-Of”-Bar colour: Red



D, 8



D, 5x

D, 4x

D, 9x

Conclusions: Have Convention allow for Bars of lines for all End-Of-signs utilizing red bars to make underlying symbols more discriminable, as there is a growing demand for and number of end-of-signs and a need to discriminate and differentiate symbols and read place names with ease.

“End-Of”-Bar: How many parallel lines?

The width of a Bar should remain as-is, keeping the ratio to dimensions of a current sign’s signal aspect for ease of recognition.

Number of lines isn’t the real question, rather:

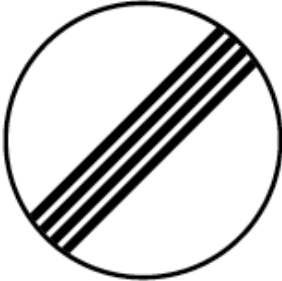
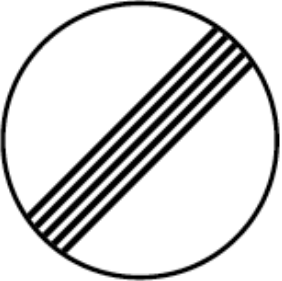
- **Is the underneath symbol sufficiently visible?** =
sum of width of spaces between lines
- **Are lines capable of providing sufficient contrast and colour to form a distinct End-Of-Bar?**=
line width

Design iterations are needed to give indications:

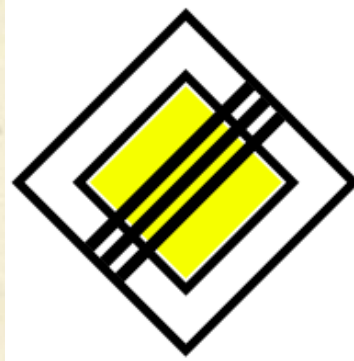
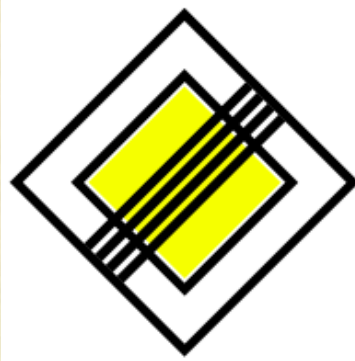
“End-Of”-Bar: Lines and spaces in-between



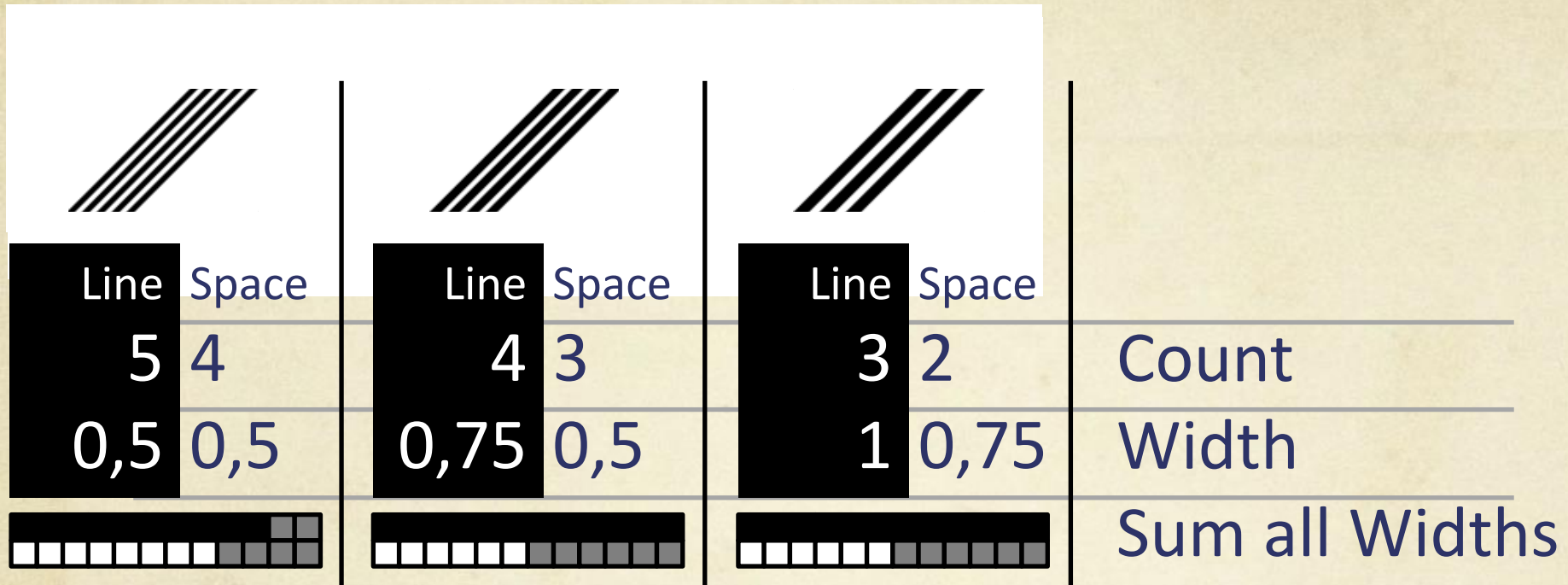
“End-Of”-Bar: Lines and spaces in-between



“End-Of”-Bar: Lines and spaces in-between



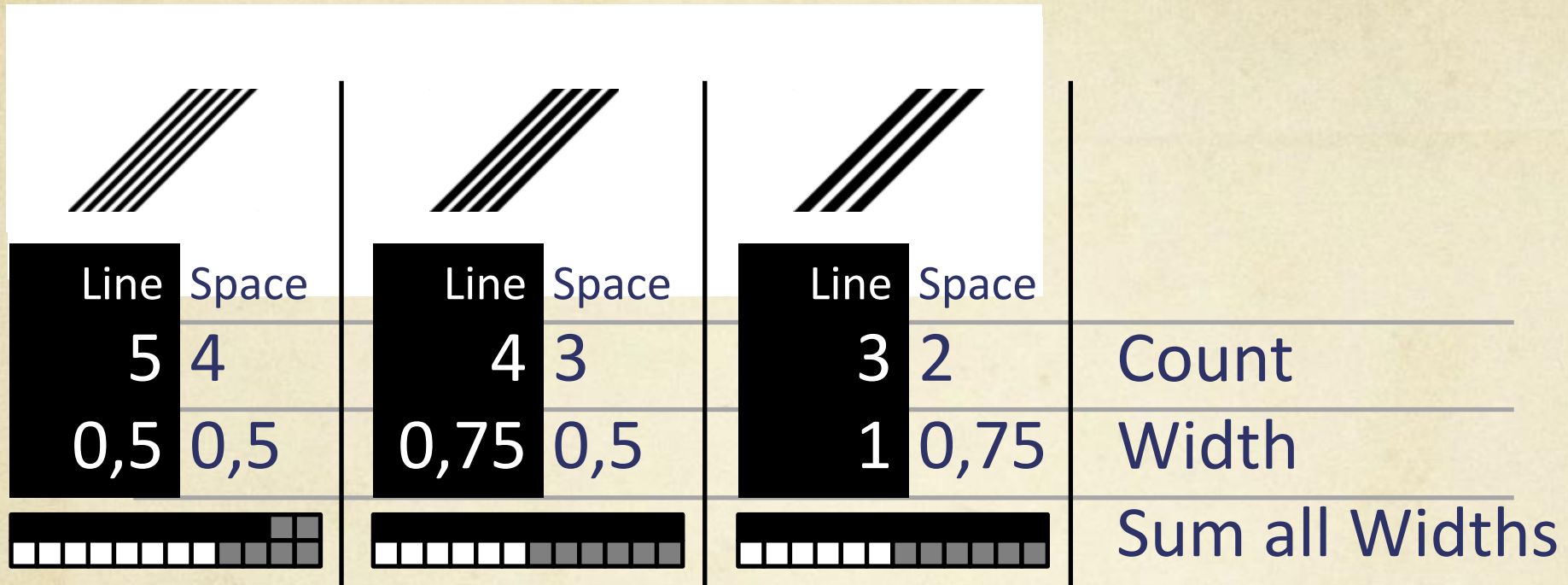
“End-Of”-Bar: Lines and spaces in-between



5/4: (left) highest number of visual clues on symbol, but with small spaces. Lowest colour & contrast display of Bar due to thinnest lines.

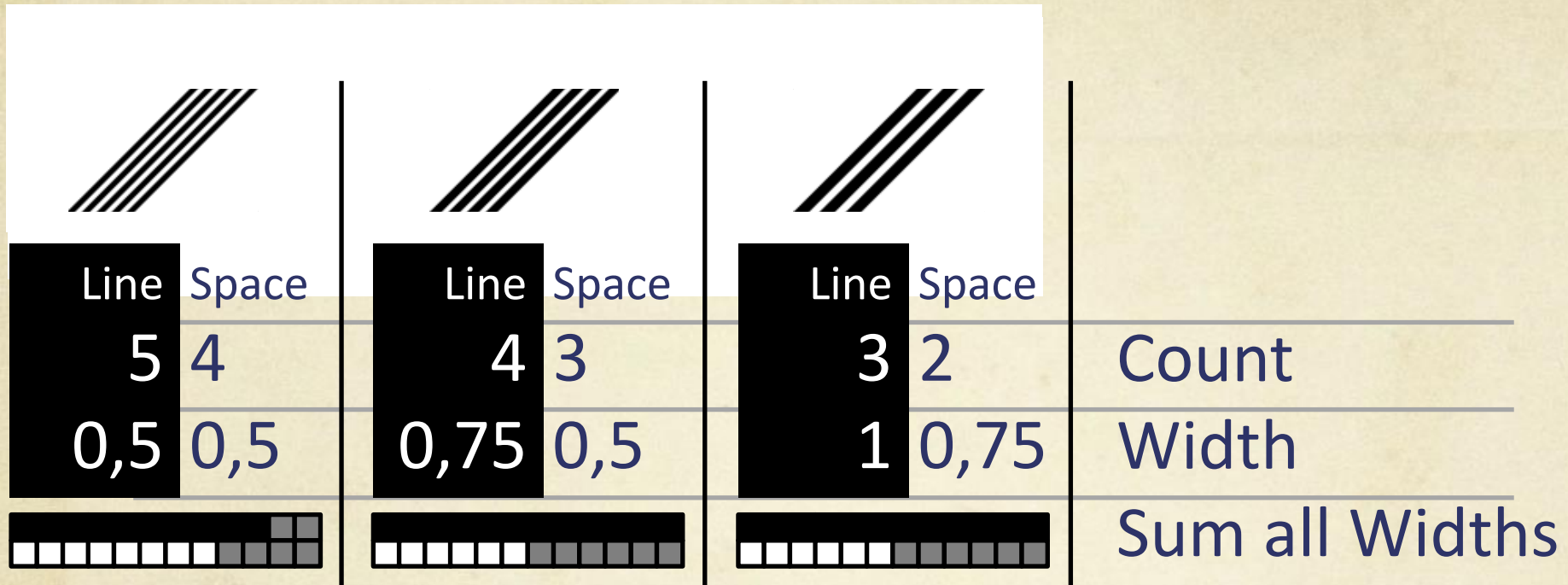
4/3: (middle) lower no. of vis. clues, and small spaces. Stronger colour & contrast for Bar through medium lines.

“End-Of”-Bar: Lines and spaces in-between



3/2: (right) lowest number of visual clues on symbol, but largest individual spaces, while sum of width of spaces is identical to 4/3. Highest colour & contrast for Bar due to widest lines.

“End-Of”-Bar: Lines and spaces in-between



Conclusion: 4/3 and 3/2 bear higher contrast & colour for Bar, while the sum of added up widths of spaces are equal these Bars.

-> Use 3/2 for resemblance to B, 4 and the current red end-of-Bar, and strongest Bar contrast and colour.

“End-Of”-Bar: Degree-of-angle

In the Convention, there are 2 + x angles of End-Of-Bars: **45°**, **55°** and several of **unknown angle** (governed by the dimensions of rectangular sign used).

While End-Of-signs in sections B and D bear 45° Bars, Signs in section C use 55°.

55° may have been chosen

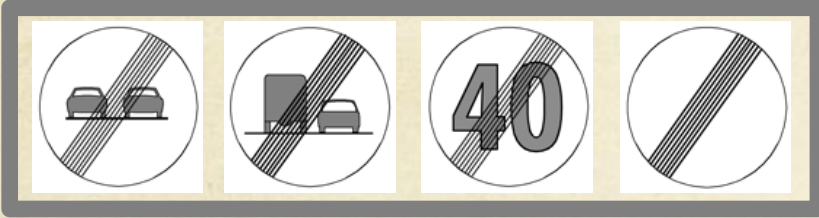
- a) to less obstruct the view on the symbol behind
- b) to differentiate the signal aspect

Both may be considered as of little effect.

B



C



D



E



End-Of-Bar-angle in the Convention:

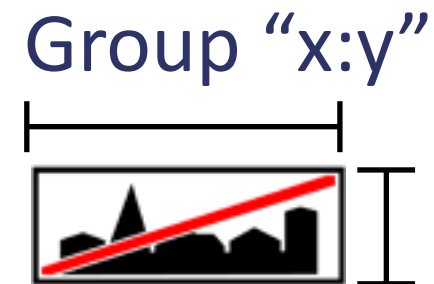
■ 45° / ■ 55° / ■ depending on sign format

“End-Of”-Bar: Degree-of-angle

Angles of section E):

Variable angle due to unspecified sign formats

These Bars run from corner to corner. Harmonisation of angles may be achieved by introducing ratios for sides (e.g. $w:h = 2:3$, $3:2$ etc.) of groups of rectangular signs in the convention. Examples:



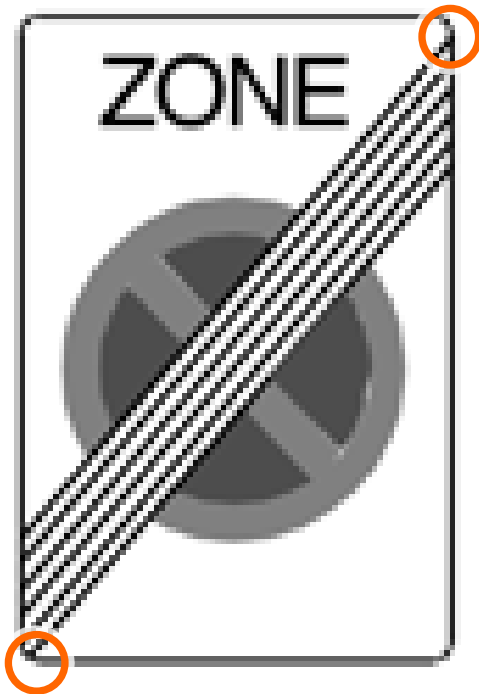
“End-Of”-Bar: Degree-of-angle

Angles of section E):

2 ways of Bars meeting corners of signs

at margins

(E10
“Zone-
Signs”)



at centerline

E5b,
E6b,
all E8



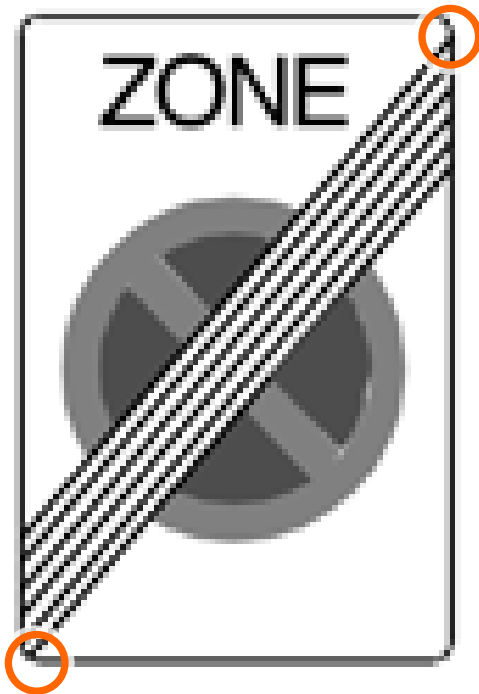
“End-Of”-Bar: Degree-of-angle

Angles of section E):

2 ways of Bars meeting corners of signs

at margins

(E10
“Zone-
Signs”)



May have been chosen to allow for more space for inscriptions on top and bottom, such as “ZONE”, time, duration information.

“End-Of”-Bar: Recommendations

Primary, 1

- General use of Bars formed from 3 parallel lines (3/2 Bar) for all End-Of-Signs in the Convention.
Change Convention to generally allow this for signs in section D, and non-built-up area signs in E.
- General use of black colour for the Bar, except where the Convention requires red End-Of-Bars.



“End-Of”-Bar: Recommendations

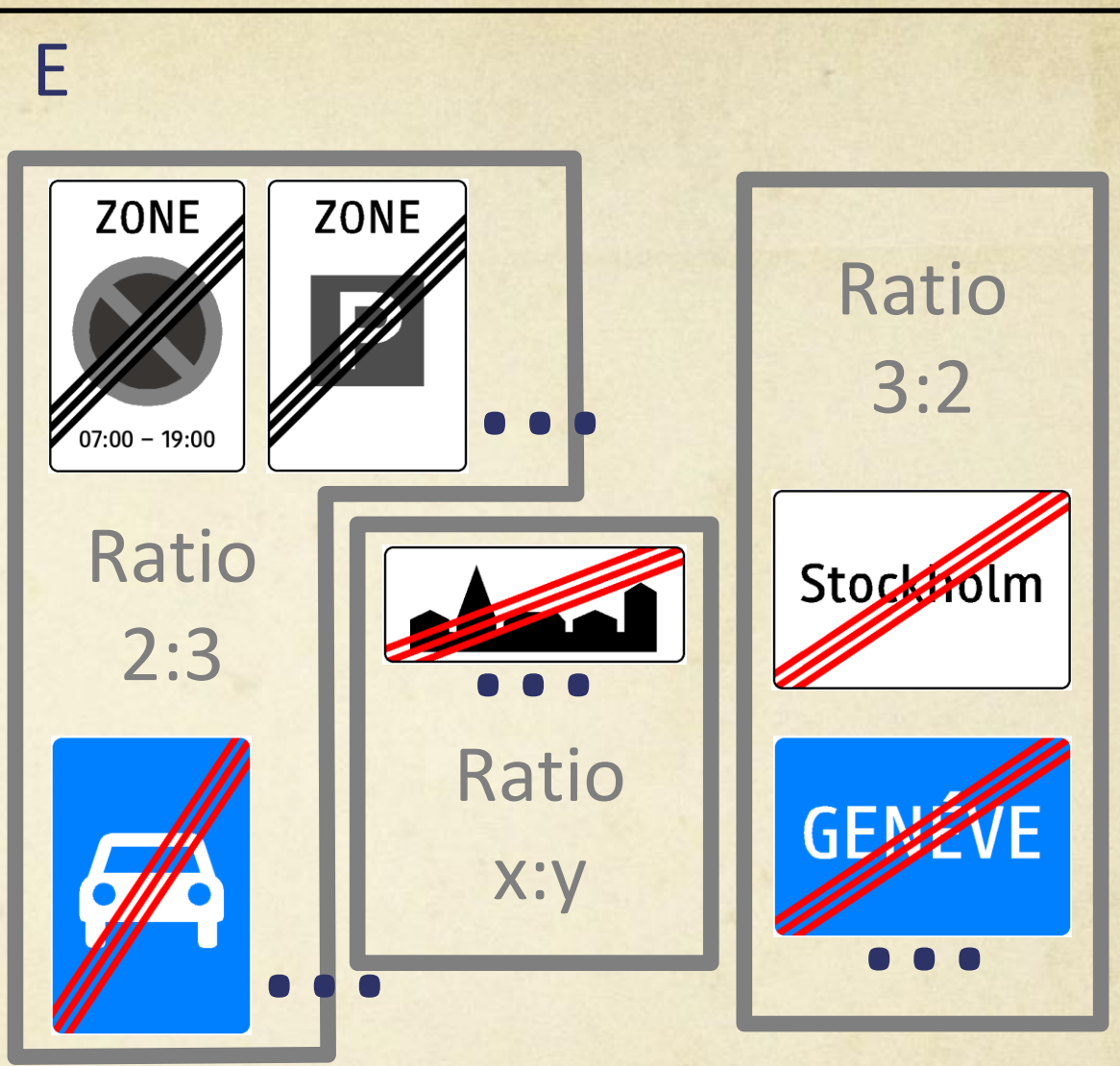
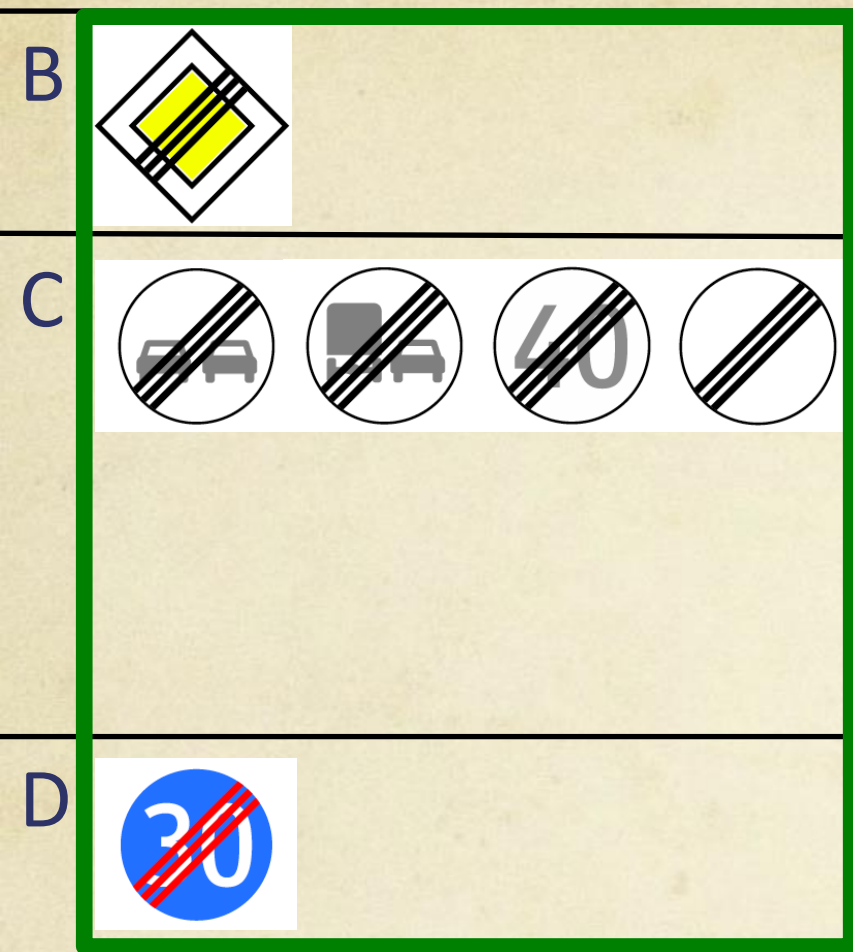
Primary, 2

- Always use Bar superimposed on a symbol or text.
- General use of 45° angle for all End-Of signs which are not rectangular (sections B, C, D).

“End-Of”-Bar: Recommendations

Secondary (optional, section E only)

- Introduce ratios for sides of groups of rectangular End-Of signs in the convention, and depict them.
- Have all End-Of-Bars meet with the center line in a rectangular signs corner, except all E, 10 “Zones” signs, which should bear 45° Bars as related C signs to provide space for inscriptions (Zone, time, ..)



End-Of-Bar-angle: ■ 45° / ■ Format Groups: 2:3 - E10, E5b, E6b, E11b; x:y - E8b, E8c; 3:2 - E8a, E8d, E17b

“End-Of”-Bar: Attachment

At the end of this presentation, all iterations developed to generate the findings of this study are attached.

Thank you!

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The MOA Design Method
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