Zwiększanie Potencjału
Na Rzecz Bezpieczeństwa Ruchu Drogowego

Building Road Safety Capacity
VMS HARMONIZATION WITHIN THE EASYWAY (EUROPEAN) PROGRAM

Antonio Lucas
(Directorate General of Traffic)
University of Zaragoza
Spain
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  – Main empirical trends: topographic pictograms, topological location, new pictograms, complex VMS
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• 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
UNECE

56 RATIFICATIONS OF THE 1968 CONVENTION

Warsaw, PIARC 2013. October 3rd
UNECE

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Warsaw, PIARC 2013. October 3rd
Background: road signs and VMS in Europe 1968-2003

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• 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
In search of common road signs - schematic and iconic

1909
First international convention

1926
International Convention

1931
Convention on the Standardization of Road Signs

1939
Project

1949
Protocol on Road Traffic Signs and Signals

1952
Project

1968
International Conference for the Replacement of the Geneva Protocol

1909
League of Nations

1931
Touring club italiano

1926
Kaiserlicher Automobil Club

1949
German Imperial Automobile Club, 1907

1952
United Nations

1968
Vienna Convention

International Convention - Paris, 1909

Paris, 1926; Geneva, 1931

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

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Contemporary ITS & signing efforts

1971
European rules concerning road traffic signs and signals

1977-1980
COST 30

1980-1985
COST 30 bis

1989
VMS “white book”

1991

1994-1995
MELYSSA 1997

1996-1999
TROPIC

2000-
European VMS Platform

1969
Aigrain Report

1970-1977
Project 30

1977-1980
COST 30

1994-1995
MELYSSA 1997

1996-1999
TROPIC

2000-
European VMS Platform

EU Framework Programmes
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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

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**BUT ROAD SIGNS ARE**

<table>
<thead>
<tr>
<th>CONTENT ELEMENTS</th>
<th>DISPLAY POSSIBILITIES</th>
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<tr>
<td>• PICTOGRAMS (SYMBOLS)</td>
<td>• PAINT COAT</td>
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<td>• ABSTRACT ALPHANUMERIC</td>
<td>• FULL MATRIX LED</td>
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<td>• NUMBERS</td>
<td>• COMBINED HIGH (symbol) AND LOW RESOLUTION (text, inscriptions) LED</td>
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<td>• TEXT INSCRIPTIONS</td>
<td>• LOW RESOLUTION LED (text only)</td>
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<td>• KEEPING AN INTEGRATED, “READABLE” ORDER BETWEEN THEM</td>
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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
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

1. Estimated Comprehension Test
2. Comprehension Test
3. Laboratory t-scope technique
4. Field tests

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European Web Test of Traffic Signs (EWOTS)
# 2011 (12 countries; 10,308 drivers)

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<th>REF 1</th>
<th>SET 1</th>
<th>AALBORG → HOBRO - 10 KM</th>
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<th>AALBORG → HOBRO</th>
<th>SET 4</th>
<th>AALBORG → HOBRO 5-6 JUNI</th>
<th>SET 5</th>
<th>AALBORG → HOBRO + 15 MIN</th>
<th>SET 6</th>
<th>AALBORG → HOBRO + 15 MIN</th>
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• We have constituted a working structure around 4 main tasks:
  1. Sharing what we do at home
  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
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- We have constituted a working structure around 4 main tasks:
  1. Sharing what we do at home
  2. Solving issues empirically
  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)


“VMS Unit” (2009-...): real room for VMS within the 1968 VC
Main empirical enquiries

• Removing the red triangle
Removing the red triangle: comprehension and “danger”

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Main empirical enquiries

- Removing the red triangle
- Topographical pictograms
Topographical pictograms: events at exit

2010

- 5 KM
- RANDERS

2011

- 5 KM
- $^* 36$
- $^* 37$
- $^* 39$

2013

- $^* 15$
- $^* n 15$
- $^* 15$

The simple ones well above 66% (ISO standard)

Warsaw, PIARC 2013. October 3rd
Topographical pictograms: events at main trunk

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<tr>
<th>2010</th>
<th>2011</th>
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<tr>
<td><img src="image5" alt="Pictogram 5" /></td>
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Just the regulatory, simple one above 66% (ISO standard)

Warsaw, PIARC 2013. October 3rd
Main empirical enquiries

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

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
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</tbody>
</table>

- **2010**: 76.6%
- **2011**: 65.7%
- **2013**: 65.4%

Warsaw, PIARC 2013. October 3rd
Main empirical enquiries

• Removing the red triangle
• Topographical pictograms
• Exit
• Miscellanea
Miscellanea

<table>
<thead>
<tr>
<th>2010</th>
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Warsaw, PIARC 2013. October 3rd
Main empirical enquiries

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

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
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<td><img src="image2.png" alt="Pictogram" /></td>
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88.1%
85.4%
82.5%
94.6%

Warsaw, PIARC 2013. October 3rd
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
## Event location: between A and B

<table>
<thead>
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<th>Year</th>
<th>Location</th>
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<th>Location</th>
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<td>65.1%</td>
<td>HOBRO AALBORG</td>
<td>68.5%</td>
<td>AALBORG</td>
<td>79.8%</td>
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Warsaw, PIARC 2013. October 3rd
# Event location: up to A

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<th>2006-7</th>
<th>2010</th>
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<td>68.5%</td>
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(39.1%)
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<td><img src="image" alt="Sign: HOBERO" /></td>
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<td><img src="image" alt="Sign: HOBRO" /> 53.3%</td>
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(53.3%) (48.0%) (25.5%) (6.5%)
Basic meanings for VMS harmonization

1. Pure exchange of prerogatives
2. Accommodation to current display devices: feasibility
3. Visual and iconic language
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)

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

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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)

VMS (topological location)

Direction
Location

Direction
Location
Variable event
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
lucalba@unizar.es