Simplification of Lighting and Light-Signalling
Technical Requirements
Stages 2 and 3

The Opportunity of a Lifetime
Transform the regulations to become Performance Based / Technology Neutral

- Installation
- Road Illumination Devices
- Light Signalling Devices
- Retro-Reflective Devices

Timing: Expect that GRE IWG-SLR will start working on Stage 2 in September 2017
UN WP.29
Stage 1 - Entry into force – January 2019
Stage 2 - work expected to start in September 2017
- GTB presented first ideas in December 2016

China
Programme to simplify the GB mandatory standards by the end of 2020. GTB has been chosen as China’s partner of choice and is expected to act as the bridge between the Chinese expert group (C-GTB) and GRE.

USA
Ground-breaking work by NHTSA and SAE to develop requirements for ADB. This provides a good basis for development of a GTR.
GTB is developing a dialogue with NHTSA, in conjunction with SAE (the GTB member representing the USA Experts)
GTB Technical Structure

GTB restructured in November 2016

- to focus on supporting regulatory simplification
- to achieve recognition as a “Partner of choice” of the regulatory bodies.

**COMMITTEE OF EXPERTS**

One head delegate of each member + Advisors

**TECHNICAL STEERING COMMITTEE**

WG Officers

**PRINCIPAL WORKING GROUPS**

- Installation
- Front Lighting
- Light Signalling
- Light Sources

**ADVISORY GROUPS**

- Strategy
- Regulatory Cooperation and National Coordination (RCNC)
- Safety and Visual Performance
- Photometry
GTB Regulatory Cooperation and National Coordination (WG-RCNC)

15 GTB European Members
(15) Member Coordinators

- Japan
  Member Coordinator

- USA
  Member Coordinator

- China
  Member Coordinator

- Republic of Korea
  Member Coordinator

- Taiwan
  Member Coordinator

New members expected to join GTB
- Use of regulation as barrier to trade is no longer appropriate
- Trade Partnerships (e.g. TTIP) – Regulatory Implications
- Renewed interest by US NHTSA – Focus on adaptive technologies
- NCAP systems
- Increasing pace of innovation of adaptive lighting systems - Digitalisation
- New lighting demands for autonomous vehicles
- Outcomes of panel sessions at DVN Regulatory Workshops in USA, Japan, China, France, India and South Korea
  - Recurring theme is the need to harmonise / synchronise the technical requirements of the various type approval / certification/ self certification systems
Countries coloured green are signatories to the UN 1958 agreement.

USA, Rochester  
2012, 2013, 2015, 2017

France, Paris  
2014

New Delhi, India  
2016

South Korea, Seoul  
2014

China, Shanghai  
2013, 2015, 2017

Japan, Tokyo  
2012, 2016

2012-2017 - 12 Driving Vision News Regulatory Sessions
Focus upon the development of technical requirements

- Based upon an assessment of the potential disbenefits of new technologies, and to define robust objective testing requirements.

- Definition of technology neutral requirements that can be adopted for both type-approval and self-certification systems.

This approach is totally compatible with the existing situation in the US and the “new approach” for the UN Regulations.
Focus upon the development of technical requirements

Major Considerations

- Development of Installation requirements to define performance criteria of the complete system in terms of visibility (see and be seen) and glare
  - possibly based upon the CIE TC4-45 / SAE Pedestrian Visibility approach
  - virtual testing methods

- Definition of objective testing requirements to verify compliance with performance based requirements at the vehicle /on-road level

- All requirements shall be verified through independent research
Focus upon the development of technical requirements

**Major Questions**

- How to avoid the need for interpretations and judgement of the approval authorities currently allowed in UN regulations but unacceptable in a self certification or GTR regime?
- How to redefine “apparent surface” and “single lamp” in performance based terms?
- How to define and assess geometric visibility requirements?
- How to include “specific national operating / traffic conditions”? 

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In addition to simplifying the UN Regulations there are wider benefits to be exploited:

- Synchronisation of the technical requirements of the individual national mandatory standards with the UN regulations. (e.g. China, Republic of Korea, India, Brazil)

- Overcoming the objections of the US NHTSA to the current UN Regulations that are deemed to be unsuitable as a basis for a self certification system and its enforcement.

  (note; current work by NHTSA and SAE to introduce ADB into the FMVSS108)
GTB DRAFT  Plan to synchronise UN and GB standards as part of the GRE Stage 2 activity.

Synchronisation - Technical requirements of UN and Chinese Regulations

UN Simplification Stage 2
(Technology Neutral / Performance Based)

Window of opportunity

2017 2018 2019 2020 2021

GTB introduces 1st proposal to IWG-SLR

02-2017 1st drafts

03-2017 GTB contributes to a workshop led by CATARC

06-2020 Approval

12-2020 Release

12-2019 draft for approval

DEADLINE GRE 04/2020
Formal Submission to 11/2020 WP29

Mid-2021 Entry into force

03-2019 draft for approval

GTB 1st proposal to IWG-SLR

Chinese simplification

2017 2018 2019 2020 2021

GTB introducet 1st proposal to IWG-SLR

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12-2019 draft for approval

DEADLINE GRE 04/2020
Formal Submission to 11/2020 WP29

Mid-2021 Entry into force

03-2019 draft for approval

GTB 1st proposal to IWG-SLR
Challenges:
- How to keep UN and China synchronised
  (Assuming China will not join the UN 1958 agreement)
- How to define an approach acceptable to the USA

Solution:
- Start working on GTR’s for M1 and N1 vehicles as Stage 3 of the Simplification agenda
  - Installation
  - Road Illumination Devices (RID)
  - Light-Signalling Devices (LSD)
  - Retro-Reflective Devices (RRD)
• How to manage regulation of simple devices and vehicle systems?
  ➢ Existing regulations satisfy current technologies
  ➢ Difficulty to define vehicle level performance based requirements for individual devices

• The Priority is to develop performance based technical requirements to encourage innovation

• **Should Stage 2 Simplification focus upon Adaptive systems as a first priority?**
December 2016  GTB proposal
  • unique opportunity to develop globally harmonised technical requirements
  • offered its global expert resource to draft a first proposal for consideration by IWG-SLR in September 2017.
  • presented an initial idea to harmonise UN and Chinese GB requirements.

January 2017  Driving Vision News Regulatory Workshop in USA. Positive response from NHTSA

February 2017  GTB New Technology Forum and one day Brainstorm on Stage 2

April 2017  GRE was informed of the outcome of the DVN workshops that show significant support for a new initiative to develop harmonised technical requirements
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2017</td>
<td>DVN Shanghai Workshop – Panel of 8 Chinese Stakeholders&lt;br&gt;Unanimous support for harmonisation under UN 1998 agreement.</td>
</tr>
<tr>
<td>April 2017</td>
<td>GTB meeting with Chinese Government – Standards Administration of China (SAC). Further meeting expected with MIIT in June.</td>
</tr>
<tr>
<td>May 2017</td>
<td>GTB Plenary session (Bologna Italy) – further development of a proposed approach. – further brainstorming.</td>
</tr>
<tr>
<td>June 2017</td>
<td>Meeting of the GTB RCNC Working Group in Tianjin, China&lt;br/Input from Chinese experts and the group developing the simplified GB standards</td>
</tr>
<tr>
<td>July 2017</td>
<td>GTB intermediate WG session (Karlsruhe) to prepare a submission for the IWG-SLR September 2017 session.</td>
</tr>
</tbody>
</table>
## Regulatory Hierarchy

### Level 1 - The legal act establishing the administrative requirements

<table>
<thead>
<tr>
<th>Examples:</th>
<th>Administrative Requirements COP / Markings / Mandatory functions / devices – Signalling – RID – Retro-Reflectors Rules for optional functions / devices (are they only allowed when included in a list?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(New UN “Top level” Regulation)?? UN R-0 (IWVTA) EU Framework Directive China GB / FMVSS108 / Etc........</td>
<td></td>
</tr>
</tbody>
</table>

### Level 2 - Technical Installation (Could become a GTR)

<table>
<thead>
<tr>
<th>Examples:</th>
<th>Technical Requirements – Installation Definitions On-Road Performance of the whole vehicle – Signalling / Forward Visibility / Glare to other road users. Position, apparent surface, Geometric Visibility, Headlamp aim -----</th>
</tr>
</thead>
<tbody>
<tr>
<td>R48 /R53 / R86 FMVSS108</td>
<td></td>
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</tbody>
</table>

### Level 3 - Technical Devices and systems (Could become a GTR)

<table>
<thead>
<tr>
<th>Examples:</th>
<th>Technical Requirements for Devices + Light Sources (Mandatory and Optional) and objective testing methods for each device or system. Photometry / Mechanical / Thermal / ------------------</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Regulations / SAE Jxxx / GB Standards etc.</td>
<td></td>
</tr>
</tbody>
</table>
Follow the disciplines associated with development of GTR’s

Fundamental analysis of the existing technical requirements

Define robust testing regimes
(suitable for self certification purposes and not dependent upon interpretations and judgement of the type approval authorities).

Cooperation with research institutes
The Path to UN GTR’s (UN1998 Agreement)

Stage 1: Simplified UN Regulations – No technical change
Stage 2: Introduce performance-based requirements for adaptive systems
Stage 3: Global Technical Regulations (GTR) – Performance Based

Timeline:
- 03/17: Stage 1
- 09/17: Stage 2
- 04/20: Stage 3
- 2023
The Path to UN GTR’s (UN1998 Agreement)

Simplification - No changes to the technical provisions
New Regulations for RID/LSD/RRD

Stage 1

03/17
09/17
01/19
04/20

2023
The Path to UN GTR’s (UN1998 Agreement)

Stage 2

- Revision of the New Regulations for RID/LSD/RRD
- Revision of R48
- Technical requirements for discrete devices
- Vehicle-Performance based technical requirements for vehicle systems
  - Alignment of UN and Chinese GB Standards
- Global Technical Regulations for Installation / RID / LSD / RRD
- Vehicle-Performance based technical requirements for discrete devices.
- Vehicle-Performance based technical requirements for vehicle systems
  ➤ Ongoing harmonisation of UN, China and USA
Advantages for China and USA to introduce the GTR’s alongside the existing Mandatory GB Standards and the US FMVSS108

Harmonisation of technical requirements without disturbing existing legislation.