CTC, the UK national cyclists' organisation
Response to the European Commission's Consultative paper:
Saving Lives with Daytime Running Lights

working for cycling

1 INTRODUCTION

CTC is the UK's national cyclists' organisation and was founded in 1878. CTC has 70,000 members and supporters, provides a range of information and legal services to cyclists, organises cycling events, and represents the interests of cyclists and cycling on issues of public policy.

CTC believes that cycling has a wide range of benefits in many different areas of policy. These include improved health, independent mobility for all (including children, older people, lower income groups etc) and local economic benefits (in urban and rural areas alike), as well as reductions in the adverse effects of motorised travel (e.g. congestion, road danger, pollutant and greenhouse gas emissions, noise, community severance and the spatial pressures for increased road and parking capacity in both urban and rural areas).

CTC campaigns for the promotion of cycling at national, regional and local level. Our interests cover not only the role of cycling in transport policy (including road safety, highway planning design, influencing travel behaviour, and integration with public transport), but also how cycling fits in with other areas of policy: health, environment, education, traffic law and enforcement, taxation, land-use planning and development, regeneration, countryside access and tourism.

CTC was instrumental in developing a new National Standard for Cycle Training which has now been adopted by the UK Government, and is now a key member of the Government-backed Cycle Training Reference Group. CTC also provides professional advice to local authorities in conjunction with Cycling England (the body set up by the UK Government to oversee the delivery of the National Cycling Strategy in England). CTC is represented on the boards of Cycling England and Cycling Scotland, and has been a key player in shaping the Walking and Cycling Action Plans for both England and Wales. More recently it provided important input to recent UK Government White Papers on Public Health and Physical Activity. CTC is represented on the UK Government's Road Safety Advisory Panel and the National Road User Committee of the Highways Agency.

At a European level, CTC is a member of the European Cyclists' Federation (ECF) which represents half a million cyclists across Europe.

2. SUMMARY OF CTC's RESPONSE

CTC is opposed to the European Commission's proposals to make Daytime Running Lights compulsory for all motor vehicles at all times. We would be particularly concerned by any proposals involving the use of low beam (rather than dedicated DRL) lights, either as a permanent state of affairs, or as the temporary consequence of introducing blanket "behavioural" legislation to require the use of lights in daytime before the fitting of dedicated DRL is widespread. We would not oppose the use of low-powered DRL lights if controlled by a light sensor. However, our concerns over any proposal for a blanket requirement to use DRL in daytime are as follows:

- The use of DRL is likely to be detrimental to cyclists' safety by increasing the chances of drivers failing either to "see" or to "notice" cyclists. This could occur either because light sources (such as headlights) cause visual darkening in the area around them (i.e. cyclists, or indeed pedestrians, could be "masked" by lights behind them), or because the widespread presence of lights would divert drivers' attention away from other visual information (e.g. the presence of a pedestrian or cyclist), or because drivers become increasingly accustomed to the habit of looking for "lights" (rather than "people" or "vehicles") to signify the presence of a hazard on the road.
- The ensuing increase in the risks faced by (pedestrians and) cyclists could undermine efforts to encourage increased (walking and) cycling, thus having significant disbenefits in terms of wider health, environmental and other social objectives.

- Moreover, the additional energy required for DRL would significantly increase fuel consumption and hence greenhouse emissions from transport, at a time of mounting evidence of the urgency with which we need to take serious action to avert runaway climate change.

We do not accept the EC's evidence suggesting that DRL would be beneficial overall, and without any disbenefits to cyclists or other vulnerable road users. An experiment conducted for the EC to test whether (and how quickly) drivers can spot pedestrians, cyclists and motorcyclists in photographs of cars with DRL is in no way indicative either of what would happen with real (as opposed to photographed) light, or what would happen under real driving conditions (where drivers' attention is not specifically focussed on looking out for vulnerable road users). Other safety evidence gathered by the EC is weak and inconsistent, and overlooks key issues such as whether the adverse effects of DRL on cyclists might happen gradually rather than suddenly, or whether those effects might be more serious (and yet statistically harder to detect) in countries with low cycle use. The EC's cost-benefit estimates for DRL are skewed by an indefensibly high estimate of the claimed benefits of DRL on fatal collisions, and an out-of-date (1996) estimate of the costs of society of emitting greenhouse gases. Nor do they make any allowance for reductions in (walking and) cycling levels and the resulting loss of their health, environmental and other benefits.

These points are considered more fully in the following section.

3. CONSIDERATION OF THE EVIDENCE

3.1 summary of the EU case for DRL

The European Commission proposal rests on a series of four studies, summarised in a final report[1], as follows:

- *Interim Report 1* (IR1[2]) describes the different types of measure, which have either been taken or considered, for introducing DRL in different countries. DRL could be implemented by "technical" measures, i.e. by means of a mechanism to switch on the vehicle's lights automatically at the same time as the engine (n.b. the lights in question could either be the existing dipped headlights or a lower power dedicated DRL light, and there is also the option to switch on the lights only when poor light is detected by a light sensor). Alternatively DRL could be introduced as a "behavioural" measure – this could mean either laws or awareness campaigns to persuade drivers to switch on their lights (n.b. such laws or campaigns could apply to all roads or to rural roads only, and to all times of year or to the winter only). "Behavioural" and "technical" measures could be combined, e.g. by passing a law requiring new vehicles to be fitted with dedicated DRL before or at the same time as a law requiring drivers to use daytime running lights – the "technical" measure would obviously increase compliance with the "behavioural" measure.

- *Interim Report 2* (IR2[3]) comprises a meta-analysis of previous studies into the impacts of DRL on road safety. It concluded that, despite some studies with findings to the contrary, the balance of evidence suggested that DRL was beneficial to road safety, and was unlikely to have adverse effects on pedestrian, cyclist and motorcyclist safety. It also presented a cost-benefit analysis of 5 possible "implementation scenarios" for introducing DRL (see discussion under IR4 below). It concluded that the "behavioural only" measure of introducing a DRL law without requiring the fitting of dedicated DRL lights had the highest benefit:cost ratio. Its benefit:cost calculations rest on assumptions that, for injuries arising from daytime collisions excluding single-vehicle collisions (i.e. those where DRL is assumed to be beneficial), the mandatory use of DRL (without technical measures) would prevent 5% of slight injury collisions, 10% of serious injury collisions and 15% of fatal injury collisions. It also assumed that DRL would increase fuel consumption by 1.6% for small cars and 0.7% for lorries, aggregating to 1.35% for the vehicle fleet as a whole.

- *Interim Report 3* (IR3[4]) reports on an experiment, using slide photographs, to test whether particular types of road user (i.e. pedestrians, cyclists and motorcyclists) were less conspicuous when masked by daytime lights. It concluded that there was no such effect.

- *Interim report 4* (IR4[5]) weighed up the implementation scenarios discussed in the cost-benefit analysis from IR2, namely: (a) the "behaviour only" option of imposing a law requiring low-beam

headlights to be used in daytime; (b) the "behavioural plus low beam" option of a law requiring drivers to use low-beam headlights, plus a requirement for new vehicles to switch on low-beam headlights automatically when the engine is switched on; (c) the "behavioural plus dedicated DRL" option of a law requiring drivers to use low-beam headlights, plus a requirement for new vehicles to switch on a dedicated daytime running light (of lower intensity than normal low-beam headlights) when the engine is switched on; (d) the "technical low beam" option requiring all new vehicles to switch on low-beam headlights automatically at the same time as the engine, but without a law requiring the use of daytime lights where this is not automatically fitted; "(e) the technical dedicated DRL option where new vehicles would have a dedicated (lower intensity) DRL light fitted, again without a law requiring its use on other vehicles. It recommended that the "behavioural plus dedicated DRL" option should be the preferred option, arguing that DRL lights were preferable to dipped headlights in terms of greenhouse emissions and the risk of masking vulnerable road users, but that a law was needed so as not to delay the realisation of DRL's claimed safety benefits.

3.2. Reasons for concern over the effects of DRL on cyclists' safety

There are several mechanisms whereby drivers might become more prone to fail to notice cyclists:

- Drivers (e.g. those pulling out of side road turnings) may be less likely to spot a cyclist if they are "masked" by the glare from the front light of a vehicle behind them. The presence of a bright light also has the visual effect of darkening the area around the light, thus extending the area in which a cyclist is at increased risk of not being spotted by another driver.
- There is evidence that the human brain can only process a finite amount of visual information – even though a driver might "see" a cyclist (i.e. the cyclist is within their field of vision), they may fail to "notice" the cyclist. Cyclists all too frequently experience collisions and near-misses where the driver afterwards simply claims not to have seen the cyclist, even though the cyclist may have seen the driver looking straight in their direction just beforehand. This phenomenon, known to ophthalmologists as "inattentional blindness" (or "change blindness, or "inattentional amnesia" is likely to become more prevalent as drivers are confronted with increasing amounts of potentially confusing visual information (i.e. bright lights).
- There is also a risk that "inattentional blindness" could become more prevalent as drivers become accustomed to looking out for "lights" (rather than "people" or "vehicles") to signify the presence of a hazard on the road. This would increase the likelihood of them failing to spot a pedestrian or cyclist. This is a problem which could increase gradually over time (rather than necessarily being a sudden change), hence it could be difficult to detect statistically, even if though the problem itself might be very real indeed.

3.3. Reasons to doubt the EU's evidence of safety benefits from DRL

We are not at all reassured that our concerns are addressed by the evidence gathered by the European Commission in support of its efforts to introduce DRL, for the following reasons:

- The evidence considering the overall effects on road safety (summarised in IR2) contains contradictions and wide variations both of the overall effect, and of the effects on specific types or severities of collision. Estimates of the overall effect of DRL on daytime multi-vehicle collisions range from a 47% benefit to a 25% disbenefit. Of the 25 studies considered, 19 have overall estimates of a benefit of less than 15%, while 9 estimate the benefit as 5% or less, and 3 estimate it as zero or negative. Although the balance of evidence suggests a benefit, this is likely to be small at best, and a negative result cannot be ruled out. This is hardly a strong basis on which to propose compulsion, given the potential disbenefits due to worsened pedestrian and cycle safety (and the resulting reductions in the environmental, health and safety benefits which would ensue) and the consequent increase in greenhouse emissions.
- The claim in IR2 that the compulsory use of DRL "is more likely to reduce the number of accidents involving pedestrians or cyclists than to increase the number of such accidents" rests on even weaker evidence. As regards pedestrians, IR2 includes 9 studies providing aggregate estimates of the impact of DRL on pedestrian safety – 5 of these estimate disbenefits whilst only four of them indicate benefits. As for cyclists, IR2 includes only 3 studies which estimate the effects of

DRL on their safety. Two of them ([6] and [7]) use overlapping data from Denmark, suggesting benefits of 2% and 4% respectively, whilst only one, a study from Sweden[8] which has attracted much criticism[9] [10] [11], suggests a significant benefit (11%). The authors of IR2 seem to assume that DRL enables cyclists to spot motor vehicles more easily (indeed they make this assumption explicitly for pedestrian safety), and that this benefit outweighs any disbenefit due to drivers being less able to see (or less likely to notice) a cyclist. However, Transport for London casualty data for 2003[12] show that the most common factor in cyclists' collisions in Greater London was that a vehicle 'Disobeyed Stop or Give Way sign or marking', yet the cyclist was only to blame in 2% of these cases. In other words, drivers failing to see (or to notice) cyclists would appear to be a much greater problem than cyclists failing to notice motor vehicles.

- No evidence is presented as to what effect DRL has on serious and fatal cycle injuries (nor indeed for pedestrian injuries). Hence it is entirely plausible that, even if DRL were to have marginal benefits for less serious cyclist injuries, it could still be harmful to more serious and fatal injuries, e.g. if these were more likely to result from drivers failing to notice cyclists rather than vice versa.

- The pro-DRL findings of several of the studies in IR2 (including the Swedish study mentioned above) have themselves been contested. For instance, the safety benefits claimed in one study of casualty trends following a DRL law in Finland[13] turned out to arise solely from a reduction in collisions with animals – upon scrutiny, it emerged that there was effectively no reduction for multi-vehicle or pedestrian collisions. There are also discrepancies between the findings of different studies of DRL. For instance, a previous EC-commissioned review of evidence on DRL[14] found that it has greater benefits in countries with higher latitudes (i.e. further from the equator), suggesting that it is most useful in lower levels of light. Yet IR2 disputes this finding. IR2 also fails to find any relationship between the scale of the benefit from DRL and the proportion of vehicles switching to using DRL (i.e. it fails to find a "dose-response" relationship). Such anomalies and contradictions do not inspire confidence in the findings in favour of DRL. A summary critique of past studies claiming safety benefits from DRL is was provided in a 2001 report[15] produced jointly by the European Cyclists' Federation in conjunction with the Federation of European Motorcyclists' Associations and the European Federation of Road Traffic Victims (FEVR).

- The experimental study of DRL's impacts on vulnerable road users (IR3) adopts a flawed methodology. Other studies ignored by IR3 (e.g. [16] and [17]) have reached very different conclusions. The IR3 experiment asked participants to spot pedestrians, cyclists and motorcyclists in slide photographs which also included cars using DRL. This exercise is unrealistic, not only because "real" light affects the eye differently from photographed light (due to the much higher presence of ultra-violet radiation), but also because, in real life, the attention of drivers is not focussed on the task of looking out for pedestrians, cyclists or motorcyclists, as is the case in this experiment. It therefore takes not account of the possibilities that DRL might exacerbate "inattentional blindness", whether due to the distraction from large numbers of lights in the drivers' field of vision, or due to drivers being increasingly accustomed to looking for "lights" (rather than people or vehicles) to signify a hazard on the road.

3.4. Issues not considered in the EU's evidence to support DRL

- The "before" and "after" research findings used to support DRL do not consider the possibility that the DRL might have adverse effects on vulnerable road users' safety that would not occur immediately, but over a longer period of time. For instance, drivers might only gradually acquire the habit to looking for "lights" (rather than "people" or "vehicles"). Indeed this might even be a generational effect, with learner drivers acquiring the habit of looking out for lights, in contrast to the habits of drivers of the pre-DRL generation. Although some studies have attempted to assess whether the overall claimed benefits of DRL are durable over time, none has considered the longer-term impacts of DRL specifically on the safety of pedestrians or cyclists.

- Another factor which the studies could not pick up is the possibility that the adverse impacts of DRL on cyclists' safety might be particularly acute in countries where cycle use is low. There is good evidence that cyclists (and indeed pedestrians) gain from "safety in numbers", i.e. cycling (and indeed walking) gets safer the more people there are cycling and walking[18]. The main explanatory factor is likely to be that drivers are better at noticing cyclists in places where they interact

frequently with cyclists, and conversely they are more prone to fail to spot cyclists where cycle use is low. Hence it is possible that, in countries with high cycle use, drivers (or at least a good proportion of the driving population) would retain the habit of looking out for cyclists, but in countries with low cycle use they would become increasingly prone to look out for "lights" (rather than people or vehicles). The resulting adverse impact on cyclists' safety might be very significant but still remain statistically undetectable, since quite large fluctuations in cycle casualty numbers (and particularly the numbers of serious and fatal casualties) can occur purely randomly.

- Finally, CTC has learnt in the past few days that there is now evidence (although we have not managed to obtain a reference for it) that the introduction of DRL in Austria has led to increased casualties, particularly for pedestrians using pedestrian crossing points[19].

3.5. Wider environmental, health and other issues

- DRL would have a detrimental effect on greenhouse gas emissions. For example DRL's on a Volvo require 170 watts of electrical power but when you take into account engine heat losses, mechanical losses, drive belt and alternator losses, they require about 970 watts of primary energy. This would lead to an extra 0.25kg of CO2/hr being released into the atmosphere, which would require a 0.5 -1.5% increase in the amount of fuel used. This would result in an extra 1.85 million tonnes of CO2 annually (at current car fleet levels) entering the atmosphere[20].

- Whilst we do not know what overall impact DRL would have on road casualties (due to the uncertainties of the evidence referred to in section 3.2 above), we would oppose it if it had an adverse impact on cycle (and/or pedestrian) safety, even if it had a net positive benefit on road casualties overall. If drivers were to become increasingly prone to fail to notice (pedestrians and) cyclists, such that the risk of travel by these modes increased, this would increasingly deter people from walking and cycling (or, in the case of parents, from allowing their children to walk and cycle). This in turn would have adverse effects on the efforts of the Commission, of national governments and others to tackle air quality and climate change, heart disease and obesity, road congestion, transport-related social exclusion etc. None of these effects is included in the cost-benefit assessment presented in IR2.

3.6. Comments on the EC's cost-benefit analysis and implementation scenarios

- The cost-benefit analysis presented in IR2 rests on the assumption that DRL would reduce fatal injuries from multi-vehicle daytime collisions by 15%, even though IR2 itself acknowledges that there is insufficient data to produce a reliable estimate of the impact of DRL on fatalities. A review of IR2 for the UK Government[21] found that an estimate in the range 5.0-5.9% would be far more defensible. It also found that there was a good deal of uncertainty over the cost-benefit figures more generally. It found that the use of a lower estimate of the effect of DRL on fatal collisions would reduce the estimated benefit:cost ratios for the different implementation scenarios to the point where they would be about as likely to be negative as positive.

- Another point, not picked up in the UK Government's review of the EC's evidence, is that IR2 uses an out-of-date estimate (from 1996) of the monetary value of the cost to society from emitting greenhouse gases. We believe a much greater value should be placed on this quantity, in the light of recent evidence[22] [23] [24] emphasising the urgency with which we need to tackle the problem of runaway climate change. This would undermine the estimated benefit:cost ratios still further.

- The cost-benefit analysis also makes no allowance for the loss of health, environmental and other benefits of walking and cycling which would occur if DRL were to increase the risks faced by pedestrians and cyclists, leading to a reduction in walking and cycling activity.

- We are particularly concerned that IR4 comes out in favour of an immediate law to the use of front lights during daytime (as well as a law requiring dedicated DRL to be fitted in all new motor vehicles). Whilst we agree that dedicated DRL is less harmful than low-beam headlights – both in terms of the likely adverse effects on cyclists' safety and in terms of climate emissions – we would be very concerned at the sudden introduction of laws requiring vehicles to use daytime lights. We note IR4's reasoning for preferring an immediate law is that the alternative of delaying the compulsory use of lights in daytime "is not very attractive since it would involve

an unnecessary delay in the expected road safety benefits of DRL usage." Our perspective is very different – we fear that the sudden increase in the number of lights on the roads would be the most likely to have serious adverse impacts on cyclists' safety, particularly if this law were to come into effect before the fitting of dedicated (lower power) daytime running lights was widespread. It would also lead to much higher increases in greenhouse emissions if motor vehicles were required to use lights in daytime when the only option available to many drivers would be use dipped headlights, rather than a (lower-powered) dedicated DRL.

- Moreover, the use of behavioural measures (i.e. a law backed by "a large-scale publicity campaign on television, radio and in the newspapers) rather than purely technical measures is the approach most likely to result in "risk-compensation" (i.e. people driving less cautiously because they believe that their safety has improved), with resulting disbenefits for cyclists and other vulnerable road users. We draw attention to the parallels with the introduction of compulsory seat-belt-wearing: whatever the claimed overall safety benefits of this policy, there is evidence that it led to drivers driving less cautiously[25], and that it led to a marked increase in fatalities for pedestrians, cyclists and rear seat passengers (who were not subject to the new seat-belt laws). It is notable that cycle use in the UK went into long-term decline after 1984, the year after the introduction of compulsory seat-belt wearing, having grown steadily from the mid-1970s[26]. It is for this reason that we believe that, if DRL is to be introduced at all, great care should be taken in its implementation to avoid adverse effects on cyclists and other vulnerable road users, not only on road safety grounds but on health, environmental and other grounds as well. We would be totally opposed to its introduction through legislation (especially if it would lead to a sudden increase in DRL use from a low base), as this is the approach most likely to lead to significant "risk-compensation", as well as giving drivers little time to adjust to the extra visual information on the roads.
- With this in mind, we note that IR1 flags up the options of introducing DRL on rural roads only, in winter only, or under the control of light sensors to detect low lighting conditions. Yet these options are not given any consideration in IR2 or IR4. IR2 presents no data on the relative safety of DRL on rural versus urban roads, nor in winter compared with summer. Its cost-benefit analysis also omits any consideration of these options, or the option to use light-sensors to control DRL. We feel this option merits serious consideration for several reasons. It might be the optimal balance between maximising the benefits to drivers whilst minimising adverse effects on vulnerable users; it would reduce fuel consumption and greenhouse emissions from using DRL in bright conditions, and would mean that lights were not a permanent feature of drivers' view of the roads, thus reducing the likelihood of them becoming accustomed to looking out for lights rather than drivers. Moreover, as a "technical" rather than "behavioural" measure, it would reduce the risk of risk compensation by drivers to the detriment pedestrians' and cyclists' safety, and of efforts to maximise the environmental, health and other benefits of these modes.

4. CONCLUSION

We do not believe the evidence supporting the case for a law enforcing DRL is at all robust. There are flaws and inconsistencies both in the methodologies and conclusions of the relevant studies, and there are other issues not taken into account. We note that the evidence of the effect of DRL on cyclists' safety is weak, that there is a good deal of evidence that DRL is harmful to pedestrian safety, and that no data is available on serious or fatal cycle (or pedestrian) injuries. We are therefore not at all convinced that that DRL would not be harmful to cyclists' safety.

We are also are concerned at the increased energy required and the consequent environmental costs of such a law. This could be greatly reduced, and the risk of adverse effects on pedestrians and cyclists greatly diminished, by introducing DRL as a technical measure only (i.e. by requiring it to be fitted in new vehicles rather than by passing laws enforcing its use) controlled by light sensors.

There are other more important road safety issues to tackle, which could make our roads safer other than DRL. The EU recognise that excessive speed causes 15,000 fatalities and drink/drug driving a further 10,000 deaths. These surely are a far higher priority than DRL and yet the EU has no immediate plans to harmonise speed limits or blood alcohol limits.

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