ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

<u>Working Party on Road Traffic Safety</u>
(Forty-fifth session, 27-30 September 2004,
agenda item 5 (j)

**REVISION OF THE CONSOLIDATED RESOLUTIONS ON ROAD TRAFFIC (R.E.1)
AND ON ROAD SIGNS AND SIGNALS (R.E.2)**

Variable Message Signs (VMS)

<u>Note by the small group</u>

INTRODUCTION

Through the so-called globalisation process, recent decades have seen an increase in the mobility of people and goods, following different political openings, as well as in economic and commercial transactions worldwide. Clearly, such global trends require increased communication and transport, including by road.

The road transport system has experienced a massive expansion throughout the twentieth century, going from about 100,000 vehicles in 1900, to more than 500 million vehicles in the late 1990s. Both developed and developing countries are in need of improved road mobility schemes. Motorised transport is, undoubtedly, a key component of today's global transport: millions of drivers follow daily their paths to many destinations, and need useful road information in order to be able to carry out orderly interactions on the road network.

Indeed, public and private road actors early foresaw considerably simpler, but similar circumstances. In 1909, the first international convention on road signs was organized in Paris. The first four common road signs were standardized then and it was the germ of a series of conventions, protocols, and projects, originally under the supervision of the League of Nations, then the United Nations, that would end in the 1968 Convention ('Vienna Convention'), a milestone in international road signing and the basic tool for international traffic harmonization.

During the 1970s and the 1980s, technological innovations in the field of road information have developed. As a result, in addition to traditional posted signs, two new sign presentation systems have emerged: variable message signs (VMS) and in-vehicle systems, the former being quite widespread on our roads. Consequently, the need for harmonised road displays has become even more acute today, in order to avoid divergent road information that may produce cognitive overload, misunderstanding, bewilderment or non-compliance on the part of drivers, both national and international.

The present proposal will focus on VMS, widely implemented road information devices, that make road information public. The basis of this proposal will follow the Framework for Harmonised Implementation of VMS in Europe, commonly known as 'FIVE' (FIVE-WERD/DERD, 2000). FIVE incorporates a set of recommendations that draw on information derived from scientific and technical documents elaborated by different European projects and relevant VMS publications in the late 1980s and throughout the 1990s.

On 22 September 2003, the 43rd session of the Working Party on Road Traffic signalled VMS, among other road signing issues, as a road issue deserving more attention. Several countries such as France, Germany, Netherlands and Spain, among others, took that line. A document was presented that showed VMS as a relatively heterogeneous system of road signs worldwide. During the last 20 years, VMS have been subject to pressures resulting from accelerating influences (scientific and technical developments, emerging layout and display possibilities) as well as slowing ones (harmonizing, legal and administrative changes to national road codes).

Europe is a clear example of pervasive VMS heterogeneity, in spite of the applied research, harmonization and implementation efforts within the R and D domain (TELTEN and TROPIC approaches), or the main European regional projects. Just to name a few important issues, the European area offers considerable variations in terms of the elements used (pictograms, alphanumeric), combinations used (which information goes to text or to pictogram), or the relationship sign-event (i.e. the way road situations are interpreted by operators and VMS are built accordingly).

On 10 June 2004, representatives of France, Germany, Netherlands and Spain, held a meeting in Madrid to agree on the problems they have to face and solve in day-to-day VMS operation. The main goal of the group is to work on signing proposals that follow the spirit (content, structure and functions) of the 1968 Convention, hence *bringing road signs* –traditional and VMS - *closer*. The 1968 Convention catalogue represents nearly a century of careful work on road sign development, and deserves every consideration. Pictograms should be central to VMS use, text should be minimised, and abbreviations should be international, etc. The group considered the specific characteristics of VMS devices, particularly the versatile M-VMS (Multipurpose VMS or 'pictogram + text' VMS), widely used in Europe and other places in the world and drew on shared national experience and relevant documents on VMS issues to identify road signs that should be improved as well as road situations that could be depicted in new road signs.

Recommendations

The authorities of the June 2004 working group strongly recommended harmonising the uses and messages displayed through VMS. In line with this aim, two simple, quite general proposals emerged that could initiate the improvement of the situation:

(a)   To CONSOLIDATE THE RELEVANCE OF OFFICIAL (Vienna Convention - VC) PICTOGRAMS, both in national and international VMS networks; the need to adopt a common stance on pictogram selection, giving priority to consequence-oriented pictograms;

(b)   To ANTICIPATE how forthcoming TECHNICAL DEVELOPMENTS (e.g. GRIP, motion pictograms) could affect VMS, and which ones could be introduced using the current VC catalogue as the main reference.

In addition to these general proposals, some other more specific issues must be addressed:

(c)   NEW PICTOGRAMS AGREEMENT. It is absolutely necessary to pay more attention to pictograms relating events or situations (e.g. traffic conditions, weather conditions, and other hazardous circumstances). The COST 30 group designed several danger warning signs. Some of them have been adopted with slight differences by countries (e.g. congestion), some are difficult to understand and need to be redesigned (e.g. accident), some can be used in different situations (e.g. snow, black ice or slippery road). But many new needs have appeared recently and these circumstances should be addressed:

- Temporarily unavailable motorway hard shoulders, due to road works, accident, car breakdown, etc., cause pedestrian deaths every year;
- Ghost drivers (e.g. taking the wrong direction on a motorway), a new phenomenon, could be studied; particularly to determine what simple recommendation could be made;
- Similar examples are signs for fog, poor visibility, slippery road,
- Warning of salt spreaders or snow clearance vehicles in use ahead,
- Road congested, lane or road closed, exit recommended or mandatory,
- Reversible lane, hard shoulder opened temporarily to circulation or other dynamic lane management, etc.

In sum, it is proposed to revise the COST 30 signs and propose a list for approval by the UN and to consider new pictograms, necessary for the accomplishment of traffic management tasks, and incorporate them within the UN catalogue.

(d)   In addition to the previous, to REDUCE THE NUMBER OF VMS PICTOGRAMS and so, within the VMS road context, use only highly standardized pictograms;

(e)   COMMON "READING" AND VMS SIGNPOSTING PROCEDURE FOR ROAD SITUATIONS. Another VMS-related issue concerns the knowledge of road events that traffic managers have when activating VMS. Clearly, VMS selection depends on the accuracy of the road information operators have and how they read what is happening on the road (the "SITUATION").

Compare, for example,

- a situation where operators know exactly the point where road congestion begins (via TV cameras, loop detectors, etc.) so they can decide to display a regulatory VMS (speed) on a gantry located up to 2 km before the event, with

- the situation where operators know roughly about such point, they have been informed about an accident that produced congestion and hence, display a danger warning sign indicating congestion "ahead".

Clearly, VMS signposting depends on the accuracy (level) of the road information operators deal with and the situation that the operators have "read" or "understood".

Acknowledging this simple fact implies that:

1.   regulatory signs are not always convenient, and misuse of regulatory signs clearly leads towards a spoiling of both regulatory system and practice;

2.   when operators are not sure about what is happening on the road, danger warning or informative signs should be used instead, with some common rules that could be simply explained and understood by drivers;

3.   the different situations that might happen on the roads are common to all countries and not dependent on the road operators and human operators that read and understand the information received in traffic control centres. This situation should be agreed and marked with harmonised signposts (following VC rules). The common signposting procedure depends on the VMS infrastructure (Pictogram + Text, only Pictogram, only Text, etc).

From this point of view, the daily influence that the road information continuum exerts on VMS should be considered and endowed with an institutional position within UN. VMS operational and influence issues (TCC/TIC operators on VMS; VMS upon drivers) are clearly linked here.

(f)   PICTOGRAM + TEXT = ROAD SIGN. The VMS concept should completely shift from the idea "VMS = pictogram + text" that describes an event or a situation, to the idea "VMS = road sign" that informs or warns the drivers and the only one proposed to all users.

Currently, VMS composition is taken as a correspondence issue: there are *a, b, c …* pictograms and *y, z, x…* text portions, and VMS are obtained by merely matching previously stocked components.

On the contrary, to gain on homogeneity, VMS should be taken as a whole, i.e. considering that certain pictogram-text sequences are unique road signs that should be made official road signs within the UN. That would allow the understanding of VMS (including some text sequences) by any type of driver within any international and/or multilingual area.

'Sign' is a more generic concept than 'pictogram' or 'icon'. VMS are (complex) road signs. Some essential efforts have been made in that direction, notably the action FIVE approach. Too many 'degrees of freedom' remain, though, for information selection and placement. Road situations should be brought to a deeper and more concrete level, made explicit, and be matched to (nearly) fixed VMS designs (pictogram + text). The UN should define a unique and internationally harmonised way of combining pictogram + text to communicate the situations.

These six proposals can be summarized in the following working table:

VMS-informative parameters	VMS - main functions			
	Regulatory	Danger warning	Informative	Strategic
SITUATIONS [1] *Road adherence* *Road traffic* *Road wind* *Road visibility* *Road capacity* *Road itinerary*	Recommended set of regulatory messages (adapted to VMS infrastructure type).	General limitation on the amount of information used on VMS	Always display first event met by drivers on pictogram. Link and journey time messages	Network and re-routing messages
Message structure	Which information should be on what line -following FIVE structures. Consequence-oriented pictograms.			
Pictogram	- Standard Vienna Convention pictograms + new or redesigned pictograms; use of symbolic complementary plates			
Text codes	- Use of symbols that can be applied internationally (e.g. →, =, /)-			
Text structure	- Following FIVE standards (no more than 5-7 words), adapted to specific road function (short text, < 3 words for danger warning VMS).			

1.   Road situations concern the main variations on the road that can be made known via VMS. Road situations are organised following the Vienna Convention catalogue.

_____