COMMENT ON SLR-75-04
NEED FOR MEASURABLE PERCEPTUAL SURFACE AND CONCRETE PROPOSALS

Reference: SLR-75-04, SLR-74-05/Rev.1, SLR-72-02, SLR-72-19, SLR-73-03,

SLR-75-04 raises sensible questions about problem definition and safety. However, after 14 GTB task-force meetings SLR-75-04 again return to high-level questions instead of proposing measurable solutions.
The documents submitted over the past sessions show a significant and unexplained shift in GTB's position regarding the apparent surface issue.

- **SLR-72-02** introduced a clear problem statement and a technically sound direction for modernizing the surface definitions.
- **SLR-74-05/Rev.1**, submitted by GTB *in reaction to SLR-72-02*, acknowledged these problems and proposed a structure for simplification, although the effectiveness of that proposal was noticeably reduced compared to the original intent of SLR-72-02.

Now, with **SLR-75-04**, GTB suddenly questions whether there is any problem at all — after 14 task-force meetings. No technical evidence is provided to contradict GTB's earlier conclusions, and the document does not offer an alternative proposal, only questions.
We therefore interpret SLR-75-04 as a reflection of internal divergence within GTB rather than a resolution of the underlying problem.
The original safety and clarity concerns remain unaddressed, and SLR should request GTB — or other volunteering parties — to present a concrete, measurable proposal so we can assess impacts rather than relaunch the debate from zero. The SLR-72-02 should be treated as the base proposal to be eventually improved and detailed.

Rationale / technical background

- **Safety need:** Modern lamp designs (narrow LED strips, edge-lit guides, segmented arrays, big uniform areas of low luminance) have photometric properties that make intensity-only regulation unreliable in different ambient light conditions. Driver visibility (and glare avoidance) is governed by **luminance × area × contrast**, not intensity alone.
- **Regulatory gap:** Current "surfaces" definitions are geometric and example-based; they lack objective luminance/contrast criteria. Visual checks during type-approval do not reliably detect real-world visibility shortcomings.
- **Feasibility:** Luminance measurement methods and camera-based analysis are mature and already illustrated e.g. in SLR-54-08, SLR-72-19 and SLR-73-03. A luminance camera test is practical and reproducible.

Requested action for SLR

1. Ask GTB to provide, for the next SLR session, a **draft amendment text** that includes:
    - Definition: "Perceptual" **light-emitting surface** (PLES) based on luminance/contrast.
    - Annex: Measurement procedure (camera specs, background conditions, contrast rule).
    - Proposed min/max luminance values by function and proposed value (h_{max}) for internal heterogeneity.
2. If GTB cannot produce the draft, start working on an existing proposal (SLR-72-02) to fill the gap.
3. Perform the demonstration/ workshop for luminance camera measurements of different signalling lamps according SLR-72-02.

Continuing the debate without concrete text and test methods will prolong regulatory uncertainty and leave potential safety gaps unaddressed.

REGULATORY IMPACT ANALYSIS

Objective: Evaluate benefits (safety, results repeatability, removing the burden of ambiguous criteria and tests) and regulatory consequences of adopting a (new) PLES with luminance/contrast criteria in place of (old) "apparent, light emitting, and illuminating surface".

Option under analysis

Adopt PLES replacing existing tripartite surfaces; require:

- objective luminance/contrast measurement (day and night),
- minimum luminance by function for daytime visibility,
- maximum luminance by function for night glare control,
- limit on internal luminance heterogeneity (h_{max}).

Expected safety benefits

1. **Improved detection & recognition**
    - Drivers detect larger, higher-contrast signals faster. Psychophysical studies show detection threshold scales with contrast and area: increasing effective luminance/area improves detection distances and reduces reaction time — especially important for urban intersections and reversing manoeuvres.
    - Real-world benefit: fewer late recognitions in close-range encounters; reduction in collisions where signalling misinterpretation contributes.
2. **Reduced night-time glare incidents**
    - Maximum luminance limits reduce discomfort glare and veiling luminance for following drivers and vulnerable road users.
    - Benefit: improved night driving comfort and potentially reduced crash risk due to temporary visual impairment.
3. **Stable appearance across illumination conditions**
    - Contrast-based inclusion avoids "shifting" perceived boundaries; consistent recognition day/night reduces cognitive load and improves compliance (e.g., DI recognition).
4. **Objective, reproducible type-approval**
    - Less subjective visual inspection; fewer borderline approvals and less legal/technical dispute.

Regulatory & economic impacts

- **Design impact:** Some existing stylized designs may require redesign or higher/lower-output emitters to meet required luminance. Potential loss of certain styling features unless compensated by other design changes.
- **Market effects:** Possible short-term costs for re-engineering; long-term benefits include safer, more reliable signals.
- **Transitional approach:** Applying changes only to new type approvals mitigates burden on existing fleet and manufacturers.

Risk of inaction

- Continued allowance of designs that pass intensity tests but perform poorly in the field; potential incremental safety risks remain unaddressed.

How PLES + luminance rules address these

- Minimum luminance ensures strips and guides remain visible in daylight.
- Maximum luminance/glare limit prevents hotspot glare.
- h_{max} heterogeneity limit discourages large internal contrast ranges and blurred boundaries.
- Contrast-based inclusion makes boundary definition robust to ambient changes.