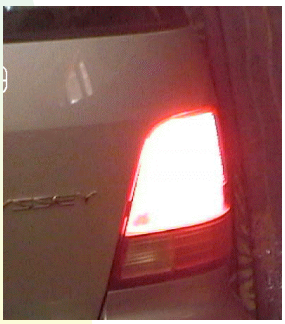

Assessment of Vehicle Lights by ANCAP

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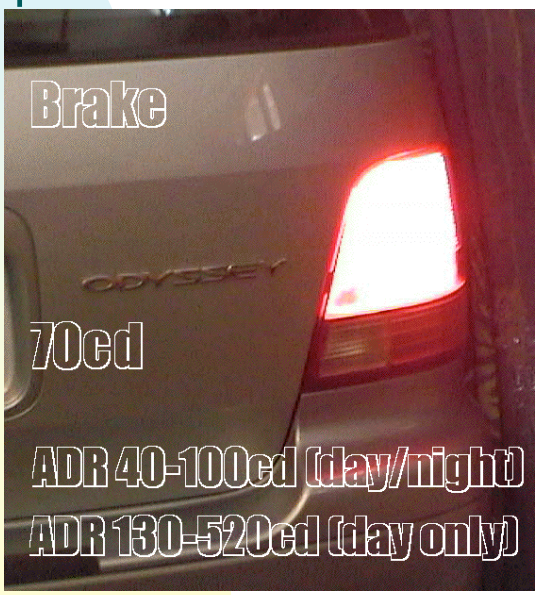
Vehicle Design and Research P/L

Purpose

- Prepare a draft protocol for the testing and assessment of vehicle lighting systems that will:
  - Encourage vehicle manufacturers to provide brake and turn signal lights with photometric performance near the top of the range permitted under the Australian Design Rules and
  - Encourage optional safety-related lighting features such as daytime running lights.

Lighting ADRs

- ADRs permit a large range in photometric performance for compulsory vehicle lights
- Most vehicles appear to have mid-range light performance



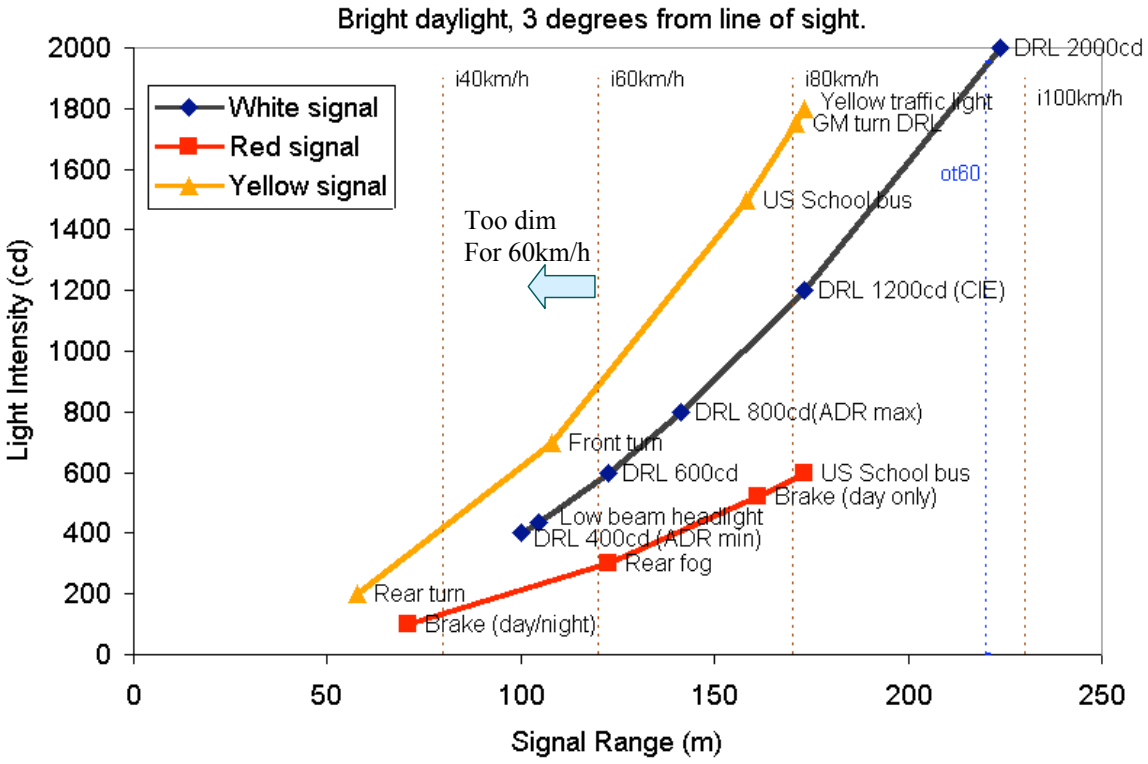
Road Design Sight Distances

Design Speed	Intersection Sight Distance	Overtaking Sight Distance
40km/h	80m	160m
60km/h	120m	220m
80km/h	170m	340m
100km/h	230m	480m

Visual Ergonomics

- Road design practices also give us an indication of the required intensity of various lights to achieve a given signal range - that is, the light is significantly more noticeable than the background
- Research conducted for traffic signals revealed:
  - Yellow lights needs 3 times the luminous intensity (candela) of red lights for the same signal range.
  - Range is proportional to √intensity
  - Range is inversely proportional to √background illumination, which can vary by 4 orders of magnitude - a light that is clearly seen at dusk might not be noticeable during a bright day
  - Angle from line of sight affects signal range

Signal Range of Vehicle Lights



Room for improvement

- Best performing brake light (520cd day only, 160m) has over three times the signal range of the worst performing light (40cd day/night, 50m).
- Best performing day/night brake light (100cd, 70m) has 50% greater signal range than the worst.
- With a 70m signal range, the brightest allowable day/night brake light is considered to be barely adequate on a bright day.
- Similar concerns apply to turn signals.

Scoring light performance

- Turn signals and brake lights could be tested by a recognised photometric lab. This non-destructive testing can be done in any city
- Score maximum points if near the maximum intensity permitted by the ADRs
- Zero points if near the lower limits
- Very simple and uses limits and test procedures prescribed in the ADRs

Possible bonus points

- Dual intensity turn signals and brake lights (as allowed by ADR)
- Automatic headlights (turn on when ambient light levels fall)
- Dedicated daytime running lights
- Headlight “on” alarms
- Cornering (adaptive) headlights
- US-style side marker lights

Recommendations

Consider a consumer rating (ANCAP) for vehicle lighting systems that

- Encourages dedicated DRLs
- Encourages better performing brake lights and turn signals (such as dual intensity lights linked to a sensor)