TOYOTA

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BY ELECTRONIC SUBMITTAL

Ms. Mary Nichols, Chair
Mr. James Goldstene, Executive Officer
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Comments on the Cool Car Standards and Test Procedures, Agenda Item 09-6-4

Dear Ms. Nichols, Mr. Goldstene and Board Members;

Toyota would like to thank you and your staff for working closely with stakeholders on the Cool Cars rulemaking. Toyota has worked with your staff directly, and through our trade association during this process. We appreciate their time, and will continue to work with staff to address further issues as they arise.

We understand and support the intention of this regulation, but have significant concerns about the unintended impact of the level of stringency in the proposed requirements, particularly for the windshield, plastic glazing and rooflites (moon roofs).

1. **Use of Solar Absorbing Windshield Glass**
   Currently, the cool cars draft rule would require solar reflective glass on the vehicle windshield. This type of glass has a metal layer that causes radio wave interference issues that greatly impact many aspects of vehicle design and customer convenience in the use of radio wave devices and systems. Based on our own experience with solar reflective glass and its challenges, and the relative effectiveness of solar absorbing glass, we would like to request commercially available solar absorbing glass (60% Tts) be allowed on windshields. In order to leave adequate lead-time for suppliers and manufacturers, this should be phased in, starting from the 2012MY - 30/60/100%. A higher performance level should be considered starting from 2015MY based upon the status of the technology and its applicability to mass production. We believe that a technical review in two years time would be an appropriate time to reconsider this.

   Our experience with solar reflective windshields
   Toyota has direct experience with solar reflective glass. In Japan, we adopted solar reflective glass on the windshields of some vehicles in the 1989-1994 time frame. We moved away from this type of design due in large part to the many obstacles it caused for radio wave interference. For example, in Japan the solar reflective windshields impacted communication with the Vehicle Information & Communication System service which started in 1996 in Japan. The VICS is an example of an Intelligent Transportation System (ITS) which communicates with the infrastructure and is a "smart car" system. Also, there were concerns in Japan regarding how speed detection systems using infrared (IR) cameras might not operate because the IR was blocked by the solar reflective glass.

   Additionally, even at that earlier stage of radio wave communication, it appeared that society would be moving toward more, not less, reliance on such communications to change the utility, safety and

environmental impacts of the automobile. Global Positioning Systems (GPS), electronic toll collection (ETC), tire pressure monitoring system (TPMS), keyless entry, auto-to-home communications, automatic accident and emergency notification – these are but a few examples of communications that have moved from the experimental to the commonplace. Of course, there are also cellular and smart phones and other mobile communications devices, and the growing use of mobile broadband.

In many ways, the automobile is becoming a mobile communications device itself. Most of these communications rely on radio waves through the cabin, and specifically, through the windshield. Even with the broad use of these devices now, Toyota believes we will only see more reliance on them.

Our interest in "smart cars"
The future trend in the U.S. is for more communication between vehicles and infrastructure, as well as from vehicle to vehicle. We are interested in the possibilities of this emerging field. The potential for advanced information and communication technology is great. We hope that a rule designed to reduce greenhouse gases does not create unintended obstacles in the path of these important developments.

2. **Exemption for Plastics**
The proposed rule makes no allowance for plastic window technologies. This is an area where research is active due to the potential weight savings and fuel economy benefits. However, commercially available plastics will not comply with the rule. Therefore, CARB should exempt plastic windows from this rule. At a minimum, ARB should allow a manufacturer to request EO approval of a higher Tts for plastic or other weight reducing technology windows if the manufacturers can demonstrate equivalent or greater CO_2 reductions due to weight reductions of the vehicle.

3. **Rooflite Tts Threshold**
The proposed threshold of 30% Tts would require glazing that is extremely dark if tempered glass were used and would cause customer complaints. Alternatively, if IR reflective laminated glazing were used, it would substantially increase the weight and cost of the rooflite and would not be compatible for many current designs. To avoid these concerns, we would recommend that the rooflite threshold be raised to 40% Tts.

If you have any questions, please contact Michael Lord of my staff at 310-787-5644 or michael.lord@tema.toyota.com.

Sincerely,

Kevin D. Webber
General Manager
Vehicle Regulation and Certification Engineering