INVITATION TO TENDER (ITT)

HOS/12/012 - Advertisement for Literature Review of Readability of UK Vehicle Registration Plates as a Function of Character Spacing

Background

The Home Office Centre for Applied Science and Technology invites expressions of interest for a study into the effects of the spacing between characters on the readability of the vehicle registration mark (VRM) on UK number plates by human observers and automatic number plate recognition (ANPR) systems.

In particular evidence is sought regarding whether non-standard character spacing as commonly found on 'cherished' plates affects the ability of ANPR systems to accurately read the plate, and also whether it affects human ability to read and remember the registration plate correctly, for example if witnessed at the scene of an accident.

The scope of this work includes an examination of both the spacing between individual characters and the spacing between distinct groups of characters as found on current UK VRMs. It is also relevant to examine whether ANPR performance / human readability is affected by an expectation that the characters will be grouped in a standard combination of numbers and letters (e.g. AB12 CDE or A123 BCD as per the UK standard). The current font and character size used on UK VRMs is prescribed in The Road Vehicles (Display of Registration Marks) Regulations 2001. Changes in font, character size and colour (of characters and background) are out of scope of this study.

This work will be divided into two work packages for human and ANPR dependencies. The task of both work packages will be to conduct comprehensive literature reviews of the effect of VRM character spacing on human observation, ANPR performance and measurement methodologies. Depending on the outcome from these literature reviews it is possible that this work will continue into experimental studies of any effects, where the Home Office may issue a further Invitation To Tender.

Formal bids are now invited from potential suppliers who would be able to deliver such literature reviews. The Home Office welcomes bids from academic groups and relevant research organisations. Owing to the distinct difference in the literature reviews tenders for each the individual work packages are encouraged. Bids from a consortia addressing the work packages individually or collectively are welcome.

Specification

Contents of the literature reviews must include:

Work package 1 – ANPR Performance:

1 Description of optical character recognition (OCR) techniques used in ANPR algorithms. This will relate to a number of commonly used ANPR systems as defined by CAST.

2 Identification of any part of the ANPR algorithms or optical system which may be affected by spacing variation, both above and below those stipulated in the Regulations.

3 Identification of any other factors, related to character spacing or non-standard arrangements of letters and numbers, which may affect the ANPR performance.

4 Effect of spacing between individual characters and between groups of characters on the read rate of these ANPR system.

5 Effect of related factors on any part of an ANPR system (character spacing and those identified in sub task 2).

6 Any statistics on the performance of ANPR systems against individual characters and the identification of any known problem characters, or groups of characters, that cause ANPR systems to commonly misread.

Reporting of any results to the above tasks should, where possible, be referenced to The Road Vehicles (Display of Registration Marks) Regulations 2001 and to BS AU 145d: 1998 – Specification for Retroreflecting Number Plates.

A formal report is required to be delivered to CAST on agreed timescales stating results of a literature review addressing the issues above.

Work package 2 - Human observation:

1 Description of techniques used to measure readability by a human observer, in general and specifically in terms of a VRM as prescribed in the Regulations. In this situation readability is expected to be defined in terms of speed and accuracy of the VRM noted by the observer as well as the memorability of the VRM. Dependence on viewing distance and angle, and relation to the observer's visual acuity is also of interest.

2 Identification of any aspect of a VRM that can be altered which can be expected to alter the readability and intelligibility of the marking (e.g. non-standard arrangement of letters and numbers).

3 Effect of spacing between individual characters and between groups of characters, or any related factors (identified in sub task 2) on the readability as defined above.

4 Any statistics on the performance of human observations against individual characters and the identification of any known problem characters, or groups of characters, that humans misinterpret.

Reporting of any results to the above tasks should, where possible, be referenced to The Road Vehicles (Display of Registration Marks) Regulations 2001 and to BS AU 145d : 1998 – Specification for Retroreflecting Number Plates.

A formal report is required to be delivered to CAST on agreed timescales stating results of a literature review addressing the issues above.

Key Criteria

In their formal proposals, potential suppliers must indicate:

- How they will undertake the task
- Any relevant skills including successful delivery of similar projects
- A proven track record of working skills in the field of readability, number plate design or ANPR.
- A plan of how the literature review will be delivered within the timeframe specified below
- A full cost plan detailing day rates for all staff members involved in the review
- Value for money

All proposals will be evaluated against the above criteria..

Timetable

Milestone	Closing date
Closing date for proposal submission	3/9/12
Assessment of proposals	4/9/12
Award of contract	20/9/12
Delivery of final literature review	17/10/2012

Formal proposals must be submitted to HOSProcurement@HomeOffice.gsi.gov.uk by 03/09/2012 quoting HOS/12/12 in the subject box.