Tue, 7 March 2023
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #793

Editorial

Draper: "Industry Needs Harmonised Regulations Open To Innovation"

I have been involved in automotive lighting harmonisation activities since 1989 when I was elected chairman of GTB Harmonisation working group, then I became a freelance consultant working as President of GTB until 2021 and subsequently as a senior advisor to DVN until 2023. My "retirement" allowed me to facilitate harmonisation through daily involvement with the global lighting community. I was privileged to lead 20 DVN Regulatory Sessions before passing the baton to Dr Bart Terburg, who in addition to his role as GTB Vice President is now leading the Regulatory Sessions at the DVN workshops since 2022.

At the recent 2022 DVN US Workshop, I supported Bart Terburg to organise the regulatory session which led a fruitful discussion on how to break the barriers to innovation. A summary of the outcomes of the panel discussion is included in the in-depth article in this newsletter.

I remain frustrated with the ongoing impasse where we are tantalisingly close to achieving the goal, but we cannot have meaningful harmonisation until NHTSA finds a way to actively join the harmonisation process. It is worrying that NHTSA is very active at the UN World Forum (WP29) with the exception of lighting and signalling, the domain of the WP29 Lighting and signalling Working Party, GRE.

Industry needs harmonised regulations open to innovation but, when I have taken an initiative to lead a focussed group to work on harmonisation, industry responds by claiming lack of expert resources and points out that if the regulators do not show an interest, resources will be wasted.

At the SIAT (India) 2021 Conference, I expressed my opinion that "The innovations in automotive lighting offer clear benefits for road safety but currently cannot be fully exploited across the major global markets because of regulatory barriers. These are mostly technical barriers because the regulations and mandatory standards are out of date and / or are not harmonised and synchronised. This emotive subject can be discussed forever but, after more than 10 years of frequent debate, the global lighting

community must decide upon a constructive way forward to either start to make real progress or abandon the activity! We must act now or never, but "**Everyone**, is waiting for **Someone**, to make the first move".

My clear message is that **the global lighting community must "come off the fence" and take a clear decision**, to either act now or give up and stop the endless talking. If the global lighting community does decide to act to break the impasse, a suitable expert must be chosen to lead the activity, possibly a Harmonisation Steering Committee operating under the DVN umbrella.

Geoffrey R Draper
Former GTB President
Former DVN advisor

In Depth Lighting Technology

Geoff Draper: “Breaking Barriers to Innovation”

Executive Summary

Ten years have now passed since I launched an activity in conjunction with DVN to encourage a new debate about Innovation and the need to harmonise worldwide technical requirements for lighting and light signalling. This was the latest of many activities to address the barriers to innovation caused by a lack of harmonisation and

in 2012 I introduced the topic at the UN World Forum on Harmonisation of Vehicle Regulations (WP29), at the DVN Tokyo Workshop.

Subsequently I led many debates and exchanges of views in DVN Workshops, GTB, SAE. GRE, and at conferences in China, Germany, India, Japan, Korea and USA. The outcomes were always the same agreement that harmonisation of the technical requirements is required. However, our lighting community was reluctant to become involved because of the history of past failed attempts and lack of resources to dedicate to the hard work that would be required. I was prepared to lead the activity in parallel with my GTB duties as President, but I could not proceed when industry was not prepared to commit resources.

In January 2015 I led a panel session by teleconference, to address the subject of "Technical Requirements - Global Harmonisation and Synchronisation" and to satisfy the interest of the subject expressed by the attendees including representatives of NHTSA. This teleconference was joined by 98 lighting experts. Clear message was:

> *"it is time to focus our efforts upon the development of technical requirements, based upon an assessment of the potential disbenefits of new technologies, and to define robust objective testing requirements. The priority has to be the definition, as far as possible, of technology neutral requirements that can be adopted for both Type Approval and Self Certification systems. This conclusion is totally compatible with the existing situation in the US and the likely new approach of the UNECE where the possibilities to regularly amend and update the regulations will be strictly controlled under new legal guidelines in the upcoming revision 3 of the 1958 Agreement."*

The 2021 DVN Shanghai Workshop included a very interesting Regulatory Session that was totally dedicated to the significance of the creation of the China Automotive Standards Internationalisation Centre (CASIC) with its office in Geneva. The conclusion was a positive commitment to strive to maintain alignment of the Chinese GB standards with the technical requirements developed by the UN World Forum on Harmonisation of Vehicle Regulations (WP29).

Harmonisation, Why it is Important

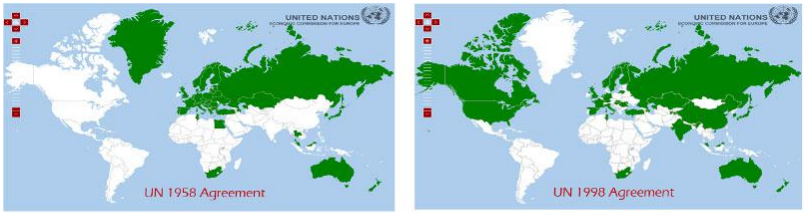
On its website, International Organisation of Motor Vehicle Manufacturers (OICA) states:

Worldwide Harmonisation of vehicle regulations is important to the Auto Industry. In a global industry, automakers are faced with a wide variety of different regulations in different countries. Harmonising these regulations world-wide, offers savings in technical resources, which can better be applied elsewhere, to produce better, cleaner, safer vehicles. It offers the possibility of reducing production complexity, resulting in lower costs and prices and a wider choice of vehicles available to all consumers.

Harmonisation doesn't always mean having identical requirements because the needs of different countries can often vary, it does mean at least eliminating unnecessary differences and bringing regulations closer together. In this way, where possible and practical, a single vehicle specification can be built to satisfy all requirements.

Harmonisation Stakeholders

UNITED NATIONS (UN) WORLD FORUM ON HARMONISATION OF VEHICLE REGULATION (WP.29)



(Reciprocal Acceptance of Type Approval)
(53 Contracting Parties)

(Global Technical Regulations)
(38 Contracting Parties)

The above maps show the geographic locations of the contracting parties that are signatory to the 1958 and 1998 agreements. The detail of the countries and nations (contracting parties) that are signatory to the two agreements can be found on the UNECE website (www.unece.org/transport/vehicle-regulations)

- WP.29 is responsible for the creation and amendment of the UN Regulations and delegates the detailed technical work to its working parties. In the case of lighting and light-signalling the working party reporting to WP29 is GRE.
- GRE is open to contributions from all contacting parties to the UN 1958 and 1998 Agreements and to NGO's with consultative status. The NGO's contributing to the work of GRE are listed below in alphabetic order:

ARAI	India Automotive Lighting Committee
CASIC	China Automotive Standards Internationalisation Centre
CEMA	European Association of Agricultural Engineering
CLEPA	European Association of Automotive Suppliers
GTB	International automotive lighting and light-signalling expert group
IARC	International Association of Auto Body and Trailer Manufacturers
IEC	International Electrotechnical Commission (IEC)
IMMA	International Motorcycle Manufacturers Association (IMMA)
JASIC	Japan Automotive Standards Internationalisation Centre
KICAS	Korea Internationalisation Centre for Automotive Standards
OICA	International Organization of Motor Vehicle Manufacturers
SAE	Society of Automotive Engineers

GRE meets twice yearly, in April and October with its informal working groups and taskforces meeting between the main sessions as required.

The DVN USA Regulatory Session – June 2022
Below is a summary of the conclusions of the "round table" session.

a. It is important to have the same requirements in Europe, China, in the USA.
b. Industry is rapidly innovating new lighting functions; GTB SAE and other organisations have to play their roles to develop the same technical requirements, otherwise it will become very complicated for vehicle manufacturers typically selling 30% in USA, 30% in China, 30% in Europe. If there are differing requirements in each of these regions it becomes very difficult to market these vehicles.
c. The GTB VLLTP Taskforce (Vehicle Level Laboratory Test Procedure) is focussed on developing a proposal for a Laboratory Test for ADB and Chinese colleagues are keen to integrate it into their standards and into C-NCAP. However, to gain acceptance of this new approach to harmonised objective technology neutral testing it will be necessary to demonstrate to the satisfaction of regulators.
d. There was a clear agreement that a change of the mindset of the lighting community is necessary to work toward harmonisation despite the direction that NHTSA, China and even the UN may take. The goal should be to achieve technical harmonisation at least with GTB, SAE, Chinese SAC/TC114/SC21, irrespective of the politics surrounding the implementation into the national regulatory systems. Perhaps it might not work out with all regions, but at least there could be a basic template for the requirements for a new lighting feature, whatever it may be. The current mindset is that harmonisation is difficult and therefore we are not going to work on it, and this guarantees that we will never harmonise. The lighting community must move forward and work together assuming that it will succeed.
e. It is clear that the current position of NHTSA, for many reasons, is a major barrier to harmonisation but the recent 327-page final rule concerning ADB contains an important section recognition by NHTSA that there is obviously the task to harmonise and they argue why they are not doing it. However, in the work of GTB, SAE, Chinese SAC/TC114/SC21, etc. it should not be forgotten that the task for harmonisation exists, and NHTSA acknowledges this.
f. Unfortunately, the way that NHTSA is required to operate is difficult; they work behind closed doors, do not talk to anyone, reach their conclusion that is eventually published, and at this point there is not much that can be done. It would be better if communication with stakeholders such as SAE, GTB, and other stakeholders, could be achieved throughout the process. NHTSA has rules about what can and cannot be communicated but there is a need to find a way to maintain a dialogue throughout the decision-making process. If the lighting community wants to achieve harmonisation it needs a dialogue to understand what NHTSA is trying to achieve. This may not solve the impasse but it might result in a better understanding of how the community could ultimately succeed.
g. On the subject of the "hello / goodbye sequences" that are allowed in the US and China, for example, the UN GRE is moving for more restriction and the community needs to understand how this situation can be managed. The current situation when the engine is not operating and almost no restrictions apply, is now being challenged by the UN GRE. It is necessary to protect the useful aspect of this for drivers trying to identify their car in a parking lot. In the USA many things are not disallowed if it can be demonstrated that they are not harmful. Lit logos are a good example where they have been allowed for a long time in the USA without any evidence of problems and the UN GRE stance is different, probably because GRE is trying to find a harmonised position among many countries.
h. The view was expressed that the lighting community is tending to confuse the development of regulation for safety and for things that are nice to have installed on the vehicle. It is important to keep talking but the community needs to separate what is relevant to safety. In the case of ADB, the UNECE countries

have allowed ADB for a long time and harmonisation seems to be easy, but it is not. Maybe it will be helpful to try to find harmonised technical requirements for safety items and accept that “nice to have” items may only be allowed in some regions.

i. It is the job of the worldwide lighting community to work hard to harmonise. It should be recognised that this can only be done if it reaches out to the USA (NHTSA). The USA is a great and proud nation that is also a key member of the United Nations that is one union and one world.
j. The worldwide lighting community is frustrated because the FMVSS108 is so out of step with the technical requirements of the UN regulations and the only way to resolve this is by more dialogue, meaning both talking and listening on both sides.
k. It should not be forgotten that the USA has much to offer the community and it is also necessary to harmonise with the USA. In this respect the SAE can provide good argument to help GTB in its harmonisation work.
l. In the past NHTSA joined SAE meetings and DVN workshops and its presence was greatly appreciated but currently, for many reasons, this is not happening. The worldwide lighting community, represented by GTB and SAE should seek to establish a high-level contact with NHTSA to discuss how the need for harmonisation of the technical requirements of lighting can be progressed by separating the technical aspects from the politics of their implementation into national legislation.

Harmonisation Activities Since 2012

In March 2012, as the president representing GTB, I was invited to meet the European Commission regarding the need to simplify UN regulations to remove the administrative burden (Joint EU and Japanese Initiative). In response, GTB submitted an initial proposal to WP29 to simplify the regulations that was formally discussed at the WP29 session in June 2012.

In April 2013 the European Commission presented a proposal to GRE for simplification of Lighting Regulations, based upon the GTB proposal. This resulted in the formation of the GRE Informal Working Group on Simplification of the Lighting Regulations (SLR) in September 2014. Since 2014 the SLR working group has held 55 meetings, typically of 2-3 days duration and with expert contribution from 15-20 experts from Europe and Asia. The preparatory work for each session has been done by the GTB working groups and the secretariat provided by GTB (Davide Puglisi – GTB Secretary General). The GRE informal working groups are always chaired by a representative of the UN Contracting parties and the SLR group was chaired initially by Michel Loccuffier, (GRE Chairman) representing Belgium and is currently chaired by Derwin Rover (GRE Vice Chairman) representing The Netherlands.

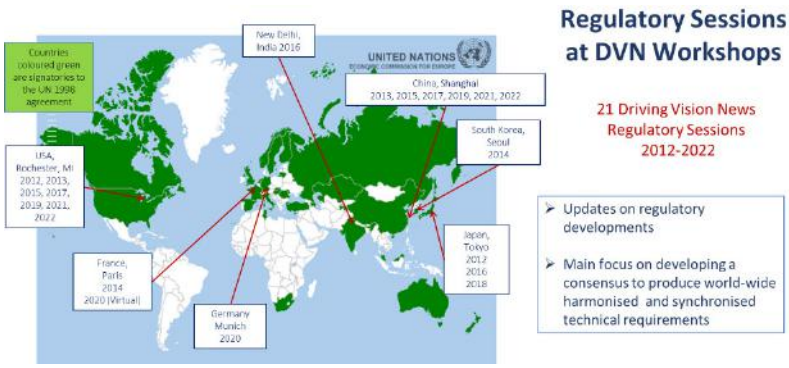
The GRE SLR group has reduced the number of UN Regulations from 41 to 14 and is now working on the simplification of the installation regulations. As part of this process, the technical requirements are being amended and simplified to make then technology independent, performance based and with objective testing requirements to be suitable for type approval and self-certification regulatory systems. This work is expected to be completed in 2025 and at that time the technical barriers to worldwide harmonisation should have been demolished.

The role of GTB is crucial to the success of the harmonisation process because of its international membership that includes China (and Taiwan), Japan, Korea, India.

DVN, although not having a voice in the WP29 World Forum, has a very active international community of lighting specialists and provides a unique communication platform to inform and educate its members that includes high level managers and director. Since 2010, I have had the privilege to contribute to the DVN Workshops and

to use the DVN platform to lead a harmonisation discussion that has grown in strength over the past 13 years.

DVN has held 21 Regulatory Sessions since 2012 and the map below shows the wide coverage of the sessions that has provided high level contribution to the harmonisation debate. Reports of the most significant sessions are available from DVN by request.



Eleven years have now passed since I launched an activity in conjunction with DVN, to encourage a new debate about innovation and the need to harmonise. In 2012, I introduced the topic at the UN World Forum on Harmonisation of Vehicle Regulations (WP29) in Geneva, at the DVN Tokyo Workshop and at the ACEA Sino-Europe Conference in Karlsruhe, Germany.

Subsequently I led many debates in DVN Workshops, in GTB, SAE. GRE, and at conferences in China, Germany, India, Japan, Korea, and USA. The outcomes were always the same agreement that harmonisation of the technical requirements is required. However, our lighting community was reluctant to become involved because of the history of past failed attempts and lack of resources to dedicate to the hard work that would be required. I was prepared to lead the activity in parallel with my GTB duties as President, but I could not proceed when industry was not prepared to commit resources.

Trade Deal Negotiations

In most international trade agreements, there is a discussion about how differences in standards and regulations shall be treated. The recent Transatlantic Trade and Investment Partnership (TTIP) initiative was intended to create a trade agreement between the USA and The European Union and there were arguments for a pragmatic solution. In the case of automotive standards, it was acknowledged that, overall, both US and EU requirements ensured similar performance and safety and could be mutually transposed “en-bloc” into the respective national legislation.

Unfortunately, in the case of TTIP the politics between the EU and USA changed and the initiative was abandoned. This brief overview of the TTIP negotiations is greatly simplified but it does demonstrate the futile debates about “my regulations are better than yours” that is a major block to harmonisation.

Technology has Changed the Harmonisation Mindset

For many years, the harmonisation debate concerned vehicle geometry, device installation, and the age-old argument about photometric requirements for glare and visibility of the passing (low) beam. Progress was made and now there is a good level of harmonisation.

Now the lighting community is rapidly innovating with the advent of LEDs and automated systems that offer significant improvements for traffic safety. Examples are Adaptive Driving Beam and On-Road Projections. Harmonisation of the US and UN technical requirements for ADB has been debated since 2010 and is still some years away but many recent innovations do not have an existing regulatory based, and

technical requirement must be developed for adoption in the various regulatory systems. In this case there is a strong logic to suggest that the job is only done once, and harmonised technical requirements shall be developed and adopted globally.

This changed emphasis is mainly due to the lighting innovation activity driven by the vehicle manufacturers wishing to offer appealing vehicle designs, improved safety for all road users, and greater driver comfort and assistance. In many cases these innovations cannot be exploited until the regulations are updated and unless the requirements are globally harmonised, not all market opportunities will be open.

In my view, as the evidence shows that industry wants to have harmonised requirements, it is the job of industry to dedicate resources to make it make it possible. Regulators will not volunteer to harmonise without a well-defined proposal that will be suitable for both type approval and self-certification systems.

We must stop blaming the regulators, we must put our own house in order first and agree on a new approach to harmonisation to present to GRE with one voice representing our lighting community.

The Difficulties for the Administrators - Politics and Harmonisation Do Not Mix.
I have spent more than 30 years representing GTB at the UN Geneva at WP29 and GRE, and therefore had the opportunity to talk to many of the representatives of the national governments that are signatory to the UN 1958 and 1998 agreements. My conclusion, in the specific case of harmonisation of the lighting technical requirements, is that the politics associated with the terms of the UN 1958 and 1998 agreements are not helpful and, indeed, create unnecessary barriers to innovation and improved traffic safety.

In 1951 GTB was established as a working party to develop harmonised technical requirements, reporting to the UNECE Ad-Hoc Working Group on the prevention of road accidents. GTB held its first meeting in Brussels in 1952 and subsequently, WP29 held its first session in 1953 with GTB contributing as the lighting expert group.
In 1958 the UN 1958 agreement was adopted.
Initially, the contracting parties were European countries but as GTB was a standardisation working party consisting of experts from ISO, CIE and IEC, other countries such as the USA actively contributed.

As the years progressed into the early 2000's the USA (NHTSA) finally stopped its participation for political reasons, and this was the start of the difficulties of lack of harmonisation between the USA FMVSS108 and the UN Regulations. It was clear that the US regulatory system was based upon self-certification back up by enforcement through market compliance testing but the problem of lack of harmonisation was due to a failure of the US to keep FMVSS108 updated in line with the adaptation of the UN regulations to technical progress. This problem is exacerbated because NHTSA consider that the UN regulations are unsuitable because they contain subjective assessments that are not suitable for the self-certification regulatory approach. This is the main reason why the adoption of ADB has been such a problem for NHTSA who have tried (unsuccessfully) to develop a real-life photometric assessment on exterior test tracks.

It is clear that NHTSA finds itself in a very difficult situation as explained by David Hines and Markus Price during the DVN teleconference of January 2015. *"David Hines made it clear that NHTSA is obliged to focus on the possible disbenefits to safety. This means that NHTSA has a responsibility to spend its resources, funded by the taxpayer, wisely and it needs to be sure that time is devoted to introduce provisions into FMVSS108 for technologies that will be widely installed into vehicles and provide real safety benefits. Markus Price pointed out that some considerations NHTSA has to take into account were conspicuously absent in proposals to align with UN regulations. For*

example, he questioned "how do we measure the performance of these new systems?" and expressed disappointment that manufacturers promoting the new technologies are not identifying objective methods of assessing performance or, if they apply such objective methods, are not prepared to share their experience. If these issues are addressed by manufacturers, and shared with NHTSA at an early stage, NHTSA will have the opportunity to update the regulations more quickly."

Obviously, these NHTSA comments were made more than 7 years ago and the political situation in the USA has become even more difficult for NHTSA, and it has become more difficult to maintain a meaningful dialogue. Unfortunately, the latest rule-making on ADB has further strained relationships but in my view, it is in the interest of the lighting community to reach out to set up a new dialogue with NHTSA to search for a way forward instead of complaining about NHTSA's lack of engagement.

The UN 1998 agreement was established, following an initiative by USA, EU and Japan, with the objective of developing harmonised technical requirements that would be adopted and transposed into the national legislation of the contracting parties. The 1998 agreement does not contain any administrative provisions related to type approval and the focus is upon harmonising the existing technical requirements of the contracting parties or upon developing new harmonised common requirements to follow technical progress. The process is administered by WP29 with the detailed work caried out by sub-groups of the various working parties reporting to WP29.

Some progress has been achieved to develop GTR's for some vehicle equipment, but not for lighting and signalling and even though the USA is a contracting party to the UN 1998 agreement there are difficulties for NHTSA to finally transpose them into the Federal Safety Standards in a timely manner.

In the case of lighting, GRE has debated the need for developing GTR's but in reality, the contracting parties have no appetite to dedicate their limited resources to what they consider to be "mature technologies"! Regulators have limited resources and the priorities are focussed around the subject of Automated and Autonomous Vehicles. This situation then causes the lighting community to become sceptical over devoting their limited resources to develop GTR's for lighting that are unlikely to be adopted.

Use of the UN Technical Requirements for Lighting developed at GRE by Countries that are not Contracting Parties to the 1958 Agreement.

Traditionally, the difficulties to harmonise have been associated with the countries who are not signatories to the UN 1958 and operate their own national certification systems. Examples were USA, Japan, China, Korea, India, Canada, Australia but a major step forward was led by Japan who developed a very detailed programme to, step-by-step, sign the 1958 agreement and adopt the UN Regulations into its national legislation. We now have a situation where China, Korea, India, Canada, Australia, and other countries are now contributing to the work of GRE and regularly updating their national standards and legislation in line with the evolution of the work in GRE. This situation is not perfect because industry is confronted with delays in the acceptance of their latest vehicles due to the time required to synchronise the latest GRE requirements with their national legislation. Sadly, the USA is not following this trend with the result that important innovations for safety improvement are being blocked, such as ADB.

The Influence of Special Type Approvals

Where a vehicle manufacturer develops a new model with innovative features that cannot be approved to the provisions of a current regulation, it is possible to obtain a special approval to place it on the market of a supportive country using a special approval procedure.

The vehicle manufacturer can obtain an approval to the EU Regulation 2018/858 under the provisions of Article 39. This is not a type-approval to the UNECE Regulations; it is a procedure for allowing the Type-Approval authority of a member state of the European Union (EU) to issue a provisional approval for a new technology that cannot be approved to the existing UN Regulations. This provisional approval is only valid in the territory of the EU Member State of that approval authority, in respect of a type of vehicle covered by the exemption sought. Other EU member states shall be informed of this approval, but they are not obliged to acknowledge it in their territories.

For manufacturers not operating in the EU, a similar procedure is defined in the UN 1958 agreement. A Contracting Party applying a UN Regulation may grant an exemption approval pursuant to a UN Regulation for a single type of wheeled vehicle, equipment or part which is based on a new technology, when this new technology is not covered by the existing UN Regulation and is incompatible with one or more requirements of this UN Regulation. In such a case, the procedures set out in Schedule 7 annexed to the Revision 3 of the 1958 Agreement shall apply.

These special approvals can provide an opportunity for a manufacturer to launch a vehicle with innovative features onto the market in the country granting the special approval but the approving country is required to inform the UN and make proposals to amend the relevant UN Regulation in accordance with the procedure applicable under the Revised 1958 Agreement.

This procedure can offer a manufacturer an opportunity to gain experience of the operation of the vehicle in a real traffic environment, but it is not a means to overcome a harmonisation issue because it will only work in countries that are signatory to the 1958 agreement and already adopting the regulation to be amended.

The role of Automobile Standard Internationalisation Centres

There are currently three Automobile Standards Internationalisation Centres playing an important role at the UN World Forum (WP29). Japan took the first initiative to launch JASIC and more recently Korea and China have followed by creating KICAS and CASIC, respectively, with their own versions having similar objectives.

I have had the honour of working closely with JASIC on harmonisation projects for lighting and light signalling since 1990, initially as the chairman of the GTB Harmonisation working group and I continue to enjoy good relations. I am also proud to have good relations with Korea and China.

I am convinced that JASIC, KICAS and CASIC provide a good basis for a new harmonisation initiative that I describe in the later chapters of this article.

- Japan JASIC was founded in 1987 and has actively supported cooperation between the Japanese government and industry for the internationalisation of automobile regulations and certification systems by the government. As an ongoing member of WP.29, JASIC is involved in the establishment and amendment of UN Regulations, the promotion of mutual recognition of approvals based on the UN Regulations, and the further internationalisation of Japanese vehicle regulations and type approval systems.
Japan became a signatory to the UNECE 1958 Agreement (Reciprocal Recognition of Type Approvals) in November 1998 and a signatory of the UNECE 1998 Agreement (Global Technical Regulations) in August 2000. At the United Nations, to support the activities of the Japanese government, JASIC regularly sends experts to meetings of WP.29 and its six "GR" working parties.

- Korean KICAS was launched in 2018, in accord with the Korean Automobile as a specialised organisation for harmonisation, international cooperation, and development of relevant systems and polices for automobiles on 6 December 2017.
KICAS operates as part of KATRI (Korea Automobile Testing & Research Institute) with the main duties being:

o To support MoLIT to improve and/or develop relevant systems and policies

o The expansion of activities in UNECE WP.29 including harmonisation and R&D related to vehicle regulation

o Support and cooperate with vehicle manufacturers

o Strengthen international cooperation with other countries

- Chinese CASIC was founded in 2021 to further strengthen international exchange, coordination, and cooperation; on the development of automobile standards and regulations, and to assist the development of the Chinese automobile industry.
Management of CASIC is the responsibility of the China Automobile Technology Research Centre (CATARC), based in Tianjin, with the important guidance and support of the relevant national governmental ministries and commissions. In June 2022, CASIC opened its office in Geneva, Switzerland.

Recommendation for a Way Forward

I believe that it is necessary to encourage the lighting community to come together with a single voice to actively promote a novel approach for worldwide harmonisation of the lighting and signalling technical requirements at WP29 / GRE. To do this, I propose that a new independent steering committee is created to operate on the DVN platform to provide a voice for all stakeholders.

This steering committee would develop and agree a proposal to be formally presented to WP29 with the following objectives:

The steering Committee should include representatives of ARAI, CASIC, CLEPA, GTB, IMMA, JASIC, KICAS, NHTSA, OICA, SAE.
The international automotive lighting expert group (GTB) would be needed to formally present the proposal to the UN World Forum (WP29). GTB is a non-governmental organisation with special consultative status at ECOSOC (UN Economic and Social Council), having a unique global group of vehicle lighting experts supporting the international regulatory process through the combination of their experience and skills as vehicle manufacturers, lighting systems manufacturers, light source manufacturers, test laboratories, regulators and academia. Importantly, GTB is a technical group without a prime lobbying role and is not in competition with the standardisation bodies .

Following my presentation to SIAT2021 I was asked one question:
What is the basis for your optimism that this latest initiative will succeed
My answer: “If I compare today with 10 years ago I see many encouraging signs of a change of attitude, particularly in China, Korea and the USA.
- The SAC/TC114/SC21 is working hard to address the administrative delays to the regular updating of their GB standards. There is evidence of a change of attitude by the government.
- China has recently launched its CASIC (China Automotive Standards Internationalisation Centre) based in Geneva to improve its involvement in the work of WP29. This follows Japan and Korea who have similar organisations.
- Korea is successfully incorporating the UN technical requirements into its KMVSS (Korea Motor Vehicle Safety Standards and is operating a self-certification system with enforcement similar to the USA.
- The USA has a new administration with an interest in internationalisation so it is hoped that there may be a change to update the FMVSS108. Another major change is that the “BIG 3” US Vehicle manufacturers (Ford, GM and Stellantis) have evolved into strong supporters of harmonisation as opposed to their previous policy of protectionism for US businesses.
- The other significant reason for optimism is that all governments do not oppose harmonisation for the sake of safety improvement but they do not have the resources

to devote to the work to make major changes to their legislation as required under the UN agreements. I believe that they should find a pragmatic approach to be appealing if it is well justified by a united industry approach."

In conclusion, I have tried to explain my understanding of the issues associated with the global harmonisation of automotive lighting. Stimulated by the discussions during the DVN 2022 US Workshop Regulatory Session, I have outlined a proposal that may help the automotive lighting community to break down the barriers to innovation but, to succeed, this proposal needs your support with a commitment to provide the necessary expert resources.
My proposal is an effort to develop a proposal for a political solution at the UN World Forum (WP29) that is unique to automotive lighting and it is in-line with the decision of GRE to adapt the technical requirements to be suitable for implementation into type-approval, mandatory standards, and self-certification regulatory systems. If the political solution that I am proposing can be found at WP29, the barriers to innovation for safety can be removed and then the process through GTB, GRE, WP29 can continue normally, as today, without any duplication of expert resources.

However, as I am describing a "political solution", I am convinced that the Steering Committee working on the DVN platform will be required to find a consensus for a proposal to be formally submitted by GTB to WP29 with a timescale of the end of 2023.
The next step is left to the global lighting community to decide whether, or not, to take a new harmonisation initiative to create a steering committee. This committee will need a suitable "enthusiastic" expert to lead this "political solution".

Lighting News

Prof. Dr.-Ing. Schmidt-Clausen: 1935 - 2023

LIGHTING NEWS

The world has lost a shining star of driver vision and vehicle lighting research and education. Prof. Dr.-Ing. Hans Joachim Schmidt-Clausen died in Lippstadt on 23 February, aged 87.

He studied at TU Darmstadt, earning his doctorate in 1968 from the Institute of Electrotechnics' Lighting Lab there; his thesis was about the perception of light pulses. After a time at Philips Eindhoven, he changed to his main industrial job at Hella in Lippstadt until he was appointed Professor at TUD in 1981. His research focus was on the basic spectral sensitivity V(λ) of the human eye, enhanced by aspects of vehicle lighting and road lighting infrastructure improvements. Under his watch, experimental research was carried out for the likes of BASt, the German Federal Highway and Street Research Institute.
Professor Schmidt-Clausen was active over many decades in national and international organisations for vehicle lighting regulatory development, including GTB and GRE; and was able to positively influence many legal regulations.

In a visionary approach, Prof. Schmidt-Clausen founded in 1995 the international vehicle lighting symposium PAL (Progress in Automobile Lighting) which evolved to become the International Symposium on Automotive Lighting (ISAL)—the world's biggest conference on the subject.

Professor Schmidt-Clausen retired at the end of 2002. After retirement, he lectured as an honorary Professor at Fudan University in Shanghai, and was awarded in 2005 with the Golden Diesel Ring for his great contribution to the increase of traffic safety. He also has earned great merit in the Asia Link Program between TU Darmstadt; University of Helsinki, and Fudan University.

All of us in the vehicle lighting community—including Wolfgang Huhn and Michael Hamm representing DVN—sadly bid him farewell with the greatest of respect.

Here is a list of Professor Schmidt-Clausen's known PhD students and their topics:

1991 Jörg Ed. Hartge · Spectral Sensitivity with small Lightsources
1994 Horst Finsterer · Pattern Conspicuity and perception in mesopic status
1994 Helmut Frank · Traffic Sign Requirements at Night
1995 Martin Enders · Comparison of Methods to determine Eye spectral sensitivity
1995 Joachim Damasky · Lighting Requirements on Headlights
1996 Herbert Wambsganss · Visibility and Requirements on Road Markings
1997 Michael Hamm · Spectral Sensitivity and Visual Response Time
1997 Hans. Meseberg · Lighting Reqirements on Vertical Traffic Control Systems
1998 Christian Boehlau · Expert System for Layout of Vehicle Lights
1998 Johannes Aulbach · Reqirements on Visual Information of Guidance Signs
1999 Wolfgang Huhn · Requirements on Adaptive Light Distribution
1999 Ernst-Olaf Rosenhahn · Lighting Requirements in Adverse Weather
2001 Joachim Ripperger · Lighting Requirements on Rear and Stop Lamps
2001 Thomas Dahlem · Methods to Evaluate Vehicle Headlights
2001 Stefan Milch · Video based Detecting on-board a vehicle
2001 Peter Lehnert · Vehicle Dynamics effects on Light Distribution
2001 Daniel Armbruster · Adaptive Vehicle Signal Lights
2003 Martin Grimm · Ambient Interior Lighting
2004 Carsten Diem · Viewing Behaviour in Dynamic Traffic
2005 Yandan Lin · Visual Performance Model under Mesopic Light Levels

Geely Galaxy Range Launched

LIGHTING NEWS

Geely have launched a 7-model Galaxy range of automobiles, and the first of them to start production is the L7 compact SUV. The range will include hybrid L5; L6; L7, and L9 models, as well as pure-electric E6; E7, and E8 cars.

All models share familial design elements, including the front lighting system and a strong central Galaxy logo.

The L7 rear lights are sculpted as a progression of arrow-shaped elements framing a luminous geely callout in the middle of the bar traversing the hatchgate.

Hella's New Construction and Mining Lights at Conexpo

LIGHTING NEWS

Hella will present innovative new products in Las Vegas next week at Conexpo, the construction trade show. Hella's launches will include the new C240 LED combination headlamp which integrates low and high beam; position and daytime running light, and turn signal/hazard flasher functions.

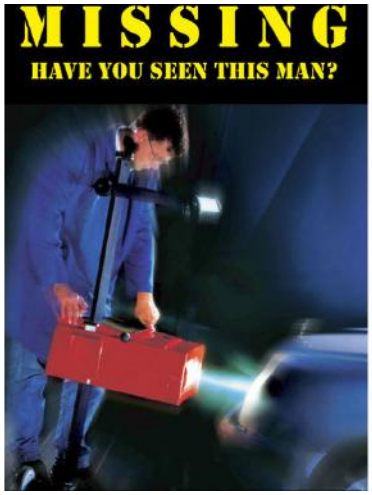
The round and square S series work lamps (shown here) offer innovative LED technology and complement the Module 70; Module 90, and Power Beam work lamp families. They provide even illumination and popular high colour temperature of around 6500K. The Module 70 and Power Beam models are available in 1,000- and 1,850-lumen versions, and Module 90 is available in 1,850- and amazing 4,000-lumen versions.

The Roklume 280N Smart is another new light for heavy-duty applications, to increase safety at mining and construction sites. This lamp changes the colour temperature from warm to cool white and the light colour to green or amber, depending on the variant. This adjustment of light colour assures highest possible visibility in dusty; snowy, or foggy conditions. The lamp has six illumination options, including 'Zeroglare' with a patent-pending new kind of reflector.

And the Roklume 280N Generation 2 work lamps are well-suited for harsh mining environments and heavy-duty applications. With output of up to 5,000 lumens and six illumination options, including a tunnel floodlight, these work lamps provide superior visibility with just 50W power consumption.

American Aim Revisited
By Daniel Stern, DVN Chief Editor

LIGHTING NEWS



A bit over six years ago here in DVN, I **reported and commented** on the almost complete lack of attention paid to headlamp aim in North America. It was an old-old problem then; take a look at **this 1967 magazine article**, starting with the last paragraph on the linked page and continuing on the next page of the article.

Since that 2017 DVN article, things have moved simultaneously opposite directions on the North American island where vehicle regulations are done…differently.

First, the good news: the aim of headlamps on new cars in America is getting better. IIHS had only just begun their headlamp tests when we squawked about headlamp aim in 2017, and now with a good collection of years' worth of experience and data, it's quite clear the IIHS headlight performance tests, which—this is key—are done on vehicles as received, without changing the headlamp aim, are spurring automakers to do a better job with new-car lamp aim at the end of the production line. That's terrific, because as headlamps grow smaller and more luminant; powerful, and adaptive, the urgency of correct aim grows.

But it is still all but impossible for anyone in North America to get anything like a proper aim job once their vehicle isn't new anymore. I recently replaced my car with one several years newer, and it was immediately apparent that at least one of its headlamps was improperly aimed; the left lamp shone higher than the right one. Where I live, as in most of the U.S. and Canada, no vehicle inspection is ever required, so I could have gone right on driving it as-was; that's what most people do. Of course, I couldn't accept that. I live in a medium-sized city with plenty of auto garages, but only at great difficulty did I find a shop—*one* shop—with an aiming machine and the will to use it in my greater metropolitan area. In clear traffic it was most of an hour's drive away, past countless other shops unable or unwilling to do the job.

They let me watch, which I did without introducing myself as DVN's editor. The first thing I noticed: they were using an old green Bosch aiming scope, a veteran of at least 40 years, with a rest-of-world type adjustment wheel calibrated in declination percentage, and no factory- or field-applied markings for the overwhelmingly common US-spec VOL (0.7%); VOR (0.0%), and VO (0.0%) lamps. Nothing wrong so far, but there were no fingerprints evident on the dusty wheel, either; looked like it was never moved from the 0.0% setting. My car's headlamps are the VOR type, so 0.0% was the

correct setting, but that seemed more a matter of good fortune than deliberate setup; the technician never checked the lenses to see whether they were VOR, VOL, or another type—had my headlamps been VOLs, they would have been aimed wrong with the scope at 0.0%.

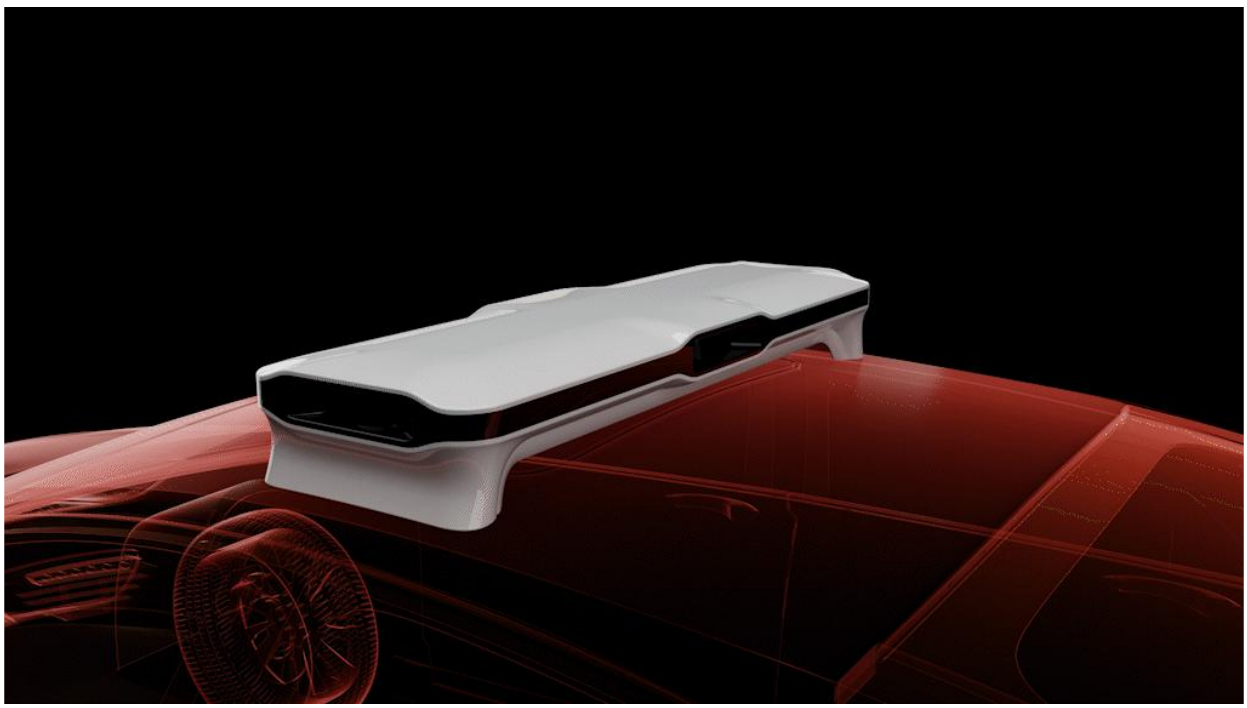
The trouble is less that one misused scope in one shop offering headlamp aim adjustment to those who know to ask for it creates an epidemic of misaimed headlamps, it's more the existing epidemic of misaimed headlamps is not being addressed. And it's only growing worse, particularly as real ADB comes increasingly to Canada; this worsening will spread south of the border as well, if NHTSA's idea of ADB proves somehow feasible.

Clearly, no level of government is picking this low-hanging fruit in the push to eliminate (or at least reduce) traffic crashes and especially pedestrian deaths. Just as clearly, non-governmental entities have the potential to make great change for the better, as IIHS tests have done for new vehicles. Now the bigger problem of misaimed lights on vehicles in service has got to be tackled. Somebody's must boldly be first to stop shrugging and set to work applying the necessary leverage to the right levers and fulcrums to make the necessary change. Makers of headlamp aiming scopes can publish service guides listing garages they've sold scopes to. Lighting tier-1s can sponsor safety weeks as has been done for decades in Germany. Automakers can issue service bulletins on headlamp aim, and make sure their dealerships have the correct tools and use them correctly. Anything! Even small steps would be better than the present nothing.

Driver Assistance News

Solid-State Lidar for L4 from RoboSense

DRIVER ASSISTANCE NEWS



RoboSense have released their RS-Fusion-P6 (P6), the first automotive-grade solid-state lidar fusion solution for L^4 perception systems. As the fifth P-series product, the P6 will mainly support point-to-point full-scene environmental awareness for advanced autonomous driving in complex scenarios such as highways and urban areas.

The P6 has four of RoboSense's RS-LiDAR-M series automotive-grade solid-state lidars, which enable perception in a 360° horizontal range out to 200 metres' distance. It also has RoboSense's two-dimensional MEMS scanning chip to provide a 'gaze' function, which can dynamically switch the scanning mode and form for scenarios such as high-speed roads and urban areas, for better overall scene-based perceptual improvement.

The P6 runs RoboSense's Perception software, which provides real-time point cloud perception results for scenario-based autonomous driving in passenger cars, so it can clearly identify road markings such as lane lines and curbs, and output data to the autonomous driving system including road ID; location; curvature; area, and confidence. At the same time, the P6 can also perceive dynamic and static obstacles such as pedestrians; cyclists; large and small vehicles; trailers; cone barrels, stone piers, and other suchlike in real time, and output 13 types of perception information including ID; type; position; size; speed; acceleration, and direction of movement for each obstacle—further supporting point-to-point full-scene environment perception for advanced autonomous driving.

BMW Preview: Screenless HMI

DRIVER ASSISTANCE NEWS

BMW designers want to move away from ever-larger touchscreens, as showcased on their i Vision Dee concept car. Instead of screens, a 'Mixed Reality Slider' projects increasing levels of immersive images on the windshield, from simple head-up style readouts to a windshield entirely filled with VR imagery—whether for a driving game or a training simulation. During a demonstration at a BMW test centre, journalists wore a VR headset and drove a BMW M3 at high speed while immersed in the virtual urban streets of 'BMW Town', avoiding artificial obstacles and picking up award coins in the virtual path. Olivier Pitrat, a BMW engineer in charge of UI and UX design, said drivers will decide how they wish to interact with the car, though operator safety, he said, will remain paramount.

This idea allows BMW to focus on luxury materials and craftsmanship while designing their dashboards, rather than covering every last centimetre of space with screens which are falling out of favour with designers, and are **demonstrably** inferior—perhaps even abjectly unsafe—as a means of controlling a vehicle's functions and features. BMW head of design Kai Langer says "We think we have a better way. You can’t watch Netflix in your front seat anyway, and no one wants to look at a giant, switched-off TV in their living room".

Mercedes-Luminar Lidar Tech Joinup

DRIVER ASSISTANCE NEWS

Mercedes-Benz announced a collection of innovations during their Operating System Strategy Update in Sunnyvale, California last week. As **previously reported** in DVN, Mercedes-Benz have significantly increased their investment in an existing partnership with Luminar, whose Iris lidar technology will be built into the next generation of Mercedes models by the middle of this decade.

The two companies have been in close collaboration for over a year following their initial partnership, but Luminar's Iris lidar entered series production just recently, this past October. Luminar say their lidar program has successfully completed its initial phase and associated milestones. Mercedes intend to use the Iris lidars to help safely navigate the automated driving systems MB.OS will deliver—including higher speeds on freeways, and enhanced driver assistance in urban areas.

Mercedes-Benz Group development & procurement CTO and management board member Markus Schäfer says, "In a first step we have introduced a Level-3 system in our top line models. Next, we want to implement advanced automated driving features in a broader scale within our portfolio. I am convinced that Luminar is a great partner to help realise our vision and roadmap for automated and accident-free driving".

Lumotive's New LCM for 'Lidar 2.0'

DRIVER ASSISTANCE NEWS

Presently, lidar is transitioning from electro-mechanical to solid-state systems. What next? 'Lidar 2.0': software-defined, solid-state, scalable 3D sensing with lower costs; faster innovation, and improved user experience.

Though lidar has been evolving with improvements in cost; size, and reliability, movement in those directions has been constrained by unacceptable trade-offs in range; resolution, and field of view (FoV). Now comes Lumotive's new optical semiconductor, called a Light Control Metasurface (LCM), and Lumotive say it stands to change the game.

At its core is a patented metamaterial capable of blocking; absorbing; enhancing, or bending electromagnetic waves to achieve unusually good sensing performance exceeding that of conventional materials. The Lumotive chip's scalable, solid-state 3D sensing architecture uses patented beam-steering technology without moving parts to deliver best-in-class performance; cost; reliability, and size, according to Lumotive CEO Dr. Sam Heidari. The zero-inertia LCMs enable steering of light in any pattern across the entire field of view within microseconds.

The Lumotive chip is the key component of the company's Open Lidar API, aimed at leading the industry towards scalable; ubiquitous, affordable 3D sensing based on Lidar 2.0 technology. According to Heidari, more than two dozen companies currently are evaluating the LCM.

General News

Musk Rains Tesla Promises at Investor Day

GENERAL NEWS

At Tesla's Investor Day, Musk and Chief Financial Officer Zachary Kirkhorn gave an expansive presentation of the possibilities of running the world on wind- and solar-generated electricity, and the need to invest about USD $10tn over 10 years' time in stationary battery farms that will store renewable energy.

"Earth will move to a sustainable-energy economy, and it will happen in your lifetime", Musk prognosticated, without specify the age of the person he had in mind.

Key takeaways from Tesla Investor Day:

- Tesla's next-generation vehicle platform will reduce the size of the necessary plants by almost half, while being more efficient and turning out the same volume of vehicles as its current factories. Costs per plant will be halved. The idea is to 'reinvent' how vehicles get produced mostly by robots, with design; engineering; software developers; finance, and construction all in the same workplace.
- Tesla's next 'gigafactory' will be built in Monterrey, Mexico. At the end of 2022, the company had installed capacity to build 1.9 million vehicles a year. Musk's goal is to reach capacity of 20 million vehicles, for which he says the company will need 12 'gigafactories'.
- The Cybertruck will enter production before the end of 2023 and go into full production in 2024 (and perhaps 'Full Self-Driving' is still/again scheduled move out of the realm of make-believe "next year", as it has been for multiple years now).
- There was no claimed date of when Tesla's 3rd-generation vehicles will enter production.