



## Motor vehicles: daytime running lights

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Author: Louise Butcher, Business and Transport

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There are two ways of illuminating vehicles during the day that have been under discussion within the EU for some years: the use of dipped-beam headlamps or dedicated daytime running lights (DRLs). DRLs are low-wattage lights which automatically activate when the engine is switched on. The current situation is that from early 2011 all new types of passenger car and light van will have to be fitted with DRLs. By summer 2012 buses and large/heavy vehicles will also have to be so fitted. This will apply only to new types of vehicle, not to vehicles already in use or to new vehicles built under existing type approvals. Motorcycles have been omitted from the DRL requirements.

This note gives an overview of what is being proposed and the evidence on which it is based; as well as the view of the UK Government and those opposed to DRLs. It also gives some information on how DRLs are used in other countries.

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### A. Introduction

There are two ways of illuminating vehicles during the day that have been under discussion within the EU for some years: the use of dipped-beam headlamps or dedicated daytime running lights (DRLs). DRLs are low-wattage lights which automatically activate when the engine is switched on. Each pair of DRLs fitted with filament lamps consume between 24 and 42 watts in total, but LED DRLs will consume less power and these are likely to become more prevalent in the future.

The EU-wide legislation on lighting comes from the Transport Division of the UN Economic Commission for Europe (UNECE), which provides a forum in which countries can negotiate agreements relating to transport policy.<sup>1</sup> Legal obligations are only placed on the UK when it ratifies the agreement and the agreement comes into force. The UK would then have to

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<sup>1</sup> <http://www.unece.org/trans/conventn/legalinst.html>

adopt national legislation to implement the terms of the agreement.<sup>2</sup> The UNECE Regulation that covers the installation of lights on vehicles is UNECE Regulation 48.

## B. European Commission proposal, 2006

In 2003, the European Commission (EC) commissioned a study on the costs and benefits of DRLs, which concluded that the use of DRL reduces the number of multi-party daytime car accidents by between five and 15 per cent.<sup>3</sup> In December 2005 the CARS 21 group reported to the EC.<sup>4</sup> In its report it recommended that “within a holistic, integrated approach involving vehicle technology, infrastructure and the road user”, DRL should be “included in the CARS 21 road safety roadmap”.<sup>5</sup>

Consequently, in August 2006, the EC published a consultation paper on DRLs. This stated:

This consultation seeks views on the mandatory use and the installation of automatic dedicated DRL on all motor vehicles (also trucks and buses, mobile machinery, small four-wheeled vehicles, tractors, etc.) in circulation on EU roads. Research indicates that such a measure could make a significant contribution to reaching the target of a 50% reduction in road traffic fatalities in the EU in 2010 compared to 2001. With a general introduction of DRL, it is estimated that between 1.200 and 2.00 lives could be saved per year in the European Union. DRL has its strongest reduction potential in multi-vehicle accidents with cars and in accidents involving cars and bicyclists.<sup>6</sup>

The Commission received responses from national governments, industry and users. The UK Government stated in its response that it had “examined the Commission's research and conclude that the benefits of DRL are far less certain than predicted. Furthermore the cost/benefit analysis is more likely to be less than 1, i.e. there is a negative cost/benefit ratio when more realistic assumptions are made”.<sup>7</sup> This conclusion was based on a review commissioned by the UK Department for Transport that indicated that mandatory use of DRL would provide a net accident reduction of between 3.9 and 5.9 per cent. In summary, the review reached the following conclusions:

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<sup>2</sup> the UNECE website contains a table of all the UNECE transport agreements and lists whether each country has ratified the agreement: [http://www.unece.org/trans/conventn/agree\\_e.pdf](http://www.unece.org/trans/conventn/agree_e.pdf)

<sup>3</sup> TNO Human Factors, *Daytime Running Lights: Final Report*, October 2003: [http://europa.eu.int/comm/transport/road/publications/projectfiles/drl\\_en.htm](http://europa.eu.int/comm/transport/road/publications/projectfiles/drl_en.htm)

<sup>4</sup> in January 2005 a high level group was set up to oversee a “Competitive Automotive Regulatory System for the 21st Century – CARS 21”, under the chairmanship of EC Vice-President Verheugen; the group consisted of prominent representatives of the EU car sector, Member States, the European Parliament, Trade Unions, NGO's, users and the Commission: <http://ec.europa.eu/enterprise/automotive/pagesbackground/competitiveness/cars21.htm>

<sup>5</sup> CARS 21, *A Competitive Automotive Regulatory System for the 21st century: Final Report*, 12 December 2005, p33 (recommendation 12): <http://ec.europa.eu/enterprise/automotive/pagesbackground/competitiveness/cars21finalreport.pdf>

<sup>6</sup> EC, *Saving lives with daytime running lights (DRL): a consultation paper*, 1 August 2006, para 1: [http://ec.europa.eu/transport/roadsafety\\_library/consultations/consultation\\_paper\\_drl\\_20060727.pdf](http://ec.europa.eu/transport/roadsafety_library/consultations/consultation_paper_drl_20060727.pdf)

<sup>7</sup> DfT, *UK response to 'Saving lives with daytime running lights (DRL)'*, 16 November 2006: [http://ec.europa.eu/transport/roadsafety\\_library/consultations/drl\\_20060727/drl\\_united\\_kingdom\\_government.pdf](http://ec.europa.eu/transport/roadsafety_library/consultations/drl_20060727/drl_united_kingdom_government.pdf)

There is substantial evidence that the mandatory use of DRL would provide a net accident reduction. However, the evidence concerning the magnitude of the effect and particularly the relationship with accident severity is considerably weaker.

The estimates of the fuel and emissions increases as a result of implementing DRL are reasonable and possibly slightly conservative (high).

The research into the potential of DRL on cars to impair the conspicuity of motorcyclists and other vulnerable road users was well controlled but limited in scope and did not consider some important variables. However, some consistent conclusions could be drawn which were that it should be possible to design dedicated DRL of low intensity (e.g. about 200cd) that are beneficial to the conspicuity of cars without adversely affecting the conspicuity of motorcyclists. However, DRL of higher intensity (potentially including standard passing beam headlights) could have an adverse effect on motorcyclist conspicuity in some circumstances.

There is considerable scientific uncertainty inherent in the values of the benefit to cost ratios presented in the EC work. The key variable is the assumption that the accident benefits would be considerably greater for fatal accidents (15%) than for serious (10%) or slight (5%) accidents. This assumption was very weakly supported by the available data and changing it to a more technically defensible assumption that the mean effect of 5.9% remained the same for all accident severities reduced the benefit to cost ratios to much less than 1 indicating that the costs would be greater than the benefits.

It was considered that it would be more technically valid to present a range of possible benefit to cost ratios within which there could be confidence that the true answer would lie, thus reflecting the technical uncertainty. The analysis showed that a ratio of 1 would fall within this range meaning that, although an accident reduction potential exists, it is not possible to say with certainty whether the benefits of implementing DRL would outweigh the costs.<sup>8</sup>

In its response to the EC, the Federation of British Historic Vehicle Clubs stated:

We suggest that the studies that show no adverse effect for unilluminated road users have been undertaken in conditions where the use of larger unlit vehicles is so small as to be insignificant. That is not the case in UK where there is a small, but significant, usage of older vehicles for hobby purposes representing approximately 0.1% of total circulation.

Our concern is that drivers will expect all vehicles to be lit and relate their instantaneous assessment of traffic conditions to lights rather than shapes: this will pose especial danger at road junctions and roundabouts where drivers seeking to join traffic flow may miss an unlit vehicle approaching the junction because they see the lights of the vehicles following it: in other words, the expectation of lights will create a mental blind-spot.<sup>9</sup>

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<sup>8</sup> DfT, *Daytime running lamps executive summary*, 10 November 2006, and full report: TRL, *Daytime Running Lamps (DRL): A review of the reports from the European Commission* (PPR 170), 10 November 2006, available at: <http://www.dft.gov.uk/pgr/roads/vehicles/vssafety/drls/>

<sup>9</sup> FBHVC, *Saving lives with daytime running lights (DRL): consultation response*, 10 November 2006: [http://ec.europa.eu/transport/roadsafety\\_library/consultations/drl\\_20060727/drl\\_fbhvc.pdf](http://ec.europa.eu/transport/roadsafety_library/consultations/drl_20060727/drl_fbhvc.pdf)

The Road Haulage Association said:

With the continuing pressures being imposed on the Heavy Transport Industry to improve the environment, reduce emissions and improve fuel consumption we feel that compulsory DRL would have unforeseen adverse consequences. By our calculations fuel consumption and CO2 emissions would increase by up to 1.5 %.

The RHA is not in favour of any of the options under consideration. The reasonable and bureaucratically less burdensome alternative would be to allow DRL on a country by country basis, as now, taking into account daylight, traffic density among other things. That Option does not seem to have been even considered. Finally, we are wary of so called road safety options where manufacturers gain and the expense of their customers.<sup>10</sup>

The Federation of European Motorcyclists' Associations (FEMA) said:

Because of the very different situations and conditions in the member states, with no existing viable alternative for motorcycle conspicuity, the recognized environmental cost, FEMA currently opposes the harmonization of DRL at EU level. DRL should be left to the appreciation of National governments, in accordance with motorcyclists and other Vulnerable Road Users' associations.<sup>11</sup>

The Royal Society for the Prevention of Accidents (RoSPA) said:

There is now a large amount of research available that makes a strong argument for the safety benefits of Daytime Running Lights. However, RoSPA does not believe that we are in a position to introduce their widespread use across the EU without more detailed research about how to minimise the risks to vulnerable road users or further consideration of the most practical and acceptable way to implement them.<sup>12</sup>

## **C. Where things stand, 2008**

Amendments have been agreed to UNECE Regulation 48 that will mandate the fitting of dedicated DRLs. Previously their fitment was optional. From early 2011 all new types of passenger car and light van will have to be fitted with DRLs. By summer 2012 buses and large/heavy vehicles will also have to be so fitted. This will apply only to new types of vehicle, not to vehicles already in use or to new vehicles built under existing type approvals. Motorcycles have been omitted from the DRL requirements. There are two documents that amend the UNECE Regulation 48 to mandate the fitment of DRL, the second of which makes only minor changes to introduce some special exemptions for Japan.<sup>13</sup>

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<sup>10</sup> RHA, *Daytime running lights (DRL)*, 16 November 2006:

[http://ec.europa.eu/transport/roadsafety\\_library/consultations/drl\\_20060727/drl\\_road\\_haulage\\_association.pdf](http://ec.europa.eu/transport/roadsafety_library/consultations/drl_20060727/drl_road_haulage_association.pdf)

<sup>11</sup> FEMA, *Saving [car drivers] lives with daytime running lights: Consultation Paper*, November 2006, p20:

[http://ec.europa.eu/transport/roadsafety\\_library/consultations/drl\\_20060727/drl\\_fema.pdf](http://ec.europa.eu/transport/roadsafety_library/consultations/drl_20060727/drl_fema.pdf)

<sup>12</sup> RoSPA, *Response to the EC consultation Saving lives with daytime running lights (DRL)*, November 2006:

[http://ec.europa.eu/transport/roadsafety\\_library/consultations/drl\\_20060727/drl\\_rospa.pdf](http://ec.europa.eu/transport/roadsafety_library/consultations/drl_20060727/drl_rospa.pdf)

<sup>13</sup> ECE/TRANS/WP.29/2006/88: <http://www.unece.org/trans/doc/2006/wp29/ECE-TRANS-WP29-2006-88e.pdf>; a copy of the Regulation as it stands is also available: <http://www.unece.org/trans/main/wp29/wp29regs41-60.html>

The proposals were adopted in November 2007. Transitional provisions contained within the amendments mean that the requirements will become mandatory for new vehicle types approved after early 2011. It is assumed that vehicles approved before this date without DRL may continue to be sold after 2011. The European Commission confirmed in September 2008 that the relevant EU Directive would be amended to bring it into line with the UNECE standards from 2011.<sup>14</sup>

The Government states that it has, however, been successful in “arguing against the introduction of mandatory use of dipped headlamps during daylight hours by drivers of existing vehicles”.<sup>15</sup> This was something that the Commission had been pushing for separately, and would require drivers of vehicles without DRL fitted as standard to turn on their headlights during the day. Opponents of such a scheme, including the Government, usually cite several reasons for opposing the mandatory use of dipped headlamps, such as:

- It would increase fuel consumption and vehicle emissions;
- It would lead to many more headlamp failures;
- It could reduce the conspicuity effect of motorcyclists' voluntary use of dipped headlamps during the day; and
- It could diminish the conspicuity of other vulnerable road users in general, such as cyclists and pedestrians.

The same concerns exist for mandatory DRLs although the increases in fuel consumption and emissions would be lower given that they consume less power. The problem of increased headlamp failures would not apply.

## D. DRLs abroad

Many EU countries already use DRLs. The 2006 EC consultation paper gave an overview of the situation in the EU and further afield:

In countries that already have DRL legislation, it was found that the opposition against DRL greatly subsided and that acceptance levels were generally high after its implementation. This can be said of experiences in Denmark, Sweden, Norway and Canada.

For the time being, **Canada** is the only country requiring the installation of DRL as mandatory equipment in all vehicles. A Canadian study comparing 1990 model year vehicles (the first ones to be required to have DRLs) with 1989 vehicles estimated a **statistically significant 11% reduction** in daytime multiple-vehicle crashes other than rear end impacts.

Other countries, such as Austria, the Czech Republic, Denmark, Hungary, Italy, Finland and Sweden, as well as Norway and Israel ask the drivers of vehicles to turn on their headlights during the day time, The situation is as followed for the EU Member States concerned:

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<sup>14</sup> EC press notice, “Daytime Running Lights for all new vehicles from 2011 to increase road safety”, 24 September 2008

<sup>15</sup> HC Deb 4 February 2008, c788W

Country	DRL where?	DRL when?
Denmark	All roads	All year
Estonia	All roads	All year
Finland	All roads	All year
Italy	M'ways & out of urban roads	All year
Latvia	All roads	All year
Lithuania	All roads	November-March
Austria	All roads	All year
Poland	All roads	October-February
Portugal	Indicated roads	All year
Sweden	All roads	All year
Slovakia	All roads	October-March
Slovenia	All roads	All year
Czech Republic	All roads	All year
Hungary	Out-of-urban roads	All year

Furthermore, some Member States recommend the use of light during daylight without mandating them while waiting for harmonised European legislation.

It can be said that **non-binding recommendations on DRL have only a mixed success**. A case in point is **France**. A French report of the year 2000 concluded that the implementation strategy with the largest acceptance level in France would be a technical measure, where dedicated DRL with an intensity somewhere between dipped headlights and parking lights are switched on and off automatically. The Dutch authorities also favour dedicated DRL, and consider the light sensitive switch for dipped headlights to be a sensible option.<sup>16</sup>

An August 2005 article in *New Scientist* gave more details:

DRLs were first made compulsory in Finland in 1972, and have since become law in a handful of other countries, including Canada, Denmark, Hungary, Iceland, Norway and Sweden. For much of the 1980s and 1990s imported Volvos and Saabs were all that most of the rest of the world saw of daytime running lights, but the trend has started to move south.

Now the laws in comparatively bright nations such as Italy and Israel require daytime running lights in certain weather conditions. Dipped lights are recommended in Sweden and Australia, and the French government advises drivers to use them on motorways. Even in Spain, Germany, Japan and the UK, where governments have so far held back on legislation, an increasing number of car manufacturers are offering DRLs as standard or as an optional extra on their flashier models.

A similar trend is developing in the US. To harmonise with Canadian regulations, and to create a single national law, the US National Highway Traffic Safety Administration (NHTSA) legalised DRLs in 1993, prompting General Motors to start hard-wiring them into new cars in 1997. Lexus, Mitsubishi, Volkswagen, Suzuki and Subaru soon followed, with most other manufacturers offering them as an option. DRLs even bring insurance discounts, making them increasingly popular with drivers. DaDRL president

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<sup>16</sup> Op cit., *Saving lives with daytime running lights (DRL): a consultation paper*, para 2.2 [emphasis in original]

Barry Bordonaro estimates that they are used by 30 to 50 per cent of American drivers.<sup>17</sup>

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<sup>17</sup> "Turned off by daytime driving lights", *New Scientist*, 6 August 2005