Drogi zaufania

Zwiększanie Potencjału
Na Rzecz Bezpieczeństwa Ruchu Drogowego

Building Road Safety Capacity

INFRASTRUKTURA I ŚRODOWISKO
NARODOWA STRATEGIA SPÓJNOŚCI

Generalna Dyrekcja Dróg Krajowych i Autostrad

UNIA EUROPEJSKA
EUROPEJSKI FUNDUSZ ROZWOJU REGIONALNEGO

Projekt współfinansowany przez Unię Europejską ze środków Europejskiego Funduszu Rozwoju Regionalnego w ramach Programu Operacyjnego Infrastruktura i Środowisko.

VMS HARMONIZATION WITHIN THE EASYWAY (EUROPEAN) PROGRAM

Antonio Lucas

(Directorate General of Traffic)

University of Zaragoza

Spain

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Contents

- Background: road signs and VMS in Europe 1968-2003
- The VMS (Mare Nostrum) framework: 2003-2013.
- Beginning: building up a working structure
  - Main outputs: Working Book, Deployment Guidelines, Empirical Studies, work at UNECE.
  - Main empirical trends: topographic pictograms, topological location, new pictograms, complex VMS
- Basic meanings for “VMS harmonization”: a) exchange, b) accommodation to current infrastructures, c) visual language
- Future: from words to (short) sentences
- Conclusion

Background: road signs and VMS in Europe 1968-2003

- **The Convention on Road Signs and Signals (1968 Convention) is the main promoter of road signs harmonization in the world. The majority of European countries have ratified the 1968 Convention**

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UNECE

56 RATIFICATIONS OF THE 1968 CONVENTION

37

19

Cuba

Morocco

Mongolia

Iran

Irak

Pakistan

India

Philipiness

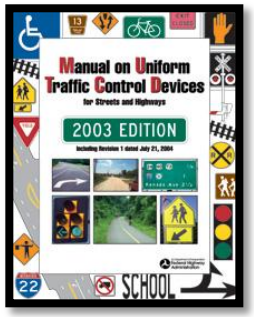
Chile

Centro African Republic

Democratic Republic of Congo

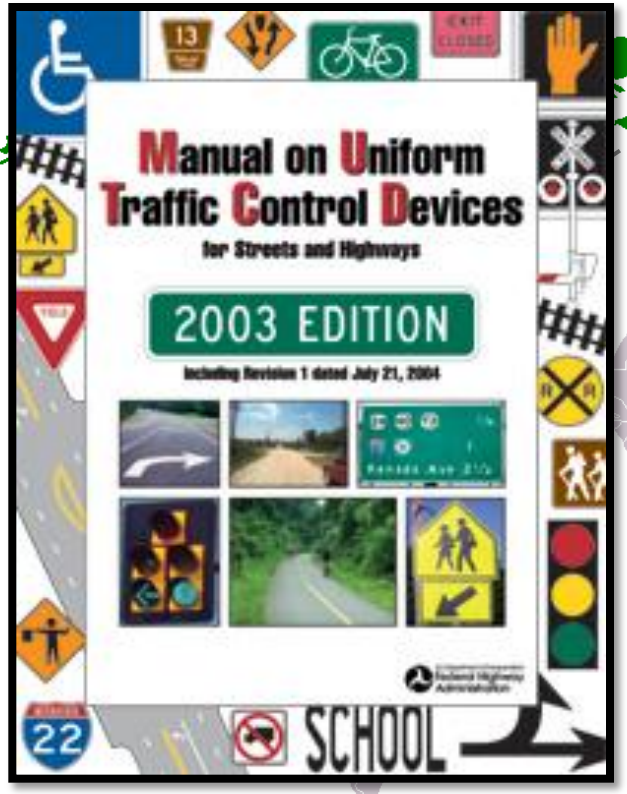
UNECE

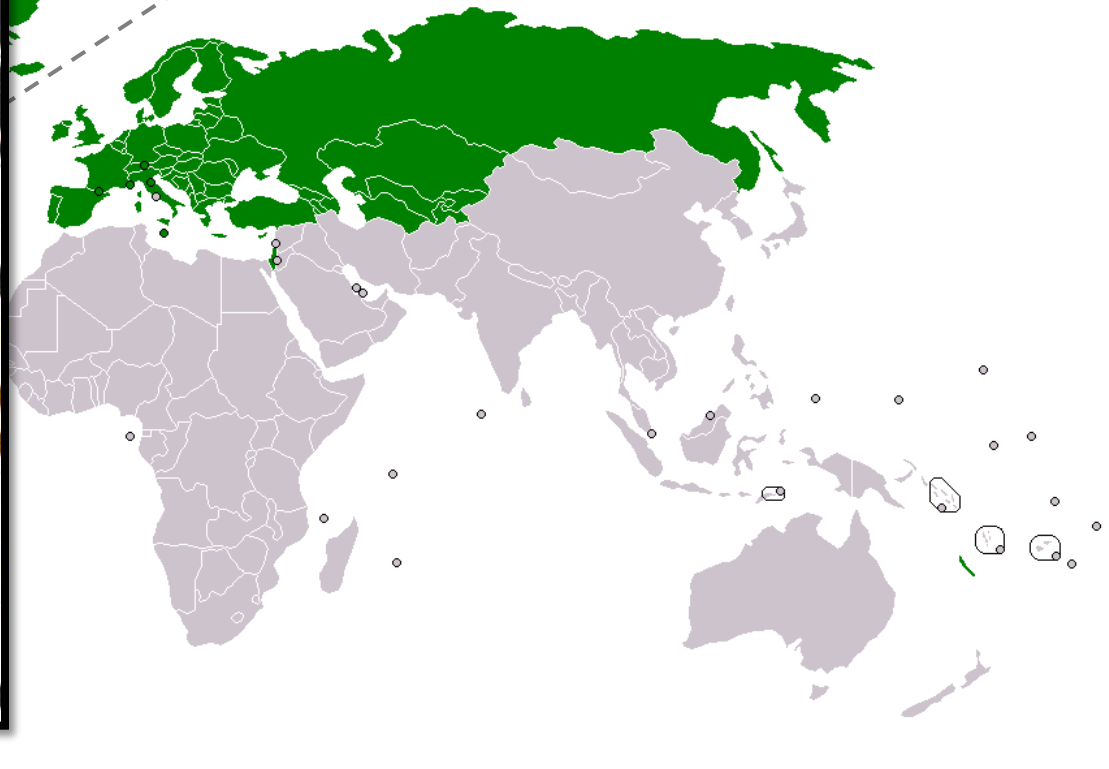
56 RATIFICATIONS OF THE 1968 CONVENTION



MUTCD

1968 C.





Background: road signs and VMS in Europe 1968-2003

- The Convention on Road Signs and Signals (1968 Convention) is the main promoter of road signs harmonization, at least in Europe. The majority of European countries have ratified the 1968 Convention
- **There is a semiotic structure concerning road signs shapes, colors, and design principles embedded within the 1968 Convention (Annex 3) that determine signing functions (danger warning, regulatory, informative), and a schematic, iconic design style**

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In search of common road signs - schematic and iconic

Touring club italiano
Italia 1905

German Imperial
Automobile Club, 1907

1909
First international convention

1926
International Convention

1931
Convention on the Standardization of Road Signs

League of Nations

1939
Project

1949
Protocol on Road Traffic Signs and Signals

1952
Project for a worldwide convention

United Nations

1968
International Conference for the Replacement of the Geneva Protocol

Vienna Convention

I International Convention
–Paris, 1909

Paris, 1926; Geneva, 1931

League of Nations Project, 1939; V.C. 1968

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- **But back in 1968, the Convention was mainly meant for fixed (posted) road signs, focused on road topography (dangerous bends, crossings, narrowing lanes, etc.). Signs we actually compensating for poor road development. However, in the 1970s changes went on under the COST umbrella: would not drivers benefit from "electronic aids"?**

Road conditions vs. road situations

Fixed-posted

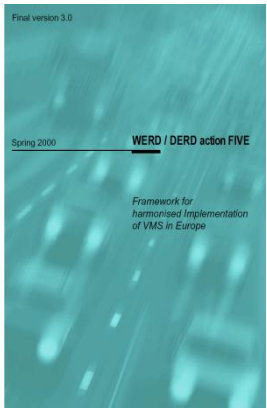
Direction/distance
Steep sections
Closed bends
Road narrowing
Road crossings
Others –wild life

Variable-VMS

Adherence
Traffic
Visibility
Wind
Availability
Itinerary
Other –ghost drivers

How to read the road
Pictogram selection
Message structure

Contemporary ITS & signing efforts



1971
European rules concerning road traffic signs and signals

1977-1980
COST 30

1991
VMS
"white book"

1994-1995
MELYSSA
EAVES…

1997
TELTEN2

1997-FIVE

1969
Aigrain Report

1970-1977
Project 30

1980-1985
COST 30 bis

1994
SETRA

1996-1999
TROPIC

2000-
European VMS Platform

EU Framework Programmes

Background: road signs and VMS in Europe 1968-2003

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- **Along the 1980s (e.g., COST30 Bis, 1985) the basic idea concerning VMS design was a) harmonize contents, without b) standardizing display devices (let industry be free). LED (*Light Emitting Diodes*) were expensive, integrating VMS was costly. The iconicity principle, the idea of a visual language for road signs was changed into the “Pictogram-Words VMS”.**

Hybrid signage

BUT ROAD SIGNS ARE

CONTENT ELEMENTS

- PICTOGRAMS (SYMBOLS)
- ABSTRACT ALPHANUMERIC
- NUMBERS
- TEXT INSCRIPTIONS

x

- KEEPING AN INTEGRATED, "READABLE" ORDER BETWEEN THEM

X

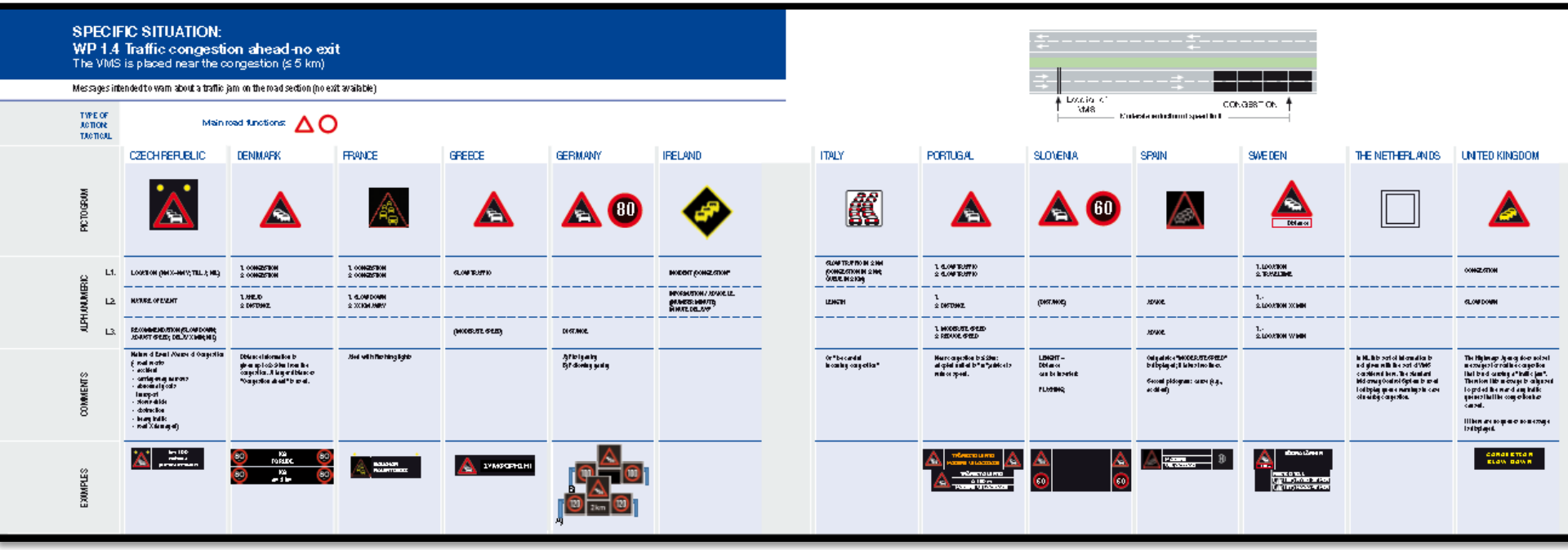
DISPLAY POSSIBILITIES

- PAINT COAT
- FULL MATRIX LED
- COMBINED HIGH (symbol) AND LOW RESOLUTION (text, inscriptions) LED
- LOW RESOLUTION LED (*text only*)

The VMS (Mare Nostrum) framework: 2003-2013.

- It begun in 2003 with 3 countries (FR, IT, ES) cooperating under the Euro-regional umbrella of ITS implementation. In 2004 NL entered.
- Then some other countries joined, particularly during the EasyWay frame (2007-2012): CZ, DK, DE, GR, HU, IR, PT, SL, SE, UK. The group then turned into a fully recognized horizontal European activity: ES4 (European Study 4), ESG4 (European Expert and Study Group 4).
- We have constituted a working structure around 4 main tasks:
  1. **Sharing what we do at home**

“Working Book” (2006, 2009, 2011)



13 countries, 54 road/traffic situations

Main convergences and divergences in order to harmonise VMS

Laboratory of signing ideas

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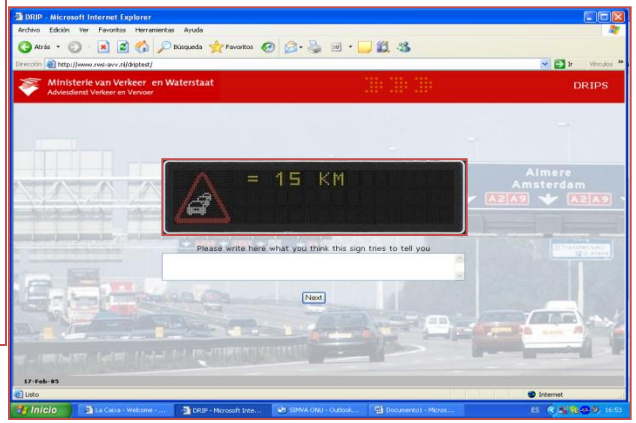
  2. **Solving issues empirically**

Empirical tests: 4-steps

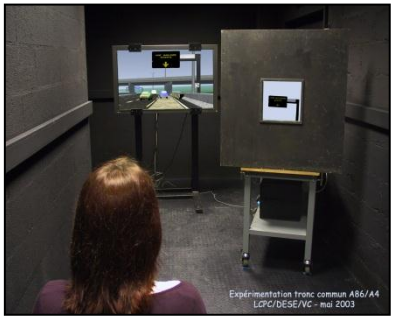
Estimated Comprehension

1



Comprehension Test

2



Laboratory t-scope technique

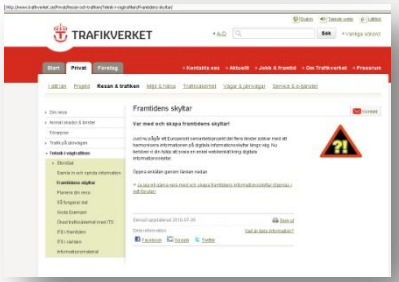
3

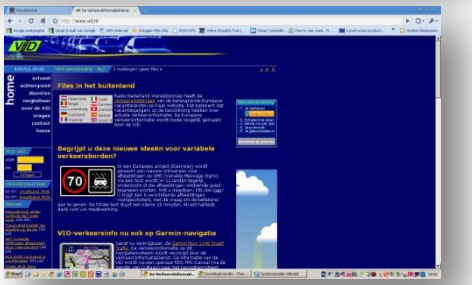
Field tests

4


Welcome to the Highways Agency

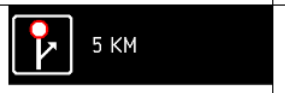
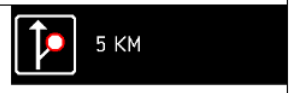

TRAFIKKEN.DK


TRAFIKVERKET



European Web Test of Traffic Signs (EWOTS)

2011 (12 countries; 10,308 drivers)

	SET 1	SET 2	SET 3	SET 4	SET 5	SET 6
REF 1						
REF 2						
REF 3						
REF 4						
REF 5						
REF 6						
REF 7						
REF 8						

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  2. Solving issues empirically
  3. **Developing Deployment Guidelines**

Deployment Guidelines (2009-2012)

- 32 design principles
- Five main issues:
  1. Considerations for operators before using VMS
  2. The use of pictograms on VMS
  3. The use of alphanumeric elements on VMS
  4. Strategies to locate road/traffic events
  5. The use of regulatory messages

The VMS (Mare Nostrum) framework: 2003-2013.

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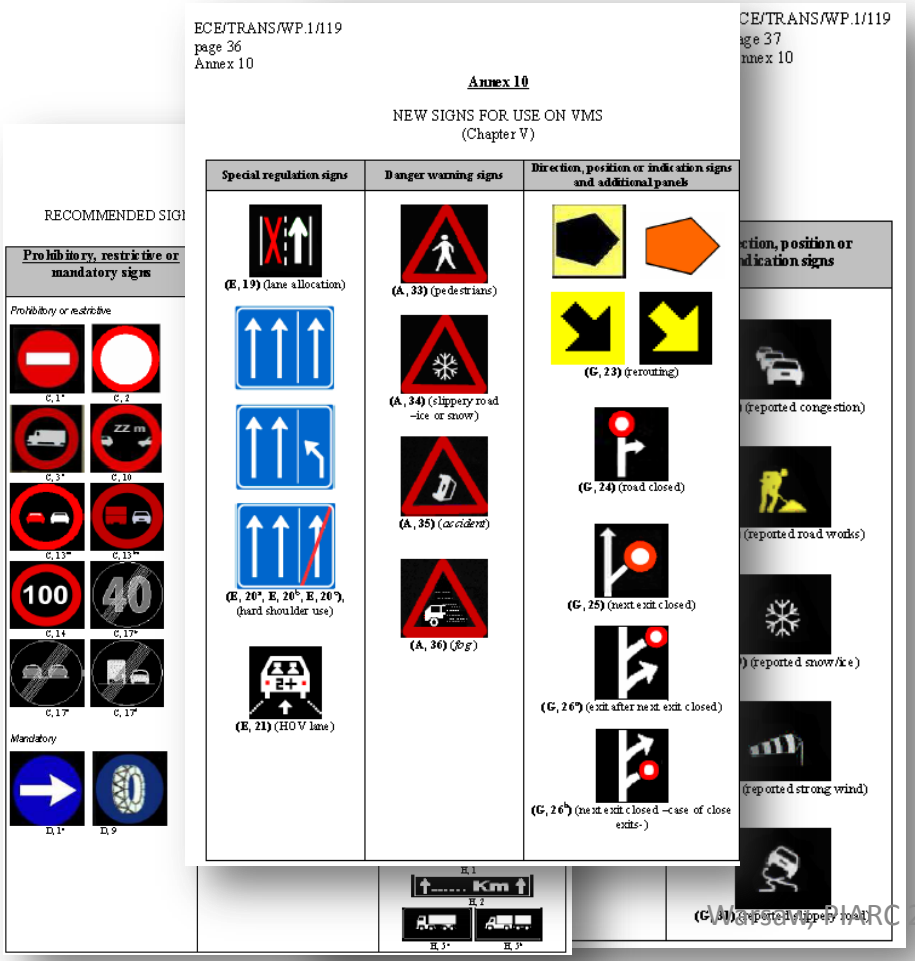
  3. Developing Deployment Guidelines
  4. **Promoting updates at WP.1 (UNECE) level**

AD HOC GROUPS CONCERNING VMS HARMONIZATION AND UPDATES OF 1968 CONVENTION (2003-2013)

“Small Group on VMS” (2003-2008): R.E.2.



ECE/TRANS/WP.1/119
page 36
Annex 10

Annex 10

NEW SIGNS FOR USE ON VMS
(Chapter V)

Special regulation signs	Danger warning signs	Direction, position or indication signs and additional panels
(E, 19) (lane allocation)	(A, 33) (pedestrians)	(G, 23) (rerouting)
(E, 20[a], E, 20[b], E, 20[c]), (hard shoulder use)	(A, 34) (slippery road –ice or snow)	(G, 24) (road closed)
(E, 21) (HOV lane)	(A, 35) (accident)	(G, 25) (next exit closed)
	(A, 36) (fog)	(G, 26[a]) (exit after next exit closed)
		(G, 26[b]) (next exit closed –case of close exits-)

RECOMMENDED SIGI

Prohibitory, restrictive or mandatory signs

Prohibitory or restrictive

C, 1[a] C, 2 C, 3[a] C, 10 C, 13[a] C, 13[b] C, 14 C, 17[a] C, 17[b] C, 17[c]

Mandatory

D, 1[a] D, 9

H, 1 Km H, 2 H, 3[a] H, 3[b]

ECE/TRANS/WP.1/119
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nnex 10

ction, position or dication signs

(reported congestion)

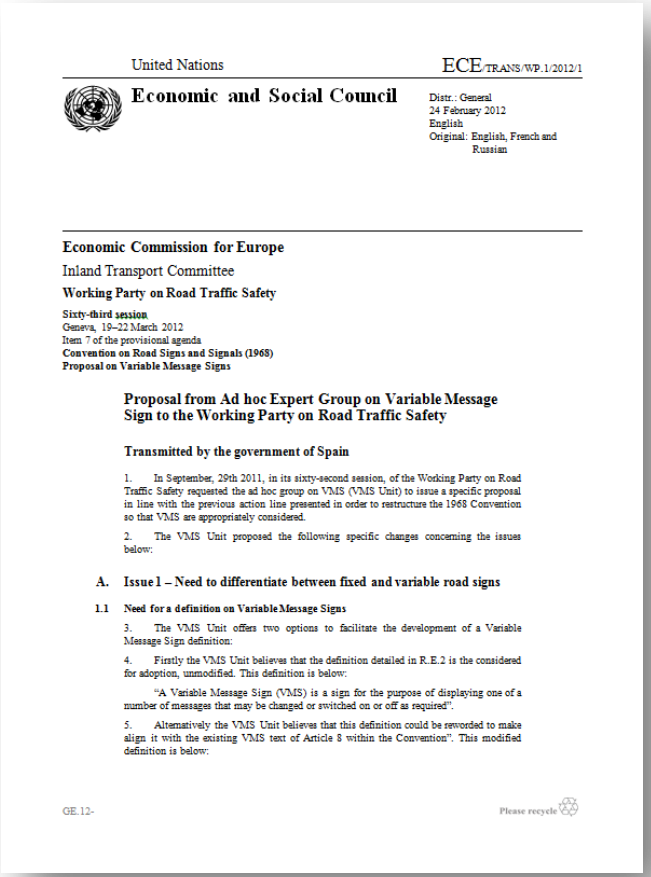
(reported road works)

(reported snow/ice)

(reported strong wind)

(G, 31) (reported slippery road)

“VMS Unit” (2009-…): real room for VMS within the 1968 VC



United Nations ECE/TRANS/WP.1/2012/1

Economic and Social Council

Distr.: General
24 February 2012
English
Original: English, French and Russian

Economic Commission for Europe

Inland Transport Committee

Working Party on Road Traffic Safety

Sixty-third session
Geneva, 19–22 March 2012
Item 7 of the provisional agenda
Convention on Road Signs and Signals (1968)
Proposal on Variable Message Signs

Proposal from Ad hoc Expert Group on Variable Message Sign to the Working Party on Road Traffic Safety

Transmitted by the government of Spain

1. In September, 29th 2011, in its sixty-second session, of the Working Party on Road Traffic Safety requested the ad hoc group on VMS (VMS Unit) to issue a specific proposal in line with the previous action line presented in order to restructure the 1968 Convention so that VMS are appropriately considered.

2. The VMS Unit proposed the following specific changes concerning the issues below:

A. Issue 1 – Need to differentiate between fixed and variable road signs

1.1 Need for a definition on Variable Message Signs

3. The VMS Unit offers two options to facilitate the development of a Variable Message Sign definition:

4. Firstly the VMS Unit believes that the definition detailed in R.E.2 is the considered for adoption, unmodified. This definition is below:

“A Variable Message Sign (VMS) is a sign for the purpose of displaying one of a number of messages that may be changed or switched on or off as required”.

5. Alternatively the VMS Unit believes that this definition could be reworded to make align it with the existing VMS text of Article 8 within the Convention”. This modified definition is below:

GE.12- Please recycle

Main empirical enquiries

- **Removing the red triangle**

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Removing the red triangle: comprehension and “danger”

32.6%	33.9%	55.7%	56.5%
94.4%	99.0%	96.8%	93.4%

99.1%	89.8%	93.7%	90.2%
7.3%	3.2%	14.9%	14.7%

Main empirical enquiries

- Removing the red triangle
- **Topographical pictograms**

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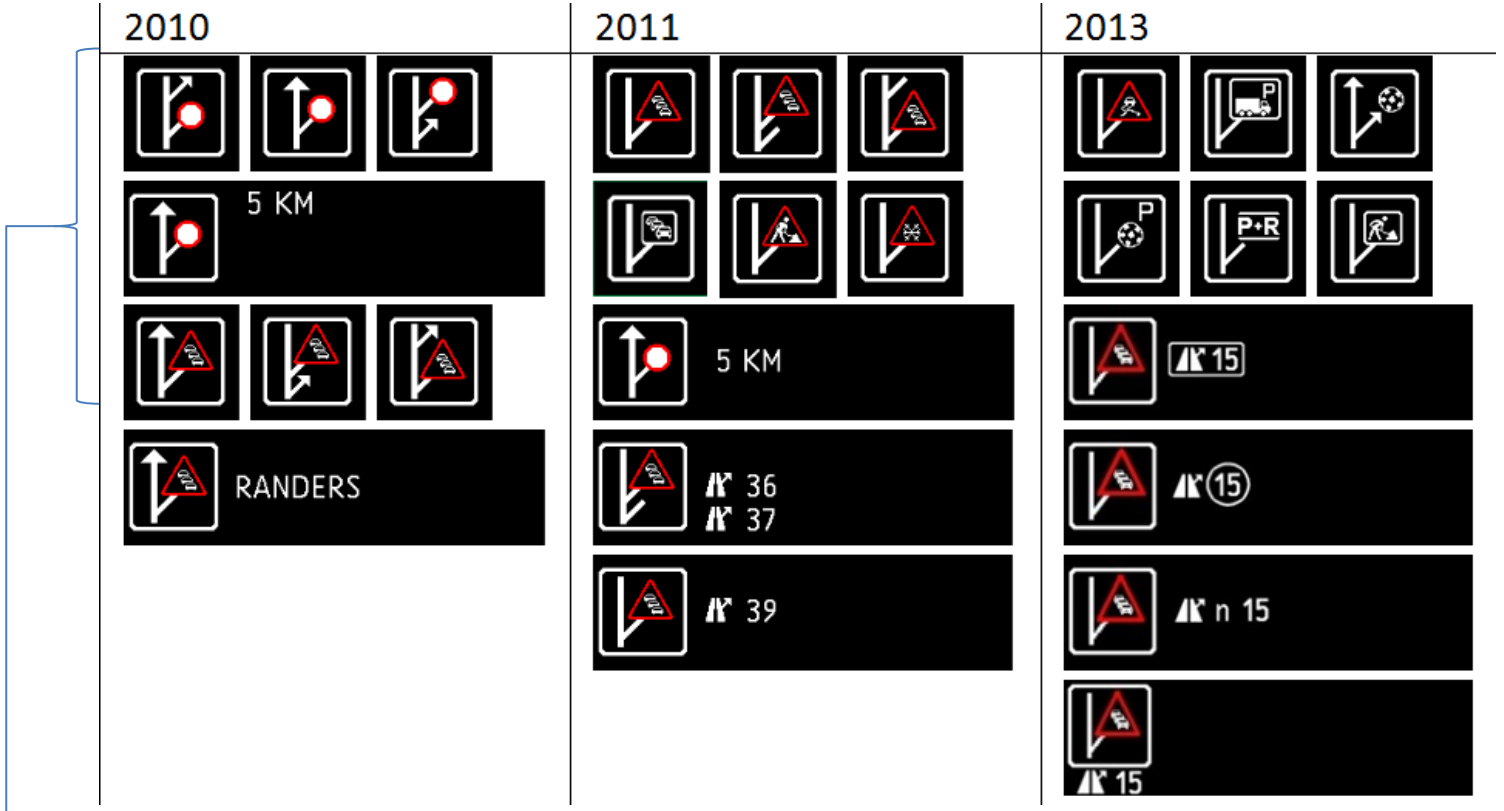
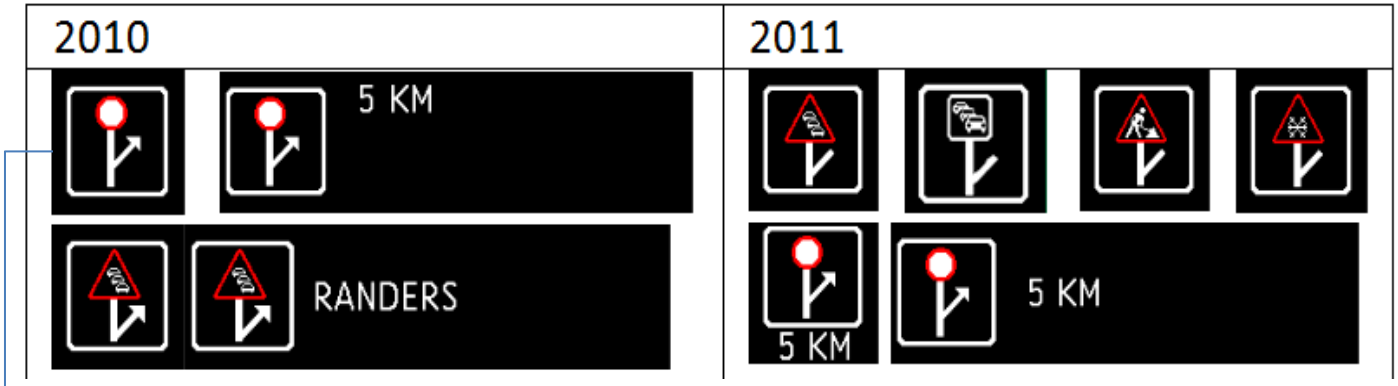
Topographical pictograms: events at exit



The simple ones well above 66% (ISO standard)

Topographical pictograms: events at main trunk



Just the regulatory, simple one above 66% (ISO standard)

Main empirical enquiries

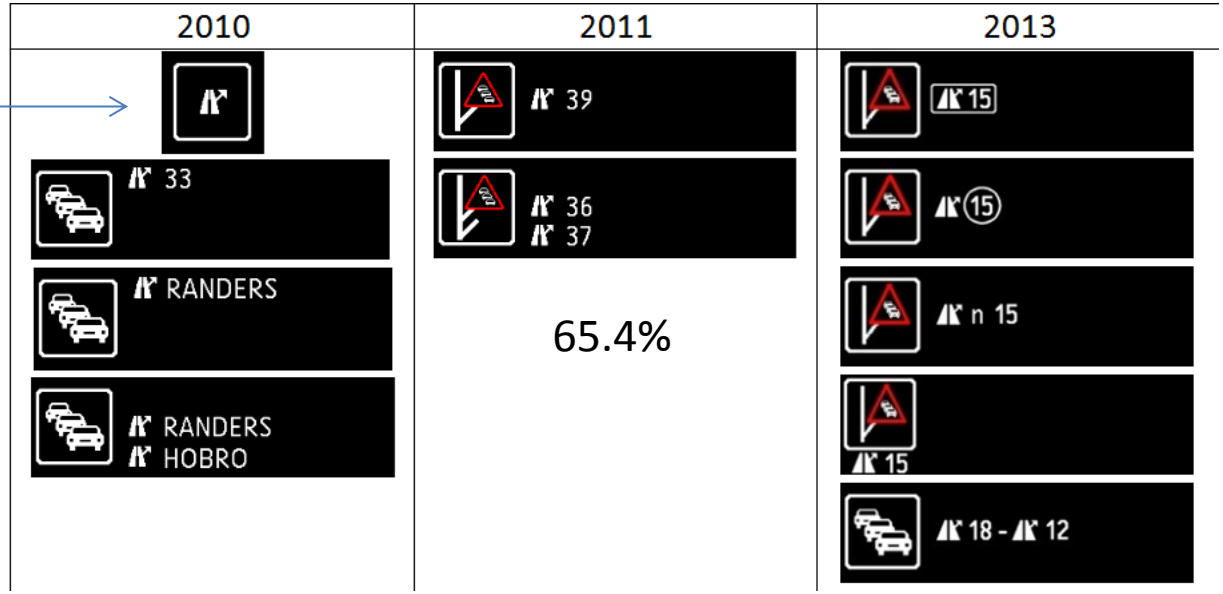
- Removing the red triangle
- Topographical pictograms
- **Exit**

Projekt współfinansowany przez Unię Europejską ze środków Europejskiego Funduszu Rozwoju Regionalnego w ramach Programu Operacyjnego Infrastruktura i Środowisko.

Exit

65.7%

76.6%


2010
2011
2013
33
RANDERS
RANDERS
HOBRO
39
36
37
65.4%
15
15
n 15
15
18 - 12

Main empirical enquiries

- Removing the red triangle
- Topographical pictograms
- Exit
- **Miscellanea**

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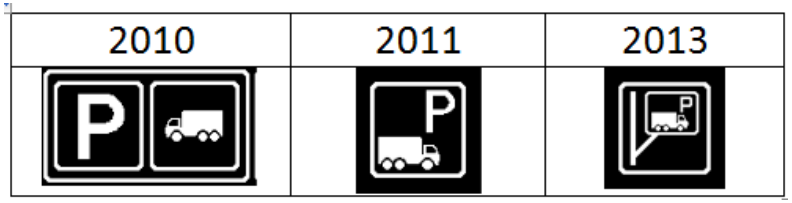
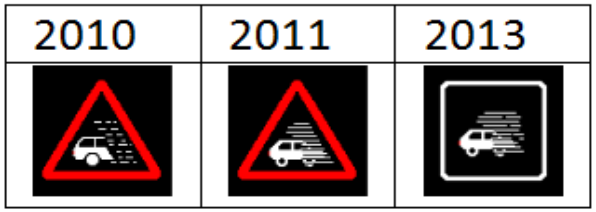
Miscellanea

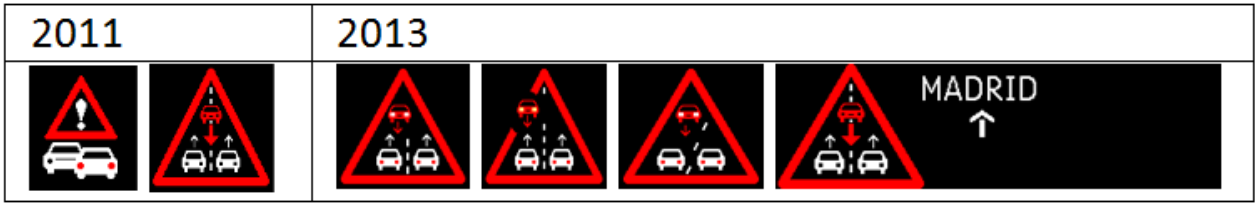
94.6% 94.7%



51.9% 70.7%

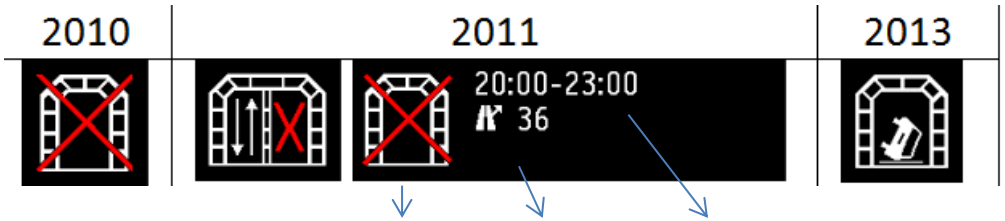


5.1% 66.0%



76.5%

71.0% 68.6% 45.8%



83.7% 51.5% 86.4%

Main empirical enquiries

- Removing the red triangle
- Topographical pictograms
- Exit
- Miscellanea
- **Coupling pictograms: truck-parking, rain-speed limit, fog-speed limit**

Projekt współfinansowany przez Unię Europejską ze środków Europejskiego Funduszu Rozwoju Regionalnego w ramach Programu Operacyjnego Infrastruktura i Środowisko.

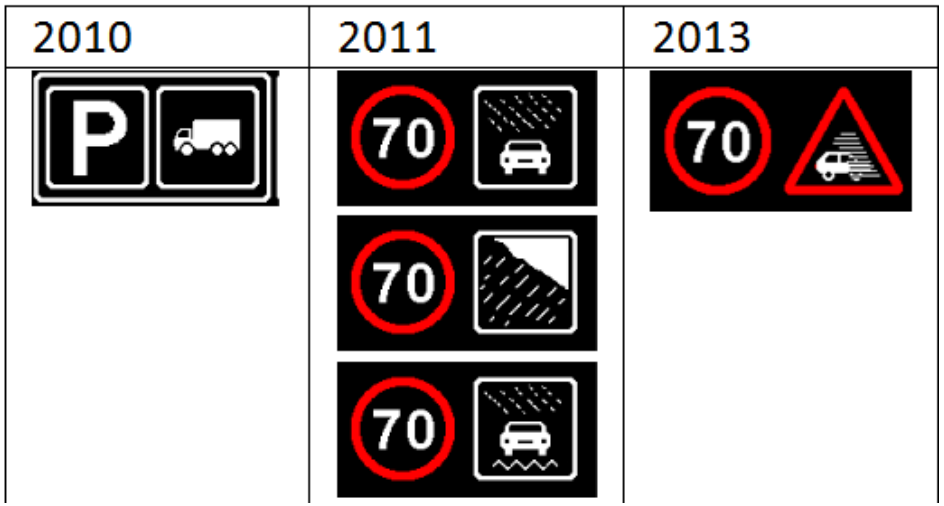
Coupling pictograms

88.1%

85.4%

82.5%

94.6%



Main empirical enquiries

- Removing the red triangle
- Topographical pictograms
- Exit
- Miscellanea
- Coupling pictograms: truck-parking, rain-speed limit, fog-speed limit
- **Events location: between A and B, up to A, after B**

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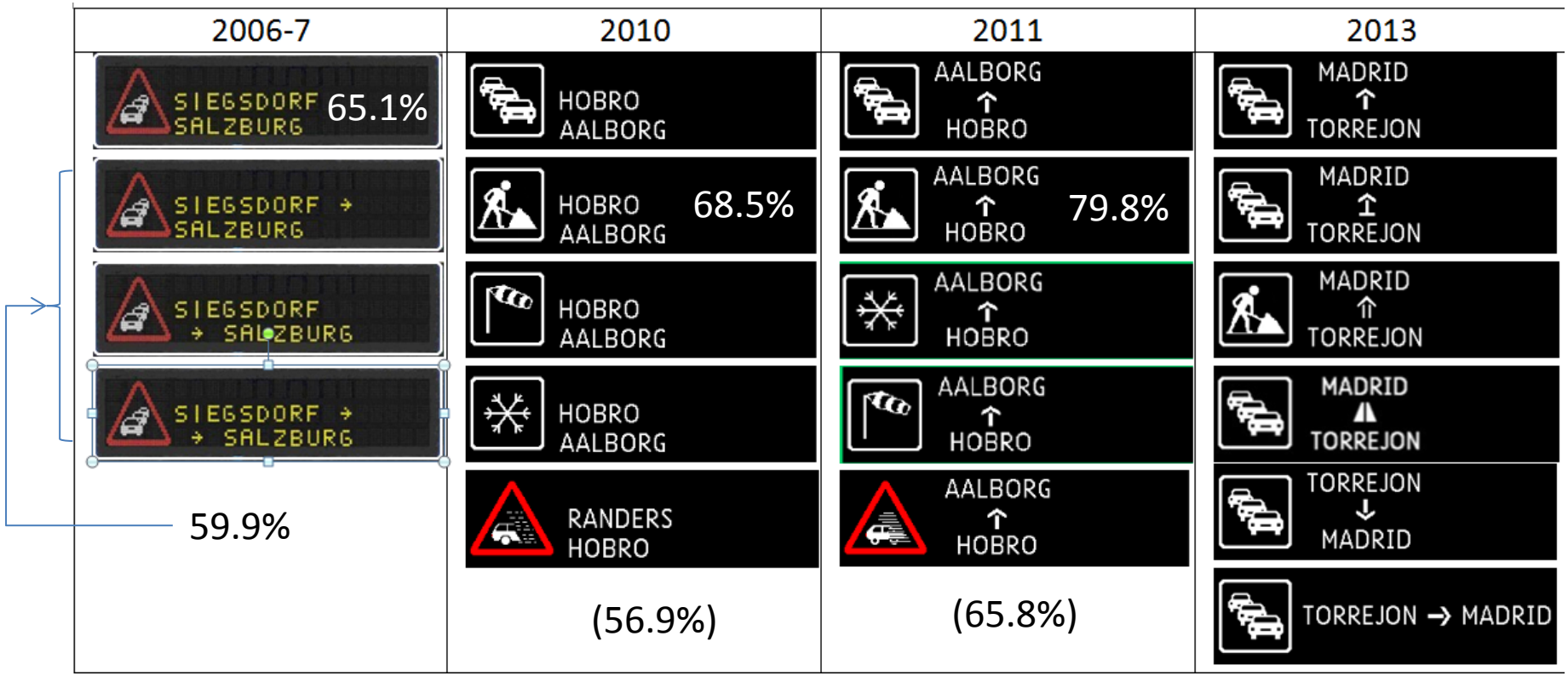
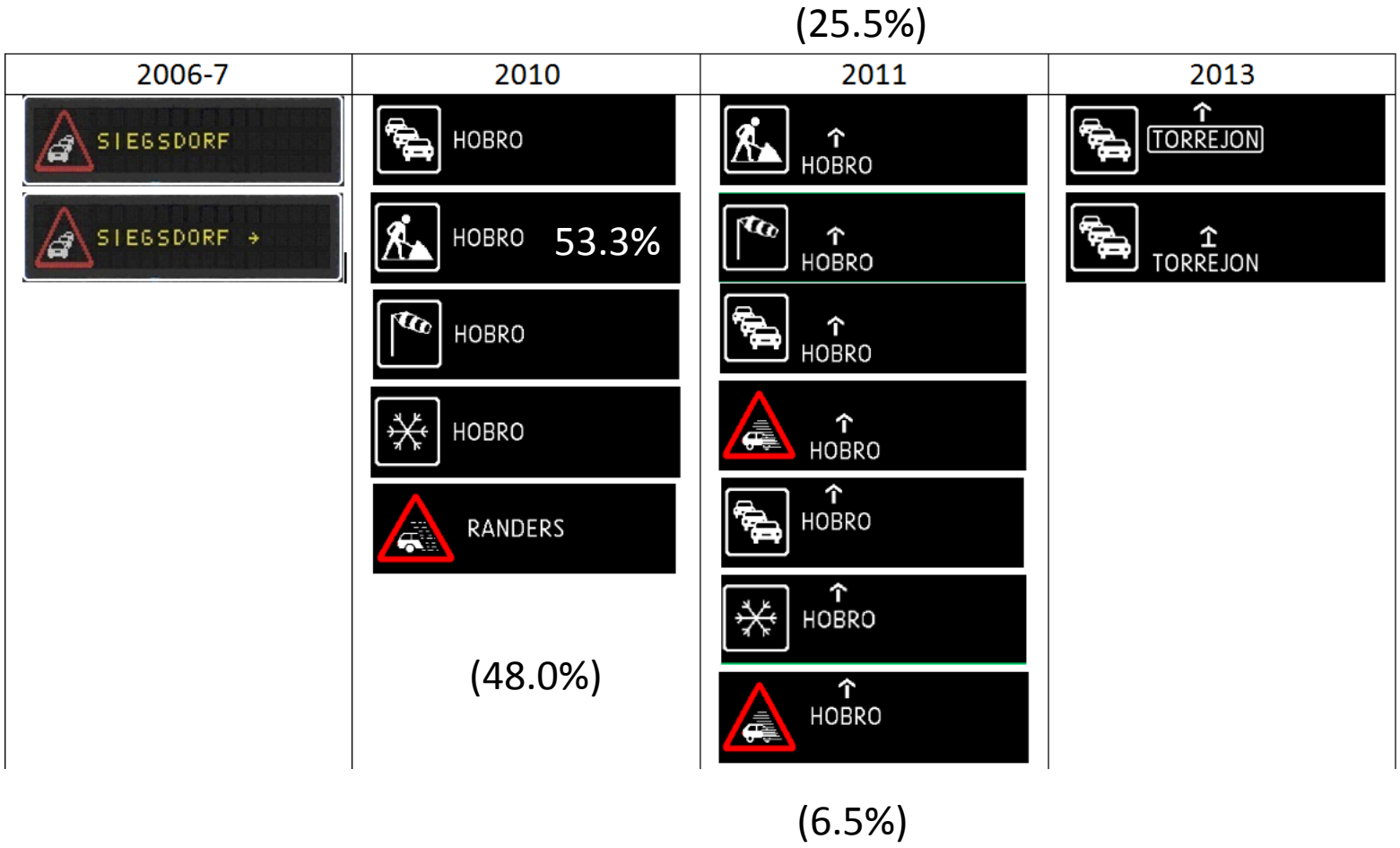
Event location: between A and B



Event location: up to A

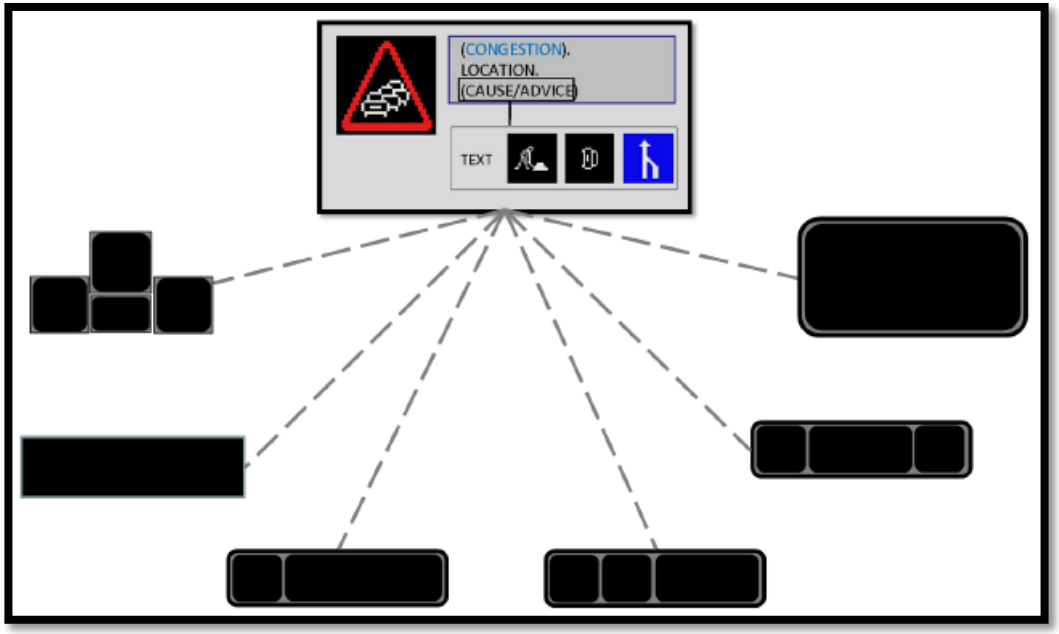
2006-7	2010	2011	2013
			
56.5%		 80.8%	
			
			
	(39.1%)	(66.9%)	

Event location: after B



Basic meanings for VMS harmonization

1. Pure exchange of prerogatives
2. Accommodation to current display devices: feasibility



3. Visual and iconic language

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Communication: verbal, visual

- Languages are meant for communicating
- Languages convey meaning in differing ways
- Verbal languages:
  - **Semantics**: meaning comes from words (*morphemes*)
  - **Syntax**: meaning comes from the way words are ordered with each other (*order within the sentence*)
  - **Pragmatics**: sentences makes sense within a given place and moment *(context)*

Communication: verbal, visual

VERBAL LANGUAGES (English)

- Words, morphemes
- Short sentences
- Conversation (context)

VISUAL LANGUAGES (Road Signs)

- Pictograms, alphanumeric signs, shapes, colors
- Variable message signs, road panels
- Driver reads road signs

Communication: verbal, visual

VERBAL LANGUAGES (English)

- “Dangerous congestion” (adjective + noun)

VISUAL LANGUAGES (Road Signs)

(red frame + icon)

94.4%

- “Road works (located) on the way to Aalborg”

80.8%

Road signs: simple and complex

Simple road signs
(words, noun phrase)

Complex road signs

(short sentences)

PICTOGRAMS

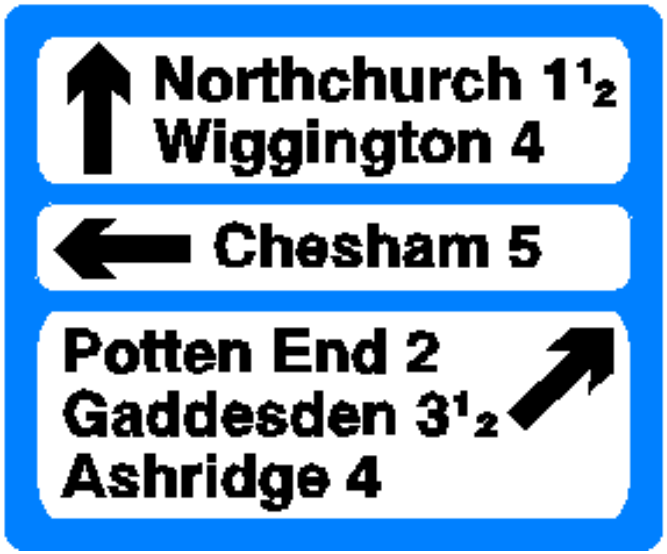
ROAD PANNELS
VARIABLE MESSAGE SIGNS

1995 (official)

2011 (in progress)

Complex road signs: posted and variable

The model (1968 VC)



Direction
Location

VMS (topological location)

Direction
Location
Variable event

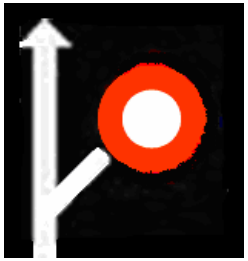
Sagunto	70
Valencia	93
Castellon	101

Concluding

What you read first, comes first

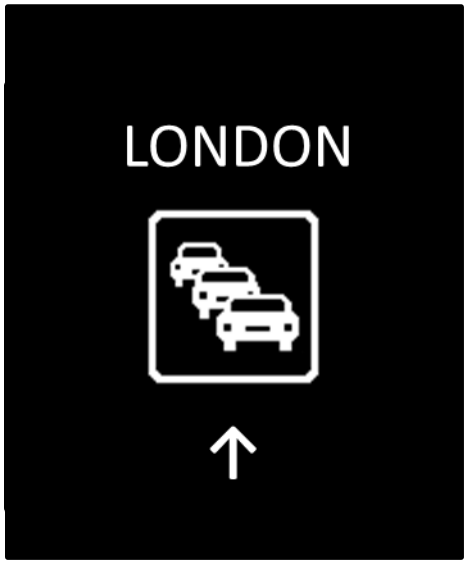
The location at the bottom comes first

"left is left and right is right"

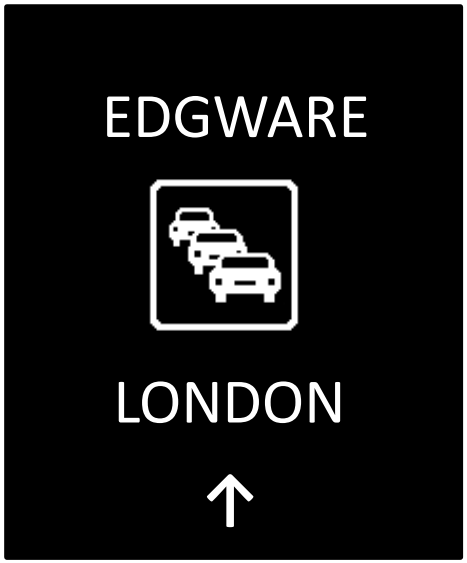


Complex road signs: spatial syntax for iconic communication

Event up to A



Event from A to B



Event after A

HAITZ'S LAW: 7 YEARS TO GO

Thanks for your attention

Any question

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